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**Probing into Research through
Design: Understanding Design-led
Knowledge Production in HCI**

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PhD

2023

**Probing into Research through
Design: Understanding Design-led
Knowledge Production in HCI**

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of the requirements of the University
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Abstract

The research field of Human-computer Interaction (HCI) is concerned with technological design, which has the potential to impact society faster than any other design domain in unprecedented ways. As a result, HCI design researchers are increasingly urged to understand what they are dealing with much faster towards making design theory. However, the contemporary methodological and conceptual discussions often under-acknowledge the relationality and heterogeneity to the academisation of design and the situated nature of design-led knowledge production. This results in the partial inclusion of design in the field, as previously discussed by many.

In this qualitative case study, I aim to understand how ‘Cultural Probes’, often used as part of a ‘Research through Design’ approach, facilitate the politics of design research in HCI. While an increasing diversity of design-led research practices and design researcher identities can be found under these umbrella terms, they have been extensively debated respectively as a ‘method’ and ‘methodology’ since their first introduction to the field. I conducted a series of interview studies with design researchers who have worked with and published on Probes for their design-led research in HCI in order to understand the complexities of conducting and disseminating design-led research within the science-based research frameworks of HCI.

This thesis contributes to the ongoing definition and negotiation of design’s provisional disciplinary boundaries in HCI: It makes visible the enduring ‘research recognition gap’ in design, where dissemination is the locus of the (re-)production of design-led knowledge as in the case of Probes in HCI. Although Probes and similar design-led approaches to research are valued for facilitating criticality in design research, their ongoing methodisation aggravates this recognition gap. I further elaborate on the ways design research is attributed value to the extent it can be scientifically governed and made fit into the existing research frameworks of HCI.

The implications of this research recognition gap extend from disciplinary concerns onto impacting society through technological design. Hence, I present practical suggestions to alleviate the methodisation of Probes in HCI and to foster a culture of design and design research in academe. I approach design historiography from a practice perspective and engage in writing micro-histories for design research, HCI research, and my personal journey of becoming a design researcher. I encourage design researchers to further engage with this lens of ‘becoming a design researcher’ to emphasise the situated nature of design research beyond the limitations of disciplinarity. The outcomes of this research could also contribute to reframing some of HCI’s ongoing disciplinary problems by creating awareness around its status as a design field rather than a design-oriented one.

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Author's declaration

I declare that the work contained in this thesis has not been submitted for any other award and that it is all my own work. I also confirm that this work fully acknowledges opinions, ideas and contributions from the work of others.

Any ethical clearance for the research presented in this thesis has been approved. Approval has been sought on 27/03/2019 and 11/12/2020 granted by the Faculty Ethics Committee on 15/04/2019 and 11/12/2020 respectively.

I declare that the Word Count of this Thesis is 85,116 words.

Name: Sena Çerçi

Date: 27/11/2023

Chapter 1 – Introduction

1.1 Setting the context

This qualitative research is a case study into the value of design research; what it is and what it can do. It explores how the meanings of design and research have historically been negotiated from methodological and disciplinary perspectives. It surfaces how these are enacted within the contemporary contexts of design research through a series of interview studies with interaction design researchers working within the research field of Human-computer Interaction (HCI). Despite its concern for interaction design research, HCI has emerged as a domain of computing research with scientific origins. Hence, it sets an interesting case to explore how the meanings of design and research continue to be negotiated in academia.

In this section 1.1, I will be setting the context for the emergence of design specialisms, how and why they came to be. I will be contrasting this with the emergence of interaction design in HCI. In doing so, I will demonstrate how design and its potential for knowledge production has been perceived differently than in other design specialisms.

1.1.1 Defining design

What is design? At this stage of writing up a PhD thesis in design, I should be able to answer this question easily, yet I cannot. For example, am I inclined to understand and value ‘design as art’ (Murani, 2008) or at least, ‘treat design as art’ (Antonelli, 2007)? Maybe I need to think of design (as) research (Burdick, 2003), focusing on its capacity for knowledge rather than attributing an intrinsic value to design. On the other hand, is this capacity of design for knowledge bound by the existing configurations of research for/about/through/as design (Frayling, 1993; Jonas, 2014)? Perhaps it was deemed an ‘uncomfortable marriage’ between design and research (Glanville, 2014), because design wouldn’t stay loyal to research unless it was *on its own terms*.

Maybe I should start by thinking about what the designer does rather than the abstract concept of design? For example, do I think that designers steer ‘a ship without a rudder’ (Glanville, 1997; Glanville, 2014a) or engage in ‘drifting by intention’ (Krogh & Koskinen, 2020)? Maybe their agency extends onto ‘design as an attitude’ (Rawsthorn, 2018) beyond an externalised steering action? What if... if there can be ‘design without designers’ (Burdick, 2009; Raff & Melles, 2012), what becomes of the role of a designer? How might we even distinguish the designer when we are all designers (Papanek, 1971) or ‘becoming human by design’ (Fry, 2013)? Ah, this is too existential.

Perhaps I should follow the idea of designers materialising morality (Verbeek, 2006). Is it accurate to aggrandise designers as ‘Prometheus of the everyday’ (Manzini & Cullars, 1992)? Well, I don’t think it’s fair to designers that we overstate their agency and then urge them to be ‘a cautious Prometheus’ (Latour, 2008). There must be other ways to framing designers’ accountability... I don’t think design is merely a matter of letting designers cultivate this “garden of objects”¹ (Manzini & Cullars, 1992, p. 20). Even where we may be willing to let designers solve our problems for us, what should we expect of design? Can design save ‘the world’, as often emphasised in promoting design as a humanitarian endeavour (Keshavarz, 2016) or as part of the solution to the sustainability problems (Robbins, 2019)? Perhaps this sounds too ambitious for design, but we assume that this world is ‘the best of all possible worlds’² by design when we describe it as “changing existing situations into preferred ones” (Simon, 1996, p. 11).

¹ Manzini & Cullars (1992) note that our planet exists as the larger object in this garden.

² Although not explicitly stated, Manzini’s garden metaphor reminded me of Voltaire’s *Candide* first published in 1759. As an Enlightenment philosopher, Voltaire satirised the idea of Leibnizian optimism claiming that the world is “the best of all possible worlds” through the main characters’ relentless optimism. The story ended with a practical precept of “let us cultivate our garden”, which I think has similarities with design and its oft-attributed ‘critique of the existing’ and ‘taking action for the better’. The same optimism is also inherent in the ‘design will save the world’ rhetoric without much questioning around whose better and how we may determine the criteria to begin with.

There are issues and implicit assumptions with the way we keep talking highly of design in wishful thinking, yet undermine or aggrandise designers' agency to realise design. Do we even understand how designers actually work? Perhaps it is because we trust and value design for its capacity for such, but the designers not as much. Is that also why design research has been too serious a matter to be left to the designers since its early beginnings (section 2.2)? For example, they were observed and studied in order to distil a design methodology instead of being given the chance to speak up about their own practices throughout the first few decades of design research (e.g., Archer, 1968; Jones, 1970; Alexander, 1977; Lawson, 2006³; Cross, 1982; Schön 1987). Perhaps the answer lies in the way making and thinking have been alienated from each other in academic thought, as a result, preventing designers from becoming subjects of design research than its objects. Why is the relationship between design, designer and design research so complex and how do I begin exploring it?

As I exemplified above, defining or describing design is not a neutral act: It does not just translate a phenomenon into a concept, but also positions it. Defining design is ideological. So is not defining design: It has been argued that design's conceptual ambiguity is a strategy to cope with complexity (Redström, 2017). However, the vagueness of 'design' has historically necessitated a form of specification for its categorisation in order to fit it into the existing organisational structures, first within the division of labour in industry and then in academia. As I will explain in the following section, identifying and naming design specialisms such as graphic design, fashion design, or industrial design has historically helped gather a diverse profile of professional designers around these design practices. Hence, design specialisms were a means of organising and gathering rather than categorising and dividing design communities. On the other hand, when the division of labour increasingly demanded that these specialised designers were equipped with the relevant specific skills through their training, these specialisms were imported into the context of design education (section 2.1.1).

³ Lawson's book was first published in 1980.

Despite design research's initial existence across disciplines and domains, the design specialisms were then extended onto third-cycle education in design in order to protect the myth of disciplinary forms of knowledge (section 8.1).

1.1.2 Naming design

The technological developments have changed the world through design, but also design itself. Naming a design practice has functioned as an organising category throughout history in order to distinguish the professional practice from the non-professional ones. Naming simultaneously identified an emerging need and further organised these practices through their inclusion in design educational settings. Therefore, the scattered professional design practices would be transformed into a specialised domain, then a subject to be taught to further distinguish the professional from non-professional.

To put simply, naming a design practice facilitated the creation and maintenance of its boundaries. For example, the origins of graphic design is said to date back to antiquity or even prehistoric times, as far back as the early cave paintings from about 38,000 BC, but the first use of the term 'graphic design' appeared in a 1922 essay by the typographer William Addison Dwiggins. This marked a turning point from anyone being a designer to the identification of existing practices within a specialised domain to be made into a profession as a 'graphic designer'. Of course, this did not happen right away, but rather gradually and heterogeneously across the world. For example, Kelly argued that before the 1960s in America, graphic design "was more of a label than a profession" (2001, p. 3), but the inclusion of graphic design as a degree program at Yale University led to the contemporary profession as a 'graphic designer' in the American context. Similarly, the emergence of industrial design dates back to the industrial revolution in Great Britain in the mid-18th century. The earliest use of the term 'industrial design' appears sometime later in 1840. The first academic program of industrial design was established in 1934 at Carnegie Mellon University (Carnegie Institute of Technology back then) to yield 'industrial designers'.

1.1.3 Design for computing

Despite the other design specialisms emerging within the domain of design, 'interaction design' has emerged within the research field of Human-computer Interaction (HCI) in the mid-1980s. As in the other configurations of [x] design, the name may initially suggest that it is a design specialism. However, interaction design has always been positioned differently than the other domains of design since its emergence. First of all, unlike the other domains of design that emerged from professional practices to be gradually included in higher education, interaction design emerged from a research context and mostly remained within it. This, along with the changes academia went through to become more open to newer subjects and approaches until then, catalysed the conversion of 'interaction design' into an academic program. In contrast to the other design domain's longer waiting times for academisation mentioned above, interaction design did not wait for long and the first academic program of 'interaction design' was established at Carnegie Mellon University in 1994.

Secondly, interaction design did not signify a specialised domain of design as in graphic or industrial design — it was too abstract and general to specify a design domain to begin with. Indeed, interaction design did not emerge as a domain of design, but rather as a domain of computing. The advent of personal computing technology brought up an unprecedented need to design for human-computer interaction as of the 1960s. This gave rise to the research field of HCI in the 1980s to specifically tackle what would be named 'interaction design' later. The focus on interaction both in the research field of 'Human-computer Interaction' and the domain of 'interaction design' was to celebrate a particular moment in the history of computing research when engineer Douglas Engelbart and his team showcased a collection of technologies for seeing and manipulating data (Taylor, 2015).

Engelbart's demo was indeed an impactful moment in terms of research dissemination of artifacts that opened up a whole new way of thinking about the 'human factors' in computing as 'interaction design'. Perhaps because of the shortcomings of scientific approaches to study and design for the changing

nature of human-computer interactions moving from workplaces to personal settings at the time, interaction design research attracted researchers from a wide range of academic backgrounds into the research field of HCI, as well as those from the industry.

Hence, 'interaction design' has also become an organising concept within HCI, albeit different to how other domains of design were coined to distinguish the professional design practices from the non-professional ones. Instead, interaction design delineated an emerging approach to computing research. However, due to HCI's scientific origins, the 'design' in 'interaction design' remained somewhat scientific. Although the term was coined by two designers from industry research, Bill Moggridge and Bill Verplank, interaction design research in HCI had been dominated by scientific approaches to design and design research of engineering and technical disciplines. On that note, McCarthy and Wright wrote:

“HCI grew out of collaboration between the disciplines of computer science and psychology, the academic aspects of both of which are more comfortable with the laboratory than the outside world, and directed more toward functional accounts of computers and human activity than toward experience.” (2004, p. 6)

In many ways, the progression of interaction design research in HCI has been similar to the progression of early design research, moving from narrower, scientised accounts of design as a subject of study and functionalist paradigm to the incrementally pluralised design-led practices for research (see Chapter 2). However, because of its closer alignment to technical disciplines like computer science and software engineering, interaction design discourse remained mostly within the field of HCI. With few contact points in-between, interaction design research remained an isolated design research territory of its own from the rest of the conventional design practices and contemporary design discourse. Therefore, interaction design research in HCI managed to persist certain scientific ideals and understandings around design research that were also evident in the early beginnings of design research.

1.1.4 Design and designs in HCI

Design's inclusion in third-cycle education has helped dispel the scientific ideals around design to a certain extent. As a result, design has begun to be understood as a critically reflective and situated practice rather than in rationalised terms, moving away from the micro-politics of territorialising design (section 2.2.3). On the other hand, interaction design research in HCI has been holding on to scientific ideals for design due to its scientific origins and disciplinary identity crisis (see Chapter 3), often made implicit in the way design research has been discussed and governed in the field (see Chapter 7).

At first glance, HCI may seem to have become more familiar and more inclusive of these other approaches to design in its adoption of key terms and practices from the contemporary design discourse. For example, Frayling's term 'Research through Design' (section 2.3.1) and Dunne & Raby's 'Critical Design' have become increasingly popular in HCI (section 8.2.1). Similarly, Gaver et al.'s 'Cultural Probes' that have emerged as a designerly approach to research within HCI (section 3.2.3) maintain their popularity in the field. Therefore, interaction design research continues to attract more researchers from a diverse range of disciplinary backgrounds to engage in design research. However, in becoming aware of HCI's potential to shape the future digital technologies and impact society faster than any other design domain, design researchers are increasingly urged to understand what they are dealing with much faster.

At the heart of HCI's central concerns to interaction design research lies a desire to produce design theory. While the field previously focused on design artifacts as an end goal, it has shifted its focus to design theory for the transferability and generalisability of design knowledge and the scalability and applicability of design outcomes. This has been further triggered by the growing anxieties around justifying HCI research as the field has become increasingly aware of its methodological pluralism and diminishing relevance to the industry, which I will be discussing in Chapter 7 in detail. The field's

conceptual shortcomings in terms of disciplinarity and theory construction have been identified and named as the 'big hole' in HCI research by Kostakos (2015). It was later addressed by Reeves (2015) and Blackwell (2015), amongst many more proposing ways of rethinking HCI's disciplinary modes of knowledge production.

Similar concerns have been key to design research since its early beginnings across disciplines and different scales of design outcomes (section 2.2). However, because Interaction design research has its origins in computing research rather than in design, the two discourses of interaction design and design, did not have much organic contact. As the field of HCI became more aware of its ostensibly mutual concerns with design research, it has often turned to design discourse, albeit extractively (section 7.2), to potentially locate and fill its identified 'big hole'. This, in turn, has made design more aware of its own disciplinary problems that have been made implicit throughout its heterogeneous and stratified academisation (see Chapter 2). As I identified in this research, design has a porous sense of disciplinarity rather than none (section 7.1). This has attracted a plurality of approaches from diverse disciplinary backgrounds into interaction design research as an organising concept in HCI (section 4.1.2). When all design was put in the same research basket in HCI, but only *some* design was ill-fitting for its existing research frameworks and understandings of design in HCI, many of the issues and tensions that lead to the governance of design were made implicit in the research narratives within HCI. Some of these problems were indeed a result of a 'research recognition gap' in design (section 8.1) and the problems arising from dissemination (section 8.2), which I will address in Chapter 8 to suggest how the contributions of this research could inform future work to articulate the value of design research on its own terms.

1.2 Motivation

1.2.1 Forging an interaction design research methodology

I had my first contact with the term 'Research through Design' (RtD) upon my arrival into the HCI research community. Based on Frayling's (1993) ideas, the

term was used to describe “a model of interaction design research designed to benefit the HCI research and practice communities” (Zimmerman et al., 2007, p. 493). The authors acknowledged the increasing value of design practices for HCI research and wanted to expand the scope of interaction design research “to include *making* as a method of inquiry in order to address wicked problems” (Zimmerman, 2007, p. 496, emphasis mine). Throughout their paper, they emphasised that their goal was to equalise the attributed value of design research with the other disciplinary modes of knowledge production in HCI (Zimmerman et al., 2007). In a subsequent paper, Zimmerman et al. (2010) further argued for the formalisation of this research, fuelled with concerns around research prestige and the lack of evaluation criteria for interaction design research. They argued that “there is a need for serious development of RtD into a proper research methodology that can produce relevant and rigorous theory” (Zimmerman, 2010, p. 316).

I come from a design background without much formal training in research. This is the case for many researchers who arrive at the HCI research community from a design background. The lack of research-oriented training is often viewed as a shortcoming of design education (Meyer & Norman, 2020) in comparison to other research disciplines. As a newcomer to the field, the lessons I drew from these two papers by Zimmerman and his colleagues (Zimmerman et al., 2007; Zimmerman et al., 2010) were as follows: that design research lacked prestige in HCI and that it fell short on rigour. As they argued, this was especially the case for practice-based design research that engaged in making for knowledge production. It was how I had understood and practiced design research up until that point, having not yet familiarised myself with the beginnings of design research (section 2.2). Zimmerman and his colleagues were indeed trying to mitigate these problems by developing a practice-based methodology for interaction design research in HCI that can potentially lead to design theory. In the beginning, I couldn't grasp the underlying assumptions to theory-method relationship as a newcomer. However, in trying to rationalise the design research process, it entailed a scientific view of design despite its ostensible shift to design practice, which I will be discussing in section 7.3.

The nature of my original research proposal and my background situated me in close alignment to interaction design research, hence my engagement with the research field of HCI from a design school perspective. I had been aware of design's capability to generate knowledge throughout my previous training; however, the notion of academic research seemed to impose certain types of knowledge production that were at times incompatible with how I came to understand that design practices could generate knowledge. I was trying to figure out how design practice itself can become a mode of knowledge production rather than studying design from historical, philosophical, or cultural perspectives. The lack of a research framework for design was certainly an indicator that design research was much more dependent on implicit types of knowledge than its explicit and formalisable counterparts. Hence, design research may not always be particularly welcoming for newcomers (section 1.6).

On the other hand, Frayling's (1993) proposal seemed to mitigate these problems by identifying 3 different configurations to how art & design practices can relate to research as a starting point. Furthermore, it seemed especially popular in HCI as "a coherent quasi-scientific methodology to apply to 'practice-based', or as it is more commonly referred to now, 'practice-led' research" (Belcher, 2014, p. 235). Its "sound-bite quality" (Friedman, 2008, p. 157) conveyed the idea of grounding research in design practice to those that may not necessarily be familiar with academic design practices in such interdisciplinary contexts. So, I adopted it like many other design researchers in the field and was soon immersed in the contemporary methodological debate around RtD and its legitimacy for knowledge production in HCI. Given my initial frustration about lacking a starting point into design research, the expressed concerns often made sense for their desire to develop "protocols, descriptions, and guidelines for its processes, procedures, and activities" (Zimmerman et al., 2010, p. 317). As I've become more familiar with the HCI discourse, I have started recognising the underlying rhetoric to these concerns, which indeed stemmed from subjecting design to strictly scientific criteria for research assessment. Questioning RtD's research legitimacy would

ultimately result in further questioning of design's capacity for knowledge production and the value of design research, especially given its novice position in academia (Borgdorff, 2012). These meditations needed to include reflections on the kinds of knowledge design can produce and unpack the taken-for-granted meanings of disciplinary knowledge and academic research.

Design may be a relatively new research discipline with its beginnings in the 1960s, but design has existed as a vocation long before that with design practices predating the name. Since the anonymity of humble craftsmen, design has seen many names from the idealist social reformers to star designers⁴, it entered many contexts ranging from the creative studio to the governmental institutions, and it has taken many forms from the tangibility of product design to the abstract notion of interaction design. Design has evolved from a vocation into a profession, then a discipline, and a way of thinking, researching or even being⁵. It is said to exist in a constant 'unfinished' state and flux (Knorr-Cetina, 2001; Sanders, 2008). This has given design an ability to self-define through the relations to its contexts, while simultaneously being shaped through them (Brassett, 2015). I have previously explained how defining design is indeed taking a stance about it (section 1.1.1). I have further argued that naming design practices have transformed them into organising concepts (section 1.1.2). As a result, when the term RtD was introduced to HCI by Zimmerman and his colleagues, it also became an organising concept. It gathered a number of researchers who were interested in design research, hence it was widely appropriated by researchers of diverse backgrounds and expectations from design research in HCI. Despite the original intention to articulate the value of design research, the debate around RtD soon turned into a means of value creation by design research. It led to rather unrealistic

⁴ For example, Deyan Sudjic, the former director of the Design Museum in London and design critic, contrasts some well-known industrial designers like Raymond Loewy and Philippe Starck as "the contemporary version of the designer as celebrity, capable of transforming anonymous domestic objects with his signature" (Sudjic, 2009, p. 26), promising to "streamline the sales curve" (Sudjic, 2009, p. 23) on the side of business with the early designers who adopted a social mission like William Morris, who inspired the Arts and Crafts movement reacting against the industrialisation in the 19th century Britain.

⁵ For example, the ontological approaches to design like "Becoming Human by Design" by Tony Fry (2013) or the post-phenomenological approaches like "Design for Dasein" by Thomas Wendt (2015).

expectations that were quite similar to how design research was set out as a machine for problem-solving in early design research (section 2.2.2).

1.2.2 Consolidating design and design reactions

The debate around RtD in HCI is a perfect example to how design defines itself in its context. Originating in a 1993 proposal by Christopher Frayling of Royal College of Art, 'Research through Art & Design' was only one of the potential configurations of how art and design practice can relate to research along with its more theoretical counterparts as 'Research for Art & Design' and 'Research into Art & Design'. I will be further talking about the material history behind the term in section 2.3.1, but the proposal was in the form of a commentary⁶ rather than a research paper (Friedman, 2008). It was never meant to be a framework for research in art & design. Yet, due to a lack of better alternatives, Frayling's proposal was loosely adopted across art departments as "a coherent quasi-scientific methodology" (Belcher, 2014, p. 235). It was often strategically adopted for managing the 'incommensurability' of practice-led research with the academic expectations for research methodologies.

However, HCI's appropriation of RtD as a methodology-in-progress for interaction design research in isolation from its theoretical counterparts was alarming in some ways: It could have potential implications not only for design research but for the broader scope of practice-based research practices in art and design in terms of governance, as I will be discussing for design in HCI in Chapter 7. For example, proposals like Zimmerman et al.'s to formalise RtD as a "proper research methodology" (2010, p. 316) for interaction design research in HCI could become more than an organising concept but a category for design research in the longer term. Even though it is only one take on design research coming from a scientific design perspective, it could become a proxy for all design research and potentially determine what counts as

⁶ In fact, Friedman calls it "pamphlet" (2008, p. 153). He further claimed that the physical copies of the "small proposal" are difficult to find and that many people citing it haven't even read it (ibid.).

design research to be included in academia based on methodological compliance to the formalised RtD. To put simply, it would result in the “disciplinary consolidation” of design research beyond the HCI RtD community (Gaver, 2012, p. 945). The first ones to be excluded would be the already precariously-positioned arts and humanities oriented design research due to the difficulties in articulating their value to an outsider that indeed includes the funding bodies (Bate, 2011). Furthermore, the instrumental appropriation of RtD in HCI as a design-led approach to research without a consideration for its more theoretical counterparts as ‘Research for Design’ and ‘Research about Design’ (Frayling, 1993) could potentially aggravate the existing disconnect between those (Atkinson & Oppenheimer, 2016). The instrumental appropriation of design research was also identified by Margolin (2016) to distinguish ‘design studies research’ from the former.

As a result of its implications for the totality of research practices in art and design, the wide appropriation of RtD in HCI has rekindled the term’s influence and sparked further reactions. For example, Gaver (2012) published a paper titled “What should we expect from Research through Design?” in response to Zimmerman and his colleagues’ call for disciplinary consolidation around RtD, expressing his concerns about HCI’s underlying ‘scientism’⁷. In arguing that design research progresses through divergence rather than convergence in its methods and approaches, he further suggested thinking about the value of design research outside the scientific terms and “on its own terms” (Gaver, 2012, p. 945). Furthermore, the ‘Research Through Design’ Conference series was founded in 2013 by a group of design researchers to not only emphasise RtD as “a foundational concept for approaching inquiry through the *practice* of design” (Durrant et al., 2017, p. 3, emphasis in original), but also to “reclaim the vocabulary that fits us [designers]” (Frayling in Durrant et al., 2017, p. 4). As part of their reaction to the scientific modes of research and the appropriation of design-led approaches to research, Durrant et al. (2015) further explored new ways of disseminating practice-based design research

⁷ I will be elaborating on scientism and its overt and covert forms in HCI through this thesis, but see section 1.3.3 for a brief explanation of what it argues for.

that are more appropriate for the kinds of knowledge produced through design practice in these RTD conference series.

1.2.3 Valuing design for its style AND substance

Design and research have historically been conceived as conflicting endeavours within academia. Despite the emphasis on creativity in The Frascati Manual⁸'s definition of research (OECD, 2002, p.30), academic research is often expected to be systematic, rigorous, and repeatable rather than involve what's considered designerly qualities like creativity and imagination (Yee, 2017, p. 159). These kind of contrived dichotomies around design and research⁹ have kept design at bay as a "disciplinary outsider" (Clerke, 2012, p. 6), especially its practice-based forms. Design practices have been confronted with biases against design as mere styling rather than having the necessary rigour for knowledge production (see the footnote on 'Design Research Unit' in section 2.2.2).

Since the inclusion of practice-based design research in academia, these dichotomies have been generating and reinforcing the institutional and cultural obstacles that design researchers face when working within the constraints of academic research that have been historically shaped and dominated by the sciences (section 2.3.2). Yet, the harshest criticism came from within towards a change in design education to reinforce the existing bias around design (and crafts) as a superficial endeavour (Norman 2010; Norman, 2011). "Design needs more courses in substance, less in craft", said Don Norman (2011). Coming into design research from a cognitive science perspective, he has established the foundations for user-centred design and usability in interaction design research. As our understanding of 'user' was extended onto anyone who may be affected from a use without being a user, user-centred design has

⁸ The Frascati Manual is a document published by the Organisation for Economic Cooperation and Development (OECD). It sets out an internationally recognised methodology for collecting and analysing Research & Development statistics, determining the expenditure and evaluation criteria for all things higher education research in many countries, including the UK.

⁹ To name a few, theory/practice, general/particular, abstract/concrete, methodological/creative corresponding to research and design respectively.

been interchangeably used with 'human-centred design' to reflect that deepened, contextual understanding of use.

Yet, human-centred design has been criticised for reducing the immanence of both tacit and non-tacit forms of design knowledge into mere 'implications for design' (section 3.2.1 and section 8.2.1). On several occasions, Cockton referred to this approach as 'human-centred dogma' for fetishising empirical data about usage and contexts (Cockton, 2008; Cockton, 2012; Cockton, 2013; Cockton, 2014; Cockton, 2018). Along with some others like Greenberg & Buxton (2008), he further defended the subjective and imaginative in design against striving for the scientific ideals of universality and objectivity to ensure rigour in interaction design research. Controversially enough, Norman has also questioned the value of design research for innovation, stating that it is the "tinkerers of all sorts" that has driven innovation rather than the needs (Norman, 2010a, p. 40). Despite Norman's emphasis on the inseparability of theory and practice in design and critique of design education for the better, this kind of criticisms reinforce the biases against design that have kept design at bay in academia for decades.

Furthermore, HCI's diminishing relevance to industry practices has been a source of increasing anxiety for the field and design research was valued for the potential capacity to overcome this problem. It was first identified by Norman as 'the research-practice gap' (Norman, 2010b), where he maintained an implicitly scientific understanding of academic research, making contrived distinctions that were not appropriate for HCI design research. Perhaps this was amongst the reasons why there was a gap between HCI design research and the design practices in the industry. The irony was picked up by Frohlich & Sarvas, who sourced the lack of innovation originating in research to HCI research's existence in "something of a commercial vacuum" (Frohlich & Sarvas, 2011, p. 726) rather than putting the blame entirely on design research.

However, Norman had a point about the gap. It has been acknowledged that there was a gap between the research and industry practices, which was later

named 'theory-practice gap' and discussed extensively in HCI (Goodman et al., 2011; Remy et al., 2015; Beck & Ekbja, 2018). Therefore, HCI's growing interest in contemporary design research had an ulterior motive, too, and the value of design research indeed lied in its potential capacity for theorising, namely its 'substance'. Anything that fell outside this implicit 'functionalist' understanding of design research was to be deemed not useful (section 2.1.2 and section 7.4).

Nonetheless, the origins of interaction design research within the research context rather than industry have been under-acknowledged as a reason for its lack of relevance to the industry practitioners. Earlier, I've compared the emergence of interaction design research as a domain of computing research in comparison to the specialisation of design domains within the practice to be then included in the higher education and research context (section 1.1). It becomes clear from this perspective that interaction design research in HCI has adopted a top-down approach to overcome what it considers to be a problem. It further raises a question that has been made implicit not only in HCI research, but also throughout the heterogeneous academisation of design: What is it for? I will be exploring this question for design research and HCI research respectively in Chapter 2 & 3. For example, Fallman made a distinction between design-oriented research and research-oriented design in HCI (Fallman, 2003; Fallman, 2005; Fallman, 2007), then triangulated it as design practice-design studies-design exploration for interaction design research as a distinguished approach within HCI (Fallman, 2008). These exemplify how design seems to be one, but is many and even many more in the HCI research context in terms of how it is understood and practiced.

On the other hand, all of these issues and many more are made implicit in the notion of 'design research'. To an outsider or a newcomer, who may not always be able to distinguish the historical nuances to design research or read between the lines in the publications discussing these matters, these issues are not clear. Moreover, because the instrumental appropriation of RtD in HCI design research does not demand contributions to design studies, design research in HCI operates quite differently than practice-based design research

practices outside HCI. The value of design research is attributed to different aspects and discussed differently. However, criticism like Norman's potentially puts designers or researchers with design backgrounds under the spotlight rather than generating a more inclusive discussion around design research within and outside HCI.

When *all* design is put in the same basket of 'design research', but only *some* design gets criticised, some design researchers are made more vulnerable to 'disciplinary anxiety' (Fallman & Stolterman, 2010) in their broader range of contexts within academia, to which HCI is an example. Moving from the periphery to the core of academia on the 'unstable' disciplinary foundations of design (Julier et al., 2019), design researchers further lack a practice-based design theory or research framework in order to collectively defend their practices and demonstrate rigour to their research beyond individual means. Although this is a shortcoming only when thinking about design research in scientific terms rather than on its own terms; however, it continues to impact design's research prestige in academia. Moreover, it creates unanticipated challenges for design researchers where they need to operate as individual researchers within a diverse range of academic demands and expectations. Therefore, they often find ways to adapt and adjust themselves to the science-based research frameworks of HCI, making use of the existing theoretical frameworks and conceptual proposals despite their shortcomings. The desire to fit in and keep up with HCI research on one hand and to prove the true value of design research on the other remains an implicit aspect to becoming a design researcher within design's becoming (section 1.6).

Furthermore, the plurality of design practices that can be observed in the diverse approaches to design education are made implicit in 'design research'. Therefore, there is often an under-acknowledged effort to ensure the plurality of design research practices, especially those aligned closer with the arts and humanities (Rodgers et al., 2020). It's not difficult to see that HCI's scientific understanding of design research is much more suitable to these research assessment frameworks, which has the potential to not only dominate, but

subsume the plurality of design research through its appropriation of key design terms like 'Research through Design'.

The reality of why design lacks theory to come up with a better alternative to the use of RtD as a quasi-scientific methodology for practice-based design research in academia is much more complex than what's discussed in the contemporary methodological discussions surrounding RtD in HCI. Although it's probably impossible to clearly delineate and define a singular methodology for interaction design research in HCI in my opinion, a methodological and epistemological meditation on design research starts with the very same question asked in HCI to spark however different reactions: Can RtD be made into a methodology for interaction design research in HCI? On the other hand, the inseparability of theory and practice in design research necessitates grounding this meditation on a concrete case. In the next sections, I will be detailing how Probes in HCI enable 'probing' into RtD to further unpack the taken-for-granted aspects of disciplinarity and research dissemination in design research in HCI.

1.2.4 The metaphor of Probes in HCI

In their influential study of metaphors, Lakoff & Johnson (2008) argued that metaphor is much more than a matter of language and emphasised its conceptual features. They claimed its power lied in its 'imaginative rationality' that enabled interpretation where we can only have a partial understanding of something and further structure our experience and even partially guide future-action (ibid). When introducing their use of evocative artifacts in design research to elicit inspirational responses from people as 'Cultural Probes' to the HCI community, Gaver et al. (1999) not only embraced the ambiguity of the 'metaphor' of Probes, but furthered it with their explicit reference to both astronomic and surgical probes: Was culture an abyss of no known boundaries or a body of definite boundaries to be probed? How did the Probe returns inform the research process, apart from inspiring the final designs as stated?

Gaver and his collaborators could get away with this ontological and methodological ambiguity, because the dissemination of their Probes were not subject to academic research evaluation criteria of HCI: ‘Cultural Probes’ appeared for the first time in a non-conventional HCI venue, the ACM interactions magazine (Gaver et al., 1999). ACM interactions provided a rather ‘informal’ space to discuss contemporary matters of the field and share inspirations for future directions than disseminate research¹⁰. I will be talking more about the emergence of the Probes phenomena in HCI in more detail in section 3.2.3.

Once ‘Cultural Probes’ were out there with an air of mystery around them, they were widely appropriated in HCI for their ability to generate interesting insights into ‘everyday life’. The diversity of researcher identities and backgrounds in HCI sometimes resulted in partially pre-configured understandings of ‘Cultural Probes’ as something other than what they were meant to be. The metaphor of Probes was not unique to design and also existed in some other disciplines like engineering and social sciences, albeit the differences to the underlying approaches. Similarly, the use of artifacts and tasks like photography and structured diarising to engage people in research was not unique to design either, leading to the impression that Probes ‘repackaged’ some of these existing social science methods to cater “to an audience hungry to consume the next trend” in HCI (Graham et al., 2007, p. 35).

The variances in the uptake of ‘Cultural Probes’ as such have made them a kind of “Rorschach test, revealing their uptakers’ perspectives and preoccupations” in HCI as identified by Boehner et al. (2007, p. 1082). Indeed, these interpretations would often diverge from Gaver and his collaborators’ specific approach to develop into newer kinds of ‘Probes’ in HCI. This was

¹⁰ Gaver & Dunne also published a CHI paper titled “Projected Realities: conceptual design for cultural effect” (1999) on their use of ‘Cultural Probes’ in the same year the ACM interactions magazine article was published. The provocative manner to introducing Cultural Probes in the ACM interactions article is reflected in the significant difference to the citation counts of these two outputs.

particularly illustrated in the way Hutchinson et al. (2003) introduced their 'Technology Probes' with references to Probes from each discipline as such:

"Technology probes are simple, flexible, adaptable technologies with three *interdisciplinary* goals: the *social science* goal of understanding the needs and desires of users in a real-world setting, the *engineering* goal of field-testing the technology, and the *design* goal of inspiring users and researchers to think about new technologies." (Hutchinson et al., 2003, p. 17: emphasis mine)

Although sometimes referred to as such with different intentions and meanings attached to the use of the words 'method' and 'methodology'¹¹, 'Cultural Probes' were never intended to become a research method or methodology. Gaver and his collaborators were inspired by the radical ideas and concepts of 'The Situationists' in their conception of Probes as a 'critique of method' in HCI at the time that reduced people and their use contexts of technology to 'human factors' in design. For example, the acronym for the main HCI venue, CHI, stands for 'Conference on Human Factors in Computing Systems' as a reminder of this prevailing understanding. More specifically, 'Cultural Probes' aimed to open up new ways of thinking about user studies in HCI rather than preaching the 'human-centred dogma' and its strict empiricism (section 1.2.3).

As opposed to HCI's rigid and formal ways of conducting user studies like one-dimensional surveys in controlled settings back then, Gaver and his collaborators left the evocative Probe artifacts behind with people in their own contexts. The way they developed the Probe packages out of a necessity epitomised the designerly 'make-do' approach to making use of whatever's at hand (Gaver et al., 1999). They hoped that people would use this opportunity to reclaim their voice in their own way through their engagement with the open-ended Probe tasks rather than being abstracted to 'users' and data.

¹¹ Probes are often colloquially referred to and categorised as a 'method' in a different sense than its use in the scientific research context. For example, Boehner et al. (2007) referred to the misappropriation of Probes as a "divorce between method and methodology", which was then termed 'Probology' (Gaver et al., 2004) to refer to Gaver and his collaborators' specific approach. Later on, Boehner et al. (2012) elaborated on Probes as 'method' in "Inventive Methods" compilation edited by Lury & Wakeford (2012). Similarly, Probes have been studied as "innovative design method" (Lee et al., 2011) as part of a design program that also investigates what method means in user-centred design.

Furthermore, in designing the Probe artifacts and using the returns to inspire final designs within the research process, they incorporated design into the research process rather than the conventional HCI approach at the time. The conventional approach to design research at the time entailed conducting user studies to generate ‘design implications’, engaging designers in the process at the final step of research, and testing the design outcomes. Each step was conducted in a linear, clinical manner by the relevant specialists and the process was scientifically managed in line with Taylorist objective to increase efficiency. On the other hand, Gaver and his colleagues’ approach in ‘Cultural Probes’ didn’t bother about the careful management of the different ‘steps’ of design research process nor the accurate translation of empirical data into ‘design implications’. In the end, Probe returns provided their design team with the insights that would be otherwise inaccessible through HCI’s conventional approach to user studies, which was reflected in the use of the ‘Probe’ metaphor in naming these artifacts. This was presented as a provoking story in ACM interactions magazine, a rather unconventional HCI venue to disseminate research, in accord with their ‘critique of method’. It was also an indicator that HCI’s existing research dissemination frameworks would not support this kind of narratives to design research.

Many interpretations and derivations later, Probes have become a ubiquitous neologism for design-led approaches to research within the field of HCI (section 3.2.4). It has been more than a decade after Boehner et al.’s warning that “variant methods that draw on cultural probes but change these essential aspects *cannot rest on the common acceptance of cultural probes for their validity*” (Boehner et al., 2007, p. 1084: emphasis in original). Despite the introduction of more nuanced design-led terminology to describe the use of artifacts in research, ‘Cultural Probes’ maintain their popularity in HCI. Their critique of method remains a source of inspiration for further interpretations, especially amongst design researchers who do not seem to be restrained by the increasing ambiguity of the literature on Probes nor their questioned legitimacy. In a way, design researchers choose to persevere with a ‘problematic’ concept of Probes, no matter how they may interpret the original concept of ‘Cultural Probes’. Hence, I became increasingly interested in

Probes towards setting my research motivations and questions that I will present in section 1.2.6.

1.2.5 Probes and the disciplinary boundaries of design

So far, I hinted at the similarities between ‘Cultural Probes’ and ‘Research through Design’ and their shared fate in the HCI discourse: Firstly, they were both decontextualised from their material history and original intentions: Neither were meant to be frameworks for design-led research method or methodologies. They only appeared in rather non-conventional venues with different intentions that were sometimes forgotten in the discourse. They were both misappropriated by HCI and eventually transformed into quite different things than their originals: ‘Cultural Probes’ became the generic term of ‘Probes’ that is often referred to or treated as a design-led ‘method’, while ‘Research through Art & Design’ became ‘Research through Design’ as a methodology in dire need of formalisation for legitimacy. Most importantly, I’d like to emphasise the irony that both concepts originated in non-conventional publications (section 1.2.2 and 1.2.4). Can you imagine the turn of events if they were proposed within the limitations of conventional venues, for example, a peer-reviewed CHI paper? They’d be likely to lose their openness to interpretation, that provocative appeal they have for many researchers across disciplines regardless of their engagement with design. Let me also remind of the impact of Engelbart’s demo that initiated a whole new understanding of computing as ‘interaction design’. Clearly, the way research outcomes are presented play an important role in how we perceive its contribution beyond a reductionist understanding of knowledge. However, where that may not be the case, as in the contemporary interaction design discourse in HCI that develop mainly through the conventional research outputs and narratives, how do we understand and distinguish design knowledge?

In many ways, Probes initiated the ongoing definition and negotiation of design’s provisional disciplinary boundaries in the interdisciplinary field of HCI. In the original resources by Gaver and his collaborators (Gaver et al., 1999; Gaver & Dunne, 1999; Gaver, 2001; Gaver et al., 2004), the emphasis has

been on the researchers' 'designer' identity, to be more specific their 'artist-designer' identity¹². This was a means of distinguishing their approach to design-led research in HCI at a time when the understandings of design were limited to "instrumentalised problem-solving" (Pierce et al., 2015, p. 2083). Any other exploratory and creative approach to design was devaluated and dismissed as "black art" (Wolf et al., 2006), as if their close or remote resemblance to artistic research was a bad thing.

Similarly, Probes were accepted in HCI only after a process of "taming" that turned their critique of method into "a relatively standardised and unproblematic method" (Leahu et al., 2008, p. 203). This was also identified in Boehner et al.'s (2007) review of how HCI interprets the Probes and their differentiation of design as an emerging approach to research within the field beyond instrumentalised problem-solving. As more and more design researchers interpreted Probes in creative ways for their design-led research in HCI, Probes continued to demarcate 'true'¹³ design in HCI from the field's preceding understandings of it. For example, Wallace et al. distinguished 'design Probes' from the decontextualised umbrella term of 'Probes' by their emphasis on "keeping design at the heart of the Probes" (2013, p. 3450). Such renaming was, in part, a call for reclaiming design and design-led approaches to research in HCI against scientism.

¹² Here I'd like to make a note of Bill Gaver's background in cognitive sciences and that his PhD research was indeed supervised by Don Norman at the University of San Diego, California. Anthony Dunne was trained as an industrial designer, with a PhD in Computer Related Design at the RCA in the UK. Elena Pacenti is trained as an architect and holds a PhD in design from Politecnico di Milano in Italy. At the time of the publication, they were all working as design researchers at the RCA, which continues to be amongst the leading institutions in art and design education.

¹³ Here I am using the word 'true' to make a distinction between the researchers that come from a design background and others. I am using it a bit ironically for its straightforward disciplinary logic that does not apply to design, as it would assume that design research is something reserved for 'true' designers. Similarly, Borgdorff pointed out to the irony in the defenders of 'true' artistic research and that it should remain independent from any kind of academisation as "an alternative culture of knowledge", caricaturising academia as "disciplining, homogenising, restrictive, conformist, naïve" (2012, p. 5). Throughout this thesis I argue against formalisation of a 'practice-based design methodology' (see section 1.2.1) or disciplining of design in HCI (see section 7.5), but these are rather concerned with scientism and the unique dynamics of HCI than the whole of academia. Whereas in the example Borgdorff introduced, there is an underlying assumption that academia is a scientific institution.

In some ways, it is comprehensible that HCI has a tendency to appropriate methods and approaches from sometimes incommensurable disciplinary traditions under its interdisciplinary roof, yet design seems to be the most 'vulnerable' in HCI. Often attributed to its 'interdisciplinary' nature, the discipline of design has been equally guilty of borrowing methods and approaches from other disciplines in a pragmatic manner. While design might be even accused of simplifying these without much regard for their underlying philosophies, there is a difference to HCI's appropriation and design's borrowing of methods and approaches: Design does not make claims about the home disciplines that it borrows from, whereas HCI tends to do that. This is particularly exemplified in HCI's uptake of 'Probes' as a method and 'Research through Design' as a methodology for interaction design research, while questioning design's legitimacy as a research endeavour.

Additionally, matters are made worse by the multiplicity of the broader design practices within and outside the academic contexts that make the research outcomes of design more vulnerable to appropriation. For example, Light gave the examples of "the dilution of the politics of Participatory Design" in the design industry to become "user-centred design" or the commercialisation of a disembodied version of "design thinking" (2018, p. 149). Such appropriations of designerly concepts and approaches coming from within can have a normalising effect and indeed make design more vulnerable than it has already been. On that note, Light further added: "Design is, as currently enacted, fashion-oriented and many ideas are used merely to inspire the market or claim a space in the research pantheon" (2018, p. 149).

'Probes' have become an 'over-studied' topic¹⁴ and already been replaced by the current trend of 'design fiction' in HCI to be studied further. However, it is not the Probes themselves that I'm interested in in this research, but how Probes have been negotiating the disciplinary boundaries of design in HCI. Ghassan & Blythe (2016) argued that HCI's appropriation of Probes as a

¹⁴ This was actually one of the comments I've received for my paper submission to CHI 2021 on my interview study on how design researchers interpret Probes (Çerçi et al., 2021).

method re-constructed the sense of legitimacy according to its science-based research frameworks, asserting dominance over design. We see the same appropriation in the attempts to formalise RtD for the sake of legitimisation. The links in-between reveal how HCI has governed design and design-led modes of knowledge production and continues to do so (see Chapter 7): Firstly met with resistance, questioned in regard to their legitimacy and perhaps even devaluated; then 'taming' to no longer resemble their original in terms of its critical intentions; and finally fully appropriated towards formalisation with the good intentions of saving the 'damsel in distress'. Nonetheless, these processes become apparent only if looking at these from a historical design perspective, which is why this kind of intellectual housekeeping is necessary.

1.2.6 Research interests and approach

My methodological inspiration mainly came from new materialist approaches that trace a material in its travel through the material world as they contribute to the world of ideas (de Landa, 2021). I treated citational or linguistic references to the key terms I am interested in, mainly Probes and Research through Design, as my material to trace in order to understand how they contributed to understandings around design research and its value. As a result, I did a combination of critical literature reviews that reconstructed a narrative for how RtD came to be (see Chapter 2) and how HCI research came to be (Chapter 3). Tracing the citational references made to Gaver et al.'s (1999) key text that introduced 'Cultural Probes' to HCI research, I identified design researchers who have used and published on Probes for their RtD projects in HCI. In conducting interview studies with these design researchers, firstly in individual interviews (see Chapter 5), then in group interviews (see Chapter 6), I further traced how things became Probes. That is, how their practices of using designed artifacts for research was aligned with the fluid concept of Probes and how its fluidity impacted their material references in return.

This was in line with Ghassan & Blythe's (2016) argument of HCI's science-based research frameworks dictating how matter is organised that was also

based on new materialist concepts. In close examination to understand what a Probe is within the ambiguity of the literature on Probes, I have realised how design researchers self-organise themselves in HCI around these terms through the dissemination and citation practices: Firstly, they seemed to insist on citing the original sources, Frayling (1993) for RtD and Gaver et al. (1999), often along with Gaver et al. (2004) for 'Probes' as opposed to HCI's appropriated versions. Moreover, their publications had an evasive attitude to specifying the crucial aspects of their use of Probes as part of their RtD approach, including the intentions to use Probes and how things came to be Probes. This was often supported by phrases like "Probe-like", "similar to Probes", "inspired by Probes" in the text.

On the other hand, the methodological discussions surrounding RtD in HCI often critique these crucial aspects of the design-led research process that are made implicit in the dissemination in HCI. For example Zimmerman et al. stated the need for "more examples where the *intentional* choice and use of RtD approach as a methodology and process is both described and critically examined" (2010, p. 317, emphasis in original). More recently, Zimmerman et al. (2022) identified a specific and potentially harming gap in documentation around 'reframing' in RtD by romanticising design. Similarly, Mareis (2012) discussed this tendency to leave out the important aspects of the design process as part of 'tacit knowledge' in design. However, she also argued for a sociohistorical study of design knowledge in order to avoid positivistic reduction or "romantic idealisation" of tacit knowledge (Neuweg, 2004 in Mareis, 2012). These concerns indeed correspond to the 'conservative' and 'romantic' account of design in HCI respectively, as identified by Fällman (2003). The implication of these criticisms is the gatekeeping around design know-how, whether intentional or unintentional leading to the impression of design as "the 'black art' of CHI" (Wolf et al., 2006).

As a result, I was urged to understand firstly what the crucial aspects of design-led research were and why they fell through the crack in the reporting, taking Probes in HCI as my case study. My driving research question was "How and why do design researchers use Probes as part of their RtD projects in HCI?".

However, as I became more familiar with HCI design research, I realised RtD was not inclusive of all design-led research in HCI due to its historical baggage. I did not want to further engage in the micro-politics of terminology and therefore did not trace explicit references to Frayling (1993), and instead used my own judgment to define 'designerly' forms of research that are aligned with Frayling's formulation (section 4.1.2).

Upon conducting the first interview study, I have changed the question to "How and why do design researchers make use of Probes as part of their design-led research in HCI?". This indicated a shift in my approach to the research that aimed to include the role Probes played in HCI in terms of facilitating different approaches to design research. In the end, my overarching research question has become: "How do Probes facilitate the politics of design research within HCI?". I became more interested in understanding the ways design research was valued within the HCI research community, which I am a member of. Hence, it became imperative to assemble these rather neglected or taken-for-granted aspects of design research in HCI as follows:

- 1) How is design-led research understood and practiced differently across HCI communities? What are the historical and political factors that led to this variance?
- 2) What are the overlooked aspects of disciplinarity in design-led knowledge production in HCI?
- 3) What is the role of dissemination in the (re-)production of design-led knowledge?

1.3 Key Concepts and Terms

Before moving on, I'd like to explain the terminological choices I've made throughout this thesis and the reasons why under the following sections. Biggs argued that "the language becomes constructive of the concept of research than merely describing it" (2002, p. 112). This resonated with De la Bellacasa: "Ways of studying and representing things can have world-making effects" (2011, p. 86). It is especially important for this research, where I am also

concerned with the semantic changes Probes and RtD have undergone to understand the multiplicity of design's connotations and how these come to govern design in HCI due to its relationality (see Chapter 7).

1.3.1 Design and Research

First of all, I distinguish 'academic design research' from the design research taking place in the industry. I am not interested in how design generates knowledge, but rather how that knowledge is legitimised or made to comply with the academic criteria for research. It should be noted that both academic and industry endeavours may involve 'academic' knowledge generation, as can be observed in the HCI context, or the ultimate goal of problem-solving through the design of an end product as in the 'academic design' approaches (Dorst, 2013; Koskinen & Dorst, 2015; Walden & Koskinen, 2018). In fact, academic design research may also have the end goal of designing a market-oriented product in collaboration with and/or funded by industry stakeholders.

I acknowledge that some of the issues around design's shift to research potentially stem from the semantic ambiguity of the word 'design', as observed by John Heskett: "Design is to design a design to produce a design" (2002, p. 5). The multiplicity of design's connotations and configurations across diverse contexts make it even more difficult to define 'design'¹⁵ before coupling it with research in various forms.

In this thesis, I use design research at times as the encompassing term for all domains around design, including the theoretical domains of design studies and design history, as well as the more practice-based forms of design research. At times, I use it when I do not want to demarcate design-led research as the more practical one from its theoretical counterparts within design research, for theory and practice does not happen in isolation from one another in design (Yee, 2010).

¹⁵ Contemporary design is even more multiple. For example, in his book titled "Economies of Design" (2017), Guy Julier talked about Shanzai in China, Jugaad in India, Horizontalidad in Argentina as examples of alternative and informal design economies, where design would have very different connotations to than the formal and Eurocentric contexts of design.

I am also aware of the rather theoretical connotation of ‘design research’, potentially feeling too broad for describing more practice-based forms of design research. ‘Practice-based design research’ fills that gap and is commonly used across design research communities, but is rarely used in HCI and its multiple design communities that may not see themselves as doing design research¹⁶ or aim to contribute to the ‘design research’ of arts and crafts origin, namely ‘design studies research’ (Margolin, 2016). It remains somewhat exclusive to the designer-practitioner-researchers, those that come from a design background to further obtain doctoral degree in design (Vaughan, 2017). I sometimes refer to them as designer-turned-researchers where I may want to emphasise disciplinary background prior to becoming a researcher. There have been proposals to mitigate such exclusive connotations and also emphasise the nature of practice-based design research often taking place in multidisciplinary teams and/or with stakeholders, such as ‘project-grounded research’ (Findeli et al., 2008; Findeli, 2010). Such proposals reflect the case-based, context-specific findings of design-led research (Tonkinwise, 2017); however, the use of ‘project-grounded research’ remain limited in the design discourse for it is not discipline-specific.

Although the title of this thesis may suggest that it focuses on RtD, I use RtD as a point of departure to locate and understand the plurality of approaches to grounding research in design under the umbrella term. RtD can have different meanings that are contingent to people’s own experiences of becoming a design researcher (section 1.6). Even where it may be used in a colloquial sense, it is likely to be associated with Frayling (1993) in the arts & design context, or with Zimmerman & Forlizzi’s specific interpretation (2014) in the HCI context. Several other suggestions have been made to describe forms of

¹⁶ Weird enough, one may identify as a ‘design researcher’ while not necessarily identifying as doing ‘design research’, especially in a field like HCI that amalgamate multiple origins to design and designing. In these cases, design researcher can be someone who does research on designing and engineering systems without a care for ‘design research’ capitalising on the humanities, arts and crafts. This was also noted by Zimmerman et al. (2007).

research that is grounded on a wide range of design practices and understandings without engaging with the historical baggage of the term. As I will explain below, these other terms are not meant to replace nor claim to offer better alternatives to RtD, but elaborate on it. Also using RtD as a point of departure, they may specify (e.g., Constructive Design Research, Critical Design¹⁷) or re-interpret it (e.g., design-research). Hence, RtD has become an umbrella term that is often used interchangeably with these other terms. So, in the title of this thesis, ‘probing into RtD’ signifies a departure from RtD as coined by Frayling, but looking into its history and contemporary discussions surrounding it to explore its role in gathering a diverse range of approaches to design research under the umbrella term. As such, I use the umbrella term to denote ‘design-led research’, where ‘design research’ may not address forms of research that makes use of design practices in one way or another.

Another term that can be commonly observed in HCI is ‘constructive design research’ (CDR), introduced by Koskinen et al. (2011). CDR aims to be more inclusive and open to different methodological and theoretical contributions to design without the disciplinary baggage of ‘Research through Design’. It acknowledges the heterogeneity of design research emerging from different origins with different alignments identified as Lab, Field and Showroom approaches corresponding respectively to scientific, social scientific and artistic evaluation of the artifacts towards knowledge generation (Koskinen et al., 2011). There is an emphasis on the ‘constructive’ aspects of design like constructing artifacts and processes, but also denote to their inclusivity and pragmatism as in the use of ‘constructive’ in ‘constructive criticism’. However, I am not entirely convinced that this term captures all aspects of designing. For example, the specification of the ‘constructive’ quality of design research limits the understanding of criticality in regard to design to the progression of artifacts in design research. In my opinion, in line with Tonkinwise’s (2019), it discounts the philosophical questions around ‘defuturing’ (Fry, 2008) design research asks itself to extend its scope as a mode of inquiry about the world

¹⁷ I will not be talking about Critical Design here because I will be discussing it regard to criticality in design specifically in section 8.2.1.

made by design (Fry, Dilnot, & Stewart, 2015). This understanding of design research was argued to position it closer to the humanities (DiSalvo, 2018, p. 72). As a result, the use of CDR simply wasn't suitable for the purposes of this research with a much broader understanding of design.

Likewise, I purposefully avoided Fällman's (2005) distinction of 'research-oriented design' and 'design-oriented research' in HCI for its emphasis on designing as the generation of designed artifacts. Upon a closer examination, I felt that such distinction reinforced the so-called tensions and incommensurability between design and research by situating design and research practices and orientations at both ends of a spectrum. As such, it reminded me of the basic and applied research distinction in the sciences with methodological implications that were not suitable for my understanding of design and design research.¹⁸

Finally, Gatehouse's (2020) hyphenation of 'design-research' captures the unspecified nature of this coupling between design and research in comparison to the contrived categories of research through/for/about design that seem to reinforce the disconnect between design history, theory and practice (Atkinson & Oppenheimer, 2016). However, for the purposes of this research, I chose to colloquially use 'design-led research' in order to encompass any approach that involves a kind of 'design' in research, whether closely or remotely related to design practice. This is reflected in my choice of 'design-' rather than 'practice-', which would potentially include forms of artistic or social research led by practice, but exclude some of HCI 'design'.

¹⁸ To put simply, basic research focuses on the advancement of knowledge through the construction of theories, whereas applied research focuses on the real-world problems through the construction of solutions. Despite design's seeming similarities to applied research, such as their concern for 'problem-solving' in the messy, real-world contexts, applied research adopts scientific and mostly empirical methodologies. This is not true for design-led research that often employ speculation and intuition in the materialisation of ideas, which was also acknowledged by Fällman. However, I had a hunch about its similarity to basic/applied research distinction due to the inseparability of theory and practice in design-led research.

The choice of ‘-led’ instead of ‘-based’ signifies a wider range of possibilities than potentially locating it in the design discourse. In summary, my choice is based on the premise that while all practice-based design research is design-led research, not all design-led research is design research. Making use of creative and/or participatory methods and designed artifacts is not unique to design research and it can be hard to demarcate where design starts and where it ends in research¹⁹. For example, Participatory Action Research has striking resemblance to ‘participatory design research’ with a shared emphasis on participation and future-oriented change. Nonetheless, I chose ‘design-led research’ to specify ‘design’ in its ambiguity and multiplicity in different research contexts.

1.3.2 Knowledge and Knowledge Production

It is not possible to go into all the ways of knowing in design-led research within the scope of this thesis, but I need to clarify what I mean by knowledge and choose to focus on ‘knowledge production’ in this thesis. Since the early beginnings of design research, what constitutes knowledge in design has been discussed extensively from a range of different perspectives and under different names like “designerly ways of knowing” (Cross, 1982) and “design thinking” (Rowe, 1991; Buchanan, 1992; Kimbell, 2011; Kimbell, 2012; Wendt, 2015).

A special attention has been given to the role of artifacts in design-led knowledge generation, extending the notion of knowledge residing in the knower onto the artifacts created within design-led research. The different framings to how these artifacts generated knowledge ranged from the perspectives on the artifact itself embodying the knowledge (Carroll et al., 1991; Frayling, 1993; Dunne & Raby, 2001; Gaver, 2001) to viewing the artifact as a point of departure for knowledge. For example, it has been argued that knowledge resides in the discourse around the artifact (Zimmerman et al.,

¹⁹ This matters because it can be equally hard to demarcate the speculative, overtly ‘designerly’ uses of Probes from its more qualitative method-like uses even within design research.

2007; Zimmerman et al., 2010), which would potentially lead to a plurality of design ‘programs’ that are coherent in their approaches to design-led knowledge production (Binder & Redström, 2006; Redström, 2017). Some argued that knowledge is rather unfolded in the critical reception of artifacts that could lead to several and even incoherent interpretations in a humanistic understanding of design (Bardzell, 2011; Bardzell et al., 2015). A radically different approach to how artifact generates knowledge in design-led research came from participatory design. Within these approaches, the artifacts often act as boundary objects to generate knowledge that is situated, local and distributed across the participants of the socio-material assemblages they created (Binder et al., 2011; Björgvinsson et al., 2012).

Krogh & Koskinen (2020) attempted to justify these sometimes radically different formulations of how artifacts could generate knowledge in design-led research in their analysis of ‘drifting’. They described ‘drifting’ as “the story of a designer capable of continuous learning from findings and of adjusting causes of action” (Krogh et al., 2015, p. 39). While the notion of ‘drifting’ is deemed as a failure or breakdown in scientific research for “bearing the touch of randomness, the uncontrolled, illogical and inconsistent” (Krogh et al., 2015, p. 43), they argued that it is essential to design experimentation in research. Drifting acknowledged the non-linearity of design practice and further embraced the plurality of design-led research practices as ‘different epistemic traditions’ to an extent as opposed to positioning design and research on the different ends of a spectrum as binaries. However, it fell short on acknowledging the intentions to design-led research despite the title of their analysis as “Drifting by Intention” (Krogh & Koskinen, 2020) in its over-emphasis on designer’s agency and subjectivity in the process. Hence, the notion of drifting wasn’t much different than Schön’s (1987) framing of practice as a “reflective conversation with the situation” from an individualistic perspective²⁰, but combined it with ‘design programs’ mentioned above in

²⁰ Ehn & Ullmark (2017) noted that Schön himself criticised the reductionism in ‘conversational design’ in his later research.

order to identify the prevailing approaches to knowledge production in design-led research in HCI.

The practice-perspective to design-led knowledge production expanded the notion of knowledge to include the less articulable components of what could potentially constitute knowledge in design practice. These included ‘reflection’ (Schön, 1983), ‘tacit knowledge’ (Polanyi, 1983; Mareis, 2012), ‘experiential knowledge’ (Borkman, 1976; Biggs, 2007; Niedderer & Reilly, 2010; Nimkulrat et al., 2020), ‘design judgment’ (Nelson & Stolterman, 2003; Nelson & Stolterman, 2014), intuition (Faste, 2017). Whatever the names and their scope, I occasionally refer to these as ‘know-how’ in this thesis where I prefer to indicate the lesser articulability or transferability of these kinds of knowledge. I will not be going further into design generates knowledge, for this research is not about design epistemology, but about how ‘knowledge’ in the academic sense is produced in design-led research. To put simply, it is more about knowledge claims than knowledge. However, when talking about knowledge throughout the thesis, unless specified, I am using it in a colloquial sense to include both explicit forms of knowledge that can be articulated in a wide range of modalities like text, image, spoken word or artifact, and the inarticulable ones as per above.

I will be using ‘knowledge generation’ for any activity within design research that creates a learning experience for anyone involved in the process, regardless of its degree of articulability. In contrast, I will be using the sociological term of ‘knowledge production’ when describing the institutionalised ways of producing knowledge through academic research. That includes the legitimisation processes that are black-boxed into the notion of ‘knowledge production’, as well as the taken-for-granted notions of research, disciplinarity and knowledge. I may sometimes use ‘research’ to denote to the ways and outcomes of institutionalised knowledge production, as in Frascati Manual’s exclusionary definition of research (section 1.2.3). This allows me to understand how ‘design knowledge’ that could have been explicitly articulated otherwise are made implicit in the process of fitting into academia’s existing structures and preconceptions of ‘research’.

1.3.3 Science, sciences, scientific

It has been argued that no other branch of philosophy is as disconnected from its history as is epistemology to illustrate how the relationship between philosophy and the sciences came to be what they are today (Pasnau, 2017). Upon a disconnect between the sciences and philosophy, a much narrower and specialised branch of philosophy was made subservient to a much narrower and epistemically idealised science in order to stay relevant within academia since the peak of Enlightenment in the 18th century (ibid). As a result, science has become its modern understanding today as an autonomous discipline that set the research frameworks and epistemic ideals around 'knowledge' in academia as a search for 'the truth' in all its certainty. This is the core to the scientism argument (section 4.1.1).

Past the arguments for 'the tyranny of science' (Feyerabend, 2011) as a supposedly single institution, we have a more nuanced understanding of the sciences today, thanks to the science and technology studies. However, we also know from feminist and postcolonial studies that institutional changes happen much slower in comparison to the perspectival changes people can embrace. As a result, approaches other than what had been historically valued was met with resistance within academia. Within the belief that the scientific revolution led to more rigorous epistemic standards in domains outside natural science (Pasnau, 2017, p. 148), emerging disciplines of scientific research could enter academia only through an imitation of science in its narrow understanding. For example, the authority of quantitative approaches in social research was challenged by firstly qualitative approaches to further nuance into 'Qualitative' with big q and 'qualitative' with small q (Bryman, 2016; Clarke, 2021). Such dominance of science was also key to Deleuze & Guattari's distinction of royal and minor science (2004), which was picked up by Ghassan & Blythe (2016) to refer to "designer as minor scientist" in order to explain the fluidity and sense of legitimacy within the 'science of design'.

It is in this context that I am referring to science as the much narrower understanding of the sciences. However, I am making a further distinction as 'scientific research' as the research taking place in academia regardless of their status as a science. In terms of design research, this was also picked up by Cross (2001), who distinguished three different interpretations to the design and science relationship as scientific design, design science, and science of design. In this sense, design research as a study of design is scientific research, or a 'science of design' in Cross' words that should not be perceived as serving the development of a 'design science', where design is understood as a scientific activity itself (2001). Cross further wished to develop design as a discipline based on this understanding of design research as a 'science of design', while leaving the nature of design open to interpretation (Cross, 1999; Cross, 2001; Cross, 2001a; Cross, 2007; Visser, 2009). That's where I am coming from when questioning the distinction between design and science throughout this thesis.

I argue that design research should not strive to fit into scientific modes of knowledge production that are set by the narrower understanding of science within academia. Within the scope of this thesis, I am more specifically discussing this in terms of research dissemination. Once again, I am aware that sociology of science tells us that science does not happen as linearly and smoothly as the popular misconception or the implication of my arguments throughout this thesis. However, I am pointing out to how academic research frameworks are likely to favour some approaches to design research or 'mutate' design research in its desire to fit in with the implicitly scientific understanding of research and its evaluation frameworks (Gaver & Bowers, 2012).

1.3.4 Design researcher, designer-practitioner-researcher, designerly, designer-turned-researcher

Knowing in design is situated in the sense that it demands an actor and is contingent to its relevant circumstances and conditions. This not only transforms knowledge and knowing into acts, but also legitimacy into a

context-specific phenomenon (Leino & Peltomaa, 2012). This is particularly true for Probes and how they generate knowledge in design-led research and was implied in resembling Probes to a kind of “Rorschach test, revealing their uptakers’ perspectives and preoccupations” (2007, p. 1082) with different contextual understandings of legitimacy (Ghassan & Blythe, 2016). I aimed to emphasise that in this research through a shift in my focus from design knowledge to design-led knowledge production as mentioned earlier.

If we indeed understand designer as a minor scientist as Ghassan & Blythe (2016) and Wakkary (2020) suggested, then we have to understand design research in terms of ‘becoming a design researcher’ rather than its heterogeneous disciplinarity. The concept of ‘minor science’ is related to the concept of ‘becoming-minor(itarian)’ in Deleuze & Guattari’s (2004) philosophy. This concept emphasises becoming over being to refer to how something comes to be through its ongoing relations with other entities and will remain open to constant change through these relations. The existing structures of power indeed determine the nature of this relationality, as well as the future capacities for such, which is coined ‘affect’ (Deleuze & Guattari, 2004). We see the applications of this concept to explain how something is made ‘minority’ to marginalise and discriminate against. Examples include ‘becoming-woman’ as a feminist argument or ‘becoming-animal’ as an anti-specieist one.

In design, the degree of relationality and heterogeneity is higher than many other disciplines, therefore knowing is much more situated, too. The capabilities of design research is limited to those of design researchers rather than its disciplinary attributes. Design research is something design researchers do, but it does not always aim to contribute to design (Zimmerman et al., 2007). Moreover, design is not something that is limited to what ‘disciplined’ designers do (Dykes et al., 2008). By ‘disciplined’ designers, I

mean those that were trained as designers²¹ to further obtain a doctorate degree in design, which I refer to as ‘designer-turned-researcher’ in a similar manner to Vaughan’s (2017) ‘designer-practitioner-researcher’, but to emphasise the disciplinary background prior to becoming a design researcher. I use ‘designerly’ to refer to concepts and approaches that make use of creative design practices for research as opposed to rational understandings of design. It indicates a positioning than a professional or disciplinary background. I will talk about how this was important in strategical choices to identifying design researchers to invite to the interview studies in section 4.1.2.

Furthermore, design and design research varies even across the community of designer-practitioner-researchers due to a lack of shared structural and historical factors determining a ‘community’ (Tunstall, 2008 in Davis, 2008). The complexity to how design, design research and design researcher ‘affect’ each other is observable especially in HCI and resonated across the study participants of this research. So, for me, it is more important to understand how one becomes a design researcher and their individual concerns that ‘affect’ the ‘community of design’ in HCI and design research as a supposedly single institution. Hence, I put an emphasis on ‘becoming a design researcher’ throughout this thesis and further talked about my own journey in section 1.6.

1.3.5 Probe, Probes, Probing, ‘Probology’

When referring to Probe artifacts, I may use Probe and Probes interchangeably, depending on their materiality. I indicate where I am referring to the concept of Probes rather than the material artifacts that are used for the research. When referring to the approach in which the Probe artifact(s) are used or when I’d like to emphasise the process and practice aspect of Probes, I use Probing with capital P to differentiate it from the colloquial use of ‘probing into’ something. I refer to ‘Probology’ as the discourse refers to distinguish

²¹ Yet, it is still tricky to define a designer and limiting the use of the label to prior training is restrictive. On the one hand, ‘being a designer’ involves using design and making “to exert an active stance towards the world and care for the outcomes we provoke” (Wendt, 2015, p. 61) and that care is often emphasised in the craft approaches within the design discourse. On the other hand, anyone who possesses ‘design thinking’ can think like a designer.

Gaver's approach of 'Cultural Probes' from the generic term it has become (implied in Boehner et al., 2007; named in Gaver et al., 2004). A similar argument was made for Dunne & Raby's stylistic and pioneering approach to critical design in Pierce et al.'s (2015) notation of 'Critical Design™' from other critical approaches to design that diverged from theirs under the umbrella term of Critical Design.

1.4 Contributions to knowledge

Design research is something design researchers do, but it does not always aim to contribute to the discipline of design. Similarly, design is not limited to what 'disciplined' designers do. This thesis contributes to the ongoing definition and negotiation of design's provisional disciplinary boundaries in HCI. It explores through the lens of 'becoming a design researcher' the underlying issues to design's disciplinarity, design research practices, and how these relate to the broader context of academic knowledge production. My objective is to demonstrate the value of design research not necessarily as a disciplinary means of knowledge production, but in the way it encapsulates and touches upon the contemporary concerns of academe: the limitations of disciplinarity in the face of increasingly complex real-world problems, the positioning of academe in relation to the society, the purpose (and ulterior motive) of research, theorising within the situatedness of knowledge, and the evaluation of research and its impact. In that sense, one can argue that design research is ahead of its time; yet, none of these indicators guarantee the ability to distinguish good research practices from the bad ones: A good research is a critical one. Simple as it is, criticality is perceived in quite different ways in the research context. So, I set out to find out mine, and also in design (see section 8.2.1).

The contribution of this research is twofold: Firstly, I aim to demonstrate the value of design research from a 'design school' perspective. I elaborate on different aspects of design research that are made implicit throughout the course of its heterogeneous academisation, resulting in what I identify as a 'research recognition gap' in design. When practice-based forms of design

research were included in the third-cycle education, it did not happen alongside the necessary structural changes for their healthy accommodation. Therefore, the existing science-based research frameworks favoured some forms of design research over the others, creating disparities in terms of worth, visibility and acceptance of design within academia. This research recognition gap underlines the methodological discussions around RtD, catalysed by HCI's appropriation of the term towards a formalised interaction design research methodology. I also argue that the research recognition gap has resulted in different valuations of design research, and in some cases, the value of design research has been mistaken for the value it creates. I investigate the narratives around design research in the research context of HCI, where design research entails a wide range of understandings, approaches, and valuation in terms of its purpose and outcomes. In the light of this, I argue that RtD is valued for its potential capacity for design theorising if formalised as a methodology rather than for its value as a practice-based approach to design research.

Secondly, I provide an example to how research recognition gap facilitates the governance of design in design research contexts like HCI (see Chapter 7). I investigate the narratives and practices around Probes in HCI as a case study to explore how design researchers navigate within HCI's science-based research frameworks when disseminating their practice-based design research, as often referred to as RtD in HCI. Two interview studies with design researchers who used and published on Probes for their design research projects in HCI reveal the implicit aspects of *making use* of Probes in HCI. However, these details are often omitted in the reporting on Probes when disseminating design research in HCI, mostly due to material limitations of the research frameworks, but also part of design researchers' strategies to navigate the governance of design in HCI. I acknowledge how these crucial aspects of Probes that are made implicit in their dissemination in HCI may further contribute to the research recognition gap and impact the future of how design research is valued in HCI and academia. As a result, I provide some practical suggestions and future action to take, based on the collaborative

effort of design researchers taking part in my interview studies and my own experiences of navigating the HCI and design discourses.

1.5 Thesis structure

In this chapter, I set the basics for this thesis; that defining design is an ideological act. I start by setting the context that it is acknowledged in the contemporary design discourse and intentionally left vague for design research to explore more possibilities than the clearly defined ones. I argue that design specialisms entail loose boundaries in a 'design school', indicating a practical focus than an organising category. I differentiate 'interaction design' from these other design specialisms based on its origins in a computing research context rather than emerging from professional practices. I then explain how these different designs interact in the interaction design research context in HCI, where design is governed²² due to HCI's science-based research frameworks and problems around disciplinary knowledge production. I argue that Probes, emerging as a designerly approach to HCI research, have since been negotiating the disciplinary boundaries of design in HCI. I present my driving research question that aims to explore the implicit aspects of Probes as such. I explain my key concepts and terms to address how I navigated the micro-politics of design research. I talk about my background and positionality that is relevant to how and why this research came to be in the way it did. In doing so, I aim to show that situated knowledge indeed contributes to design.

In Chapter 2, I will engage in constructing a historical narrative for how design and design research came to be as separate domains of knowledge (section 2.1 and 2.2 respectively) until the inclusion of practice-based design research in third-cycle education (section 2.3). My aim is to demonstrate how ideology is implicit in design; in the way design is defined and studied, in the way design curriculum is structured and taught, in the institutional configuration, in the way theory and practice relationship is approached in design research, in the

²² I will be discussing that in Chapter 7.

aesthetics of the design outputs, in the way value (or bias) is attributed to design, in the way design is positioned in relation to society, in the way design research emerged, in the language of design research. I am not an historian, so it should be perceived as a ‘meditation’ on the history of design and design research to support my arguments. I engaged with the milestone events that were relevant to the narrative of this thesis rather than aiming to provide a chronicle or an accurate representation of the course of history²³.

In Chapter 3, I will construct a similar narrative for how HCI came to be as a research field with its key discussions around design, disciplinarity, and knowledge production. Based on these, I will talk about the emergence of Probes as a designerly critique of method in HCI. I will explain how it subverted the conventional approaches to user studies and the linear and scientifically managed approaches to design research that limited the inclusion of design practice in research and the innovative possibilities for technological design. I will briefly discuss how its uptake revealed some of the symptomatic problems that have been made implicit in the ongoing expansion of the field. I will demonstrate that these problems continue to impact the collective progression of HCI research more than they impact the design research communities in the field.

In Chapter 4, I will elaborate on my methodology and how thinking ‘designerly’ alongside ‘qualitatively’ benefited this research in making a case study of ‘Probes in HCI’.

In Chapters 5 and 6, I will present the specifics of the two interview studies with design researchers who worked with and published on Probes in HCI.

In Chapter 7, as mentioned above, I will discuss how design is governed in HCI as a result of the ‘research recognition gap’ that came with the heterogeneous academisation of design. I will first tackle this in terms of how design is demarcated to make it fit into HCI’s underlying Taylorist tendencies

²³ I will be discussing my approach in more detail in section 8.1.

to organise and categorise design research (section 7.1). I will argue that the turn to design is a rather extractivist one than a truly accommodating one (section 7.2). I will also acknowledge that it allows more and more design researchers to make use of these appropriations, as well as expanding the scope of design research within HCI. I will proceed with programming design, where the efforts to make design theory have underlying scientific assumptions to theory-method relationship rather than thinking of design theory on its own terms (section 7.3). I'll further argue that HCI is not a design-oriented field but a design field due to its concern for technological design (section 7.4). In doing so, I'll argue that the debate around including design in HCI is underlined by the field's multidisciplinary origins that also assume design's disciplinarity. Finally, I'll point out to the resulting efforts to discipline design in the form of formalising and homogenising (section 7.5).

In Chapter 8, which is the conclusion of this thesis, I will suggest some future action to be taken. These include developing further approaches to design historiography coming from within practice. I'll emphasise criticality in design as its most valuable contribution to academic research and its diverse ways of knowing. I'll point out to the situatedness of critical thought and how we can accommodate design's situated knowledge within academic research frameworks.

The order of these chapters is intended to reflect the non-linearity of how this research unfolded for me. Theses are mostly written in retrospect and research questions are post-rationalised in the writing phase. The complexity of the learning process of the researcher is often smoothed out. It was important to me that each chapter was layered and spoke to each other, so that if any chapter was to be read in the light of the others, new meanings could potentially emerge. For example, in Chapter 2, I am hinting at the Research Recognition Gap, but I am naming it and elaborating on it in Chapter 8. By writing historical narratives for both design and HCI research in Chapters 2 and 3 respectively, I am hinting at the similarities to their progression and ongoing disciplinary problems, but also contrasting. In this Introduction chapter, I have already implied the governance of design in HCI, yet I will be

detailing in Chapter 7. The thesis comes full circle, because in the end I could only make visible what may be implicitly known to many but rarely made into a case. It'll take more to take action for the proposed structural changes, but it's a starting point for becoming a design researcher.

Lastly, footnotes are abundant in this thesis; at times to elaborate on something without interfering with the readability of the thesis, at times to include myself in the conversation. For example, when presenting the findings of the second study (see section 6.5), I included my commentary on the analysis, for I didn't join in the group conversations at the time but only moderated.

1.6 Becoming a design researcher within design research's becoming

Design's latter inclusion in academia means that academic frameworks may not always be ready to accommodate design researchers. The tensions become apparent once you're a PhD student and your responsibilities to the public begins: You are now an 'expert', burdened with the invisible labour of explaining that design research is alive and indeed kicking (Rodgers & Yee, 2016). Its rich heritage allowed design expertise to evolve into different approaches and philosophies underlying the practice of design. Yet, design expertise has historically been criticised, depreciated and appropriated both internally and externally²⁴. Becoming a design researcher may even involve an invisible emotional labour of having to defend design research against the biases around design as privileged, frivolous or even superfluous, while dealing with one's own disciplinary anxieties (e.g., lacking in formal research training).

²⁴ For example, Gaver et al. (1999) addressed Participatory Designers as 'servants' for their approach to design as facilitating designing-with rather than designing for people as 'experts'. While their goal was to differentiate their approach and position themselves within the landscape of various design practices at the time, this kind of positioning has negative connotations for approaches other than one's own and belittles their expertise. Similar could be said about Dunne & Raby's positioning of Critical Design against 'affirmative design'.

As a result, one needs to co-navigate academia “alongside one’s supervisor” (Harrison & Grant, 2015, pp. 559-560)²⁵ to “convert” (Hockey & Allen-Collinson, 2000, p. 348; Clerke, 2012, p. 6). Therefore, the journey of learning how to research in art and design is often more emphasised and valued over its knowledge outcomes (Gray & Mallins, 2004). This is particularly true of becoming a design researcher in the UK context of this research, where design doctorate programs entail ‘PhD studentship’ and have corresponding expectations and responsibilities of the becoming-researcher. Yet ‘playing out’ the dual role of autonomous, independent thinking ‘researcher’ and guided ‘learner’ is still complex and demanding for all parties involved, which extends further onto the research networks supporting the candidate (Tennant & Roberts, 2007). Most members of my support network were working within the interdisciplinary research field of HCI. Therefore, my conversion into a design researcher happened in that particular context, where design has been disputed in ways that were sometimes at odds with my own understanding of it due to my somewhat eclectic background in design. It is in this context that I had grown an interest in understanding the narratives and practices around design-led knowledge production in the interdisciplinary field of Human-computer Interaction (HCI).

I mentioned having a somewhat eclectic design background, which I believe is important for the perspective I am able to bring into this research. First of all, a design lens has the potential to inform research practice in tackling a topic in more creative ways, embracing uncertainty and ambiguity, being more open to un-learn and re-learn (Yee, 2017). I’d add the concept of ‘gestalt’ to the qualities of a ‘designerly researcher’ as an example of what the design school teachings can bring in to the research. Gestalt is explained as an capability to perceive that “the whole is more than the sum of its parts” in its commonly attributed adage. I’d argue that for a research that aims to draw

²⁵ Harrison & Grant argue that the supervisory approaches are more innovative and considerably fluid in practice-based research in newer or ‘non-traditional’ disciplines, where the research supervisor works “alongside the student” rather than the traditional ‘master-apprentice’ style of knowledge transfer in more traditional supervisory models of research in higher education (2015, p. 559-560). This would also mean that they share the ownership and responsibility for the research (ibid), which was the case for my research, too.

connections between the much broader contexts of design and design research and a specific case of design-led research in HCI like this one, this capability is more than necessary. Furthermore, Baha et al. (2020) argued that design education helps a student develop their own personal vision for designing and personal development by pointing out to the dynamic entanglement between personal and designer identities throughout their training. I have trained and gained experience in a wide range of design domains, including industrial design, advertising and retail design, interaction design, design management & leadership, in several locations like Turkey, Denmark and Sweden²⁶. However, I would not necessarily describe myself as a very 'hands-on' design researcher for I have grown to develop theoretical leanings and interests over the years, but a design perspective has become second nature to me. Therefore, I was able to anticipate and shape the research towards an exploration of the implicit aspects around design-led research in HCI, also urged by my network. Besides, this decision mitigated the impact of Covid-19 on my PhD process and indeed worked to my advantage. I was able to bring together design researchers across the world at a time when virtual gatherings were flourishing and we weren't as 'zoomed out'.

Another important question asks why I chose to do a PhD in design. It certainly involves personal motivations like "shine a light into my own 'black box'" (Yee, 2017, p. 156) and intellectual and professional advancement (Melican et al., 1998). Brassett & Marenko (2015) argued that design should be understood as a becoming than studying into what it is, for it unfolds differently for those becoming a design researcher. Here, I'd like to not only acknowledge, but own

²⁶ In each of the schools I've studied design at, the department was located under a different faculty: Industrial Design Department under the Faculty of Architecture at a formerly polytechnic university, Interaction Design at the School of Arts and Communication at the Faculty of Culture and Society at a Scandinavian university college (now university), and now Industrial Design (as my PhD studentship contract indicates) at the School of Design under the Faculty of Arts, Design and Social Sciences at a university that was formerly polytechnic. Although they all have university status now, each of these schools was once a 'vocational' school, which traditionally put less emphasis on the academic and more on the vocational and technical aspects of the degrees taught. Ironically, each of these institutions had quite strong research traditions particularly in design as if compensating for the lack of 'status'.

my view and partial perspective on design through this piece of situated knowledge²⁷ I contribute to the literature: Despite feeling somewhat of a 'misfit' throughout my training as a designer, I've felt home with design research for its concern to understand design in its efforts to make a change in the world. Maybe I am a case of 'those who can't do, teach' and I have no problems with it: I acknowledge the different traits, skills and priorities involved in the practices of design, practice-based design research, design research and design education that may initially seem to be different facets of design, whereas each of these endeavours prioritise and make use of different skills and ambitions. Making a change in the world through design has felt too ambitious and perhaps a little self-important, but facilitating change is something I have always been keen about.

Yet, I soon found out that research hasn't exactly been a home to design as I knew, understood and practiced it. The disciplinary anxieties were indeed created and sustained for discouraging design researchers from becoming insiders to academia, unless they fitted in with the prior expectations. Rather than perceiving disciplinarity as a starting point for potentially new configurations of research, researchers have been disciplined for 'research' and the division of intellectual labour. Decades of design research striving for design theory rather than prioritising meaningful ways of engaging with the world is a symptom of that. Design continues to fall behind in its disciplinary project, but this could be taken more as a blessing than a shortcoming in the face of contemporary problems of increasing complexity.

In fact, design is a relatively undiscovered research territory for it is a rather recent phenomenon in comparison to many other disciplines (Davis, 2008). As a result, every PhD student occupies a unique and contingent space that emerges throughout the process, potentially leading to a novel methodological

²⁷ Haraway's 'situated knowledge' criticised the false sense of objectivity in knowledge production as "the god trick of seeing everything from nowhere" (1988, p. 581). It resonates a lot with approaches to qualitative research and even more with design research. Situated knowledge further emphasises the direct relationship between the knowledge and its knower rather than bracketing them off.

approach or even a ‘program’ in the longer term. On the other hand, the notion of design program has made me wonder since I’ve encountered the concept – where would I fall in the transitions in-between? Even though design program is a proposition than a definition of transitional design theory (Redström, 2017), how do we draw its boundaries? Should design aim to avoid demarcation that led to the traditional division of knowledge and its disciplinary agnosticism (Klein, 1990; Davis, 2008)? Should it leverage its relationality to continue relating people, disciplines, concepts, approaches, ‘worlds’? Most importantly, am I coming from a place for concern or care? It’s not up to me or within my capacity to decide on the future directions of Design Research, but I’d urge anyone funded by public money to prioritise real-world problems over anything else if we want design research to matter. We need more self-reflections on why and how we are *becoming a design researcher*²⁸.

1.7 Publications from this Thesis

There is only one publication from this thesis, which is a CHI paper (Appendix C). It reported on the findings of the first interview study I conducted with individual design researchers on how and why they used Probes as part of their design-led research in HCI. The study explored further directions in understanding the implicit aspects of design-led research in HCI. The submission took place before I had the current matured understanding of my topic, therefore, there are many things I’d have changed regarding the published paper. However, given that this research is indeed about ‘becoming a design researcher’, specifically in the HCI context where CHI papers are more valued over any other venue or format, the experience was not only a ‘rite of passage’, but also helped me experience first-hand the implicit aspects of conducting design-led research or talking about design in HCI to empathise with the study participants of my research.

²⁸ I could not delve into design research from contexts outside the Eurocentric ones as much as I’d have liked within the constraints of this thesis. This is due to the Eurocentric origins of design research, which is what this research is concerned with. Moreover, the discourse on design is shaped by the Eurocentricity of design research even outside these contexts. This is why I emphasise *becoming a design researcher* over the theoretical and methodological discussions around design research and acknowledge the partial view I am providing in this thesis.

The goal of our CHI paper titled “How design researchers interpret Probes”²⁹ (Çerçi et al., 2021) was to nuance the umbrella term of ‘Probes’ and design-led approaches to research in HCI as a reaction against the dissemination practices methodising them. We further aimed to accentuate the plurality of design researcher identities in HCI and that design sensibility was not unique to the discipline of design as the claims in early design research to distinct “designerly ways of knowing” suggest (Cross, 1982).

The experience has helped me understand the vast scale of HCI and especially the CHI venue. Despite a decrease in the number of submissions in comparison to CHI 2020, CHI 2021 conference received 2844 paper submissions³⁰, out of which 747 was accepted³¹ and presented virtually over the course of several days. I’ve reached a better understanding of why and how design researchers tend to self-organise themselves around certain terms, practices, tracks etc as a way of coping with the scale of CHI³². Furthermore, in the light of the literature and my own experience of preparing the presentation for the conference, I’ve observed two factors that could potentially catalyse how a CHI paper gains traction. Firstly, the ‘invisible colleges’³³ of design-led research in HCI became more visible in this annual and global event, especially in the all-virtual one I’ve got to attend due to Covid-19 circumstances. Secondly, the presentations played a role beyond merely presenting the research findings to allure the audience into reading the

²⁹ Despite the strong reference to “How HCI Interprets the Probes” (Boehner et al., 2007) in our paper titled “How Design Researchers Interpret Probes” (Çerçi et al., 2021), we chose to drop ‘the’ to accentuate how *the* Probes have been decontextualised and made into generic term that is familiar to most audiences in HCI.

³⁰ The 10% decrease as listed on the CHI 2021 website was possibly due to the impact of Covid-19 restrictions globally, for field research is essential to most design-led research. Data taken from <https://chi2021.acm.org/information/4470.html>.

³¹ <https://sigchi.org/conferences/conference-history/chi/>

³² I acknowledge the potential differences to the virtual and in-person CHI experience. Even though I ended up presenting my paper in the virtual CHI conference and missed out on significant aspects of being a first-time presenter, I was lucky enough to attend CHI 2019 in Glasgow to experience it in-person. Its scale was overwhelming even for a mere attendant like I had been back then.

³³ Invisible college describes a small community of interacting scholars within their unofficial networks in a field of study. They are said to set norms around key aspects of how research comes to be by influencing research orientation, social interactions, citation practices beyond an individual level.

paper to potentially lead to being cited. Of course, I had been given the suggestion of '5 takeaway narrative' in presentation as an efficient strategy to do so. I adopted it as a 'newcomer' for I presented our paper before conducting the second study in this thesis, upon which I have grown more critical of this style of presentation. All of these are indeed part of the implicit knowledge and practices around becoming a design researcher in HCI.

Throughout this process, I also found out about the implicit ranking of the two main HCI venues for design, CHI and DIS, for 'research prestige'. Due to the submission calendars and the different foci of the two, it has been common practice to submit paper submissions to CHI and then edit and re-submit to DIS if not accepted. Unlike DIS that yields an acceptance/rejection, CHI (at the time of our published paper) had a rebuttal process in which the reviews and the changes made to a submission never gets published along with the submission. I happened to follow a rather unusual path as such, for I have initially submitted the study findings to DIS and reworked the narrative to submit to CHI upon rejection. As a result, the submission had gone through a two-step modification before its eventual publication. I reworked not just the narrative, but the analysis itself for presenting the findings in this thesis. However, the experience has been helpful for me to understand the processes behind and the implicit practices around the HCI research dissemination. Qualitative research is said to centre empathy and unfold based on positionality, with meanings potentially changing once shifting to an insider position from an outsider one (Bryman, 2016, pp. 393-394). Therefore, it has also helped me connect better to the experiences of the participants of my second study.

Chapter 2 – Literature Review I:

The Disciplinary Project of Design

Introducing this chapter

How did design research come to be? What did the differing perspectives on design mean for the ways design has been understood, practiced, taught, and researched? How were these impacted by the changes in the broader contexts of design, research, and academia?

There has been no shortage of positions and perspectives on design research throughout its progression over several decades since its designation as an autonomous discipline. Each of these contributed to different design research traditions that are still around today. While some may have developed their own institutional histories of design research, there remains a lack of contextualisation for how and why these emerged within the totality of design research.

In this chapter, I will be exploring some of the taken-for-granted aspects of how design research came to be. My goal is to uncover some of the tensions resulting from both the internal and external politics of design research. Apart from the conventional resources on design research, I will further draw from my own experiences and prior domain of knowledge as an industrial design student, as well as grey literature, anecdotes, obituaries, online articles, and institutional websites. I will reconstruct a historical narrative for design research and situate the emergence of the term 'Research through Design' in its material history. In doing so, I will emphasise the term's influence as a means of positioning oneself in the broad range of design research traditions rather than indicating a practice-based design research methodology.

Key Concepts

Division of labour
Scientific management
Minor professions
Design school
Design methodology
Design historiography
Design research
Designerly ways of knowing
Design thinking
Design methods
Problem-solving
Wicked problems
Knowledge production
Knowledge transfer
Research prestige
Research & development
Practice-based research
Research into/through/for art & design
Methodological pluralism
Methodological innovation
Scientific method
Qualitative research
Methodological bricolage
Methodological templates

Chapter 2 – Literature Review I:

The Disciplinary Project of Design

In this chapter, I will reconstruct a narrative for how practice-based design research came to be in order to situate RtD in its material history. Tonkinwise (2017) identified 3 levels to the inclusion of practice-based design research in academia as disciplinary, institutional and paradigmatic respectively. Instead, I focused on how the meaning of design has changed throughout design education before design research (section 2.1), the beginnings of design research (section 2.2), and later when academia became more inclusive of newer modes of knowledge production (section 2.3). In order to be able to refer to my own experiences and prior domain of knowledge on the topic, I mostly addressed industrial design (sometimes interchangeably used with product design with nuances in-between).

2.1. Design Before Design Research

A degree in design may be a relatively new phenomenon, a doctoral degree in design is even newer. Long before the inclusion of design in academia as a research discipline, design existed rather happily in its undisciplined divergence at the vocational design schools across different geographies. This should not be understood as a lack of tensions, conflicting views and ideologies in-between these design schools. Indeed, much like the artistic movements and their reactionary emergence to their predecessors, these design schools looked back at what came before them when developing their own approach to design. Most importantly, they emerged from the contingent material conditions that justified how they came to be and their approach to design and design education. They were rather autonomous of each other, which meant that they did not have to worry about the collective landscape of design as a discipline when developing their unique approach and curricula. I will not go into the details of design before design research in this section that goes all the way to antiquity long before these design schools (Bürdek, 2005) and has its origins particularly in crafts (Frayling, 2012), but I will point out to

these schools' influence on design in the term we understand it today. Especially that of the Bauhaus and the Ulm School of Design for their impact on the broader context of design, as well as the development of design research.

I wanted to go as far back, in part because Bauhaus remains an ideal in the contemporary design discourse for guiding the aspirations of a design school, especially in regard to its positioning and responsiveness to the society. Furthermore, I wanted to understand how design took on the wide range of contextual meanings it has today besides the semantic ambiguity of the word itself. For example, I was curious about how design has been increasingly associated with privilege from its origins in the handiwork of humble, anonymous craftspeople. Similarly, I was interested in the legitimisation processes behind design's transitioning from being the child of the 'Golden Age of Capitalism' into a knowledge domain and how it potentially created new knowledge economies of design³⁴. In doing so, I was able to understand the ways the value of design research was sometimes mistaken for the value it created, or was used as a means of value proposition.

2.1.1 Division of labour and the design school

First of all, we need to understand how the design school came to be. Short answer to this is the market demand for a specialist designer. The long answer is the Industrial Revolution brought a division of labour in manufacturing products and created the demand for 'industrial designers' as coined by Mart Stam in 1948 (Hirdina, 1988 in Bürdek, 2005). According to Stam, an industrial designer drafted, sketched and planned within any area of industry, unlike the craftspeople who could both design and manufacture a product they specialised in. The separation of design and manufacturing as such can be

³⁴ In his book titled "Economies of Design", Guy Julier (2017) has explored the deep-rooted connections between the rise of design since the 1980s and the economic turn to neoliberalism. He addressed the oft-attributed yet taken-for-granted complexity of design; specifically how the relationality of design creates new, sometimes informal economies that further contribute to its flux to take on new meanings. To put simply, "how finance is materialised through design" (Julier, 2017, p. 166) rather than ideas, morality, or preferable futures as often ascribed.

considered to be a form of deskilling. However, the potential employability of the industrial designer in any industry also required re-skilling in a wider range of new skills and knowledge domains. As such, industrial design was a new kind of specialism in contrast to that of craftsmanship, a specialism that was indeed generalist in essence. In order to meet the market demands, the design school was born as a vocational school than having university status. While some may have able to grant a degree in design and conducted research, it was to cater to the needs of design pedagogy than locating design as a mode of knowledge production. Therefore, design schools started borrowing from other domains, engaging different practices and teaching methods in order to equip the industrial designers for their emerging role in the local society. As such, it was too erratic to potentially make into a coherent discipline.

2.1.2 Bauhaus model and its positioning of art, design, and crafts

Out of these design schools, Bauhaus has been the most influential to what followed and maintains its relevance today that is manifested in Frayling's (2012) essays "towards a new Bauhaus" or new design initiatives to tackle contemporary problems like the "New European Bauhaus of the Seas" (European Commission, 2021). The Bauhaus School was founded in 1919 by Walter Gropius, a German-American architect. Its education program was modelled on an understanding of design as uniting art and technology, which positioned the designer closer to an artist, while remaining loyal to the crafts origin of design (Moline, 2019). Hence, the deliberate blurring of the boundaries between art and design in early design education has been named the "Bauhaus model" (Findeli, 2001; Lerner, 2005). Teaching was conducted by both craftspeople and artists in a master-apprentice model in its earlier phases, although "in practice it soon became clear that the craftsmen were subordinate to the artists" that led to "[p]ervasive social tensions" (Bürdek, 2005, p. 31). In the latter phases, the social stance turned increasingly to functionality that set a modernist understanding of the design as the norm. Bürdek wrote: "Function always meant a combination of two factors in design, marrying the conditions of industrial manufacturing (technology, construction

methods, materials) with the social conditions, in the service of the needs of the broader population and the requirements of social planning” (2005, p. 31). This meant that the original concept of an art academy was eschewed and soon after the school was dismantled by the Nazis in 1933. Findeli (2001) argued that throughout its different phases, the school moved on from a polar understanding of art/technology to a threefold one of technology/art/science, and finally into the polar structure of practice/theory that informed their curriculum. The changing circumstances the school was in and therefore the change in ideologies over the years obfuscated design’s heritage from crafts. As such, by founding The Bauhaus School, “Gropius thus laid the groundwork for the transformation in vocational practice that turned the traditional artisan craftsman into the modern industrial designer” (Bürdek, 2005, p. 37). Near its closure, the school further positioned design away from the arts towards a modernist, functionalist understanding of design. This understanding of design would evade critical interrogation and dominate design practices and studies for a long time.

2.1.3 Ulm model: Towards a design methodology

Many years later, the Ulm School was founded partly by the graduates of the Bauhaus tradition in 1953 in post-war Germany to form the basis of modernist understandings of design that is often taken for granted in design research. The school initially assumed a culturally constructive role with an explicit reference to its Bauhaus heritage and the artistic educational background of its appointed lecturers and rector Max Bill (Spitz, 2001 in Bürdek, 2005). However, acknowledging the role of designers in production to improve the post-war German economy, the School’s education would soon become more vocational and responsive to the needs of industry. Under Maldonado’s rectorship, what is known to be the ‘Ulm model’ was developed, which made use of experimental pedagogy and overt relations with the industry. As part of this model, the Ulm School “only had an instrumental interest in the knowledge of art, for instance, in its application in foundation course projects” (Bürdek, 2005, p. 45) in order to train designers’ perception and manual precision and not even as applied art. Its educational philosophy was founded on ‘scientific

operationalism' (Maldonado, 1958 in Findeli, 2001) towards a scientific re-orientation of design, further removing the traces of arts and crafts in design and design education. Positioning design closely to applied science with a scientific rationality, the Ulm curriculum looked only to the 'exact' sciences to borrow methods and approaches (Maldonado & Bonsiepe, 1964 in Bürdek, 2005). Their contribution to the common repertoire of the design profession today include the notion of 'problem', and the use of analysis and synthesis to develop 'alternatives' as part of 'design methodology' (Bürdek, 2005). By positioning design away from the messiness of artistic and crafts practices, the Ulm approach to design education was much more suitable for formalisation. Combined with the popularity of its graduates in industry, the Ulm model became a reference model for many other design schools throughout the world (Bürdek, 2005). As the vocational design schools that adopted a version of the Ulm model gained university status within the gradual academisation of design, Ulm's inherent influence continued even after the school's closure in 1968. For example, as I will elaborate later in section 2.2.2, the influence of Ulm School and its 'design methodology' was particularly evident for the 'Design Methods Movement' in the early beginnings of design research for two of its founders, Bruce Archer and Horst Rittel³⁵, were lecturers at the Ulm School prior to its closure.

2.1.4 The disciplinary project of design

Of course, these two schools were not the only design schools across the world, but they became the most influential for the fitness of their educational models for the disciplinary project of design throughout its academisation. When we look at the long-term progression of their ideas in response to the changing circumstances, we can see how disciplining design makes a modernist success story: If disciplined, design can be made useful for the society rather than remaining tacit and therefore exclusive or even elite. The disciplining of design entailed taking it from a broader set of understandings and its messy and diverse contexts of practice into a formalised, standardised,

³⁵ The others were John Chris Jones and Christopher Alexander.

scientific, *utilitarian* model of knowledge transfer. Such model was able to absorb, if not prevent any divergence before it happened in order to ensure the advancement of the disciplinary project of design. The surviving divergences were pushed to the periphery, where they could maintain their independence and locality from the disciplinary project of design. With design education moulding designers to become a workforce in their pre-determined role for the societal progress, the design school would be justified by positioning design in relation to society and giving a purpose to design education. Despite its original critical stance in doing so, the Ulm School has become a sort of cautionary tale for the design school: It lost its funding and relevance to knowledge production upon becoming too vocational and highly responsive to the needs of industry (Spitz, 2001 in Bürdek, 2005). On that note, Bürdek wrote:

“Quite apart from all the often-cited political reasons, the School also failed because after the mid-1960s it was unable to generate modern concepts and ideas. The critique of functionalism that arose at that time and the debate over ecological questions that took off a little later fell on deaf ears at the School. The institutes, in particular, had become so strongly commercialised through industrial projects that many lecturers could no longer be said to possess independence and critical detachment. Once the Ulm style had finally been established, it proved impossible to resist the temptation to reap the rewards in industry. These entanglements made it impossible to find solutions that would have satisfied the massive demands made by students at the same time: demands for work to be socially relevant and for colleges and universities to maintain academic independence.” (2005, p. 47).

2.1.5 Marginalisation of arts and crafts in design

By rationalising the design process for easier knowledge transfer in design pedagogy, the Ulm School contributed to the detachment of design from arts and crafts³⁶. Arts and crafts were then devalued and even made into a taboo in regard to design, which is under-acknowledged within the design-led research contexts. The devaluation of crafts had started back at the Bauhaus when the educators of crafts background were subordinated to those of artistic

³⁶ My use of arts and crafts in regards to design indicates approaches grounding design in arts and crafts rather than the “Arts & Crafts” movement in 19th century Britain.

background on the premise of creativity and visionariness. Around the same time, the criminalisation of ornament was taking place throughout the rest of Europe. Viennese architect Adolf Loos' 1910 criticism of handicrafts for their unsuitability for industrial methods of production was also a criticism for the increasingly deteriorating working conditions of craftspeople that reduced the scope of their crafts into ornamentation (Loos, 2019). Yet in his juxtaposition of "Ornament and Crime" in the title of his essay, he facilitated the criminalisation of arts and crafts in all design domains, including architecture and interior design. In moralising rational design on the basis of utility, arts and crafts and anything that did not meet that criterion was immoralised. When Ulm further pushed design away from the arts through its merely instrumental use of art in the foundation courses and re-oriented design toward the sciences, this soon became a norm in design. Indeed, the Ulm School's product design department adhered to a strict functionality that was moralised in terms of how the school positioned itself in relation to the society: "Objects that possessed an artistic or craft character were more or less taboo, nor was the design of prestige and luxury items part of the task definition of the Product Design Department" (Bürdek, 2005, p. 50).

As such, ideology was reduced to a matter of aesthetics through the criminalisation of non-rational design that did not conform to the industrial means of production. Bauhaus designs were another example of "how the power of form becomes a form of power, or in other words: how the powerlessness of design can be a special (political) form of power" (Bürdek, 2005, p. 104). Even though the Bauhaus designs were not influential to the mass culture of its time in the 1930s, the political connotation of the style led to its intellectual and symbolic consumption amongst the elite to maintain its stylistic influence into modern design (Bittner, 2003 in Bürdek, 2005). So, while arts and crafts were marginalised, the aesthetics of functionalism were further dignified, or even fetishised, for the underlying ideology made implicit into stylistic references. On that note, Bürdek noted:

"Loos's ideas had their first heyday during the Bauhaus period. The design approach and methodology developed there was understood as

overcoming styles, although in fact, their strict application gave rise to a new style, which became the symbol of a small intellectual and progressive stratum of the population, who demonstrated it in their houses and apartments through tubular steel furniture and spartan bookcases.” (2005, p. 59).

2.1.6 Dissent and divergence: The art school ethos in design

The marginalisation of arts and crafts due to the domination of functionalism and the formalisation of design knowledge within the disciplinary project of design moved these practices to design’s periphery. Arts and crafts approaches to design found a new home mainly at independent art schools, because these schools maintained the master-apprentice educational model that was more suitable for the transfer of tacit knowledge involved in these practices. In these schools, design pre-existed the disciplinary project of design in the form of artistic practices, so it was rather natural for design to become a part of the art school ethos. Based on Frith & Horne’s (1987) sociological analysis of British art and design school culture, Julier argued that “the art school ethos separates itself from other educational cultures and actively resists incorporation into the mainstream” (2008, p. 45).

In doing so, a Romantic, marginal vision of design is promoted and celebrated “as a sales technique, a source of celebrity” (Frith & Horne, 1987, p. 30). Unlike the humble craftspeople, designers of such privileged status are said to “only half-heartedly aspire to a *conservative* professional status” (Julier, 2008, p. 45, emphasis in original). I will elaborate on how the inclusion of these art schools in the third-cycle higher education to grant doctoral degrees in design created the optimal conditions for an art-based critique of design in section 8.2.1. However, for now, I’d like to conclude with Julier’s (2008) remark that the predominantly fine art-based traditions of representing design can be indeed traced back to the art schools. The divergence of design practices were overlooked in the early beginnings of design research in favour of studying design to come up with an abstracted design methodology (section 2.2) until their inclusion as new modes of knowledge production in academia (section 2.3). As a result, the potentially critical and productive exchanges between

these divergent and broader understandings of design could not happen for a long time.

2.1.7 The plurality of design made implicit in the disciplinary project of design

Design's relational character can be clearly observed in the emergence of the Bauhaus and Ulm schools as a response to the specific material conditions and demands of their time. Both schools set out with an ideology that was also reflected through their unique understanding of what design is, the aesthetics of their design outcomes, as well as their approaches to teaching and positioning in relation to the society. This relationality resulted in a plurality of approaches to 'design school' even within the disciplinary project of design. As such, Julier identified design as a 'minor' profession that lacked a 'normative curricula' in its training, but stated that design has been harder to justify in comparison to the other minor professions like nursing (2008). Therefore, the justification of the design school has been dependent on the specific conditions of their geography, culture and socio-politics. For example, Paola Antonelli contrasts the different interpretations of design in northern Europe (including Germany, Great Britain, and Scandinavia) with those in Italy based on how the traditional boundaries between various design domains and art are often preserved in the first and crossed in the latter (Antonelli, 2001; Bürdek, 2005).

The differences to how design-related labour is divided and maintained across these locations is likely to stem from how the design schools positioned themselves differently in relation to their local industry. Moreover, as Ghajargar & Bardzell's (2019) genealogy of design education also suggested, individual design leaders and their unique visions often played an important role in how these schools positioned and further justified themselves within the disciplinary project of design. For example, I've so far touched upon how earlier Bauhaus was driven by Walter Gropius' vision and Ulm by Tomas Maldonado's. Similarly, the Royal College of Art in the UK has contributed to

design research in different ways under the leadership of Bruce Archer and Christopher Frayling, which I will be detailing in section 2.3.1.

Yet the project brought a sense of centre and periphery to design's disciplinarity. Those that were pushed to the periphery (e.g. art schools) for their divergence from the dominating approaches has developed in even more divergent ways from the centre. Once freed from the disciplinarity impositions for design that included compliance with the industry constraints, these design schools were able to develop their own approach to design, just as Bauhaus and Ulm once did. Their means of justification remained local and contingent as opposed to striving to collectively meet the academic criteria for disciplinarity as part of the disciplinary project of design for justification. The ideas and approaches from these two schools became widespread not only because of their better fit into the academic ideals of scientific research, but also extended their reach through the graduates perpetuating certain ideals, ideologies and practices around design.

However, the disciplinary project of design mostly removed the traces of these ideological references. In accordance with their reference models, many design schools adopted the instrumental use of art-based, artifact-focused design history to teach students good design from bad design (Julier, 2008). Art-based design historiography focuses on design stardom and the designed artifacts rather than the contexts of design and how they came to be (Dilnot, 1984a; Dilnot, 1984b; Heskett, 2016). As such, ideology was reduced down to a matter of aesthetics and the aesthetics of functionality became a proxy for 'good design'³⁷ without much regard for the local needs and desires. When its authority was further reinforced through dogmatic preaching of its principles, design students became more likely to internalise the aesthetics of

³⁷ I am referring to Dieter Rams' 10 Design Commandments that epitomised functionalism in design. These are: 1) Good design is innovative. 2) Good design makes a product useful. 3) Good design is aesthetic. 4) Good design makes a product understandable. 5) Good design is unobtrusive. 6) Good design is honest. 7) Good design is long-lasting, 8) Good design is thorough down to the last detail. 9) Good design is environmentally-friendly. 10) Good design is as little design as possible. Derived from: <https://www.vitsoe.com/gb/about/good-design>

functionality and its implicit ideology before they were able to develop a critical stance on design. The stylistic imitations at the design schools were likely to be perpetuated within the broader contexts of design upon the students' graduation. Over time, the plurality of design became less and less visible and was even made implicit in the disciplinary project of design. Within the disciplinary project of design, which was only included in the higher education to meet the market demand for specialised 'designers', the plurality of design wasn't even an issue for knowledge generation in design. It only became apparent when the disciplinary project of design was extended further onto design research as a mode of knowledge production. The vocational design schools gradually joined the centre of design research from its periphery throughout the heterogeneous academisation of design, which is when the plurality of design became not only apparent, but resulted in the conflict of the faculties, for design research has been dominated by technical disciplines until then.

2.2 The beginnings of design research: The re-invention of design methodology

2.2.1 Rationalising design processes for the industry to teach 'design methodology'

The worldwide economic expansion in the aftermath of World War II, often referred to as the 'postwar economic boom' or the 'Golden Age of Capitalism' (Marglin & Schor, 1991), quickly turned into an international competition of globalisation. Therefore, many industrialised European countries turned to design to increase the value of their industrially manufactured products. The success of the German consumer products manufacturer Braun helped spread the closely associated industrial designer Dieter Rams' notion of 'good design' across nations (e.g., *el buen diseño*, *bel design*, and *gute Form*) (Bürdek, 2005). The collaboration between Braun and the Ulm School has further led to development of the "Braun style", as explained by Maldonado:

"the style differed from Olivetti who sought unity in variety, while the style of Braun sought unity in the product and its coherence with other products. Because of this, the Braun-HfG collaboration was a formidable test bench for the design of 'honest' form and coherent identity as an alternative to the random 'styling' of individual objects." (1977, p. 77)

Here we can see how the materialisation of a specific ideology and interpretation of design was proxied into a stylistic 'ideal', as something to aspire to in design wherever the reach of Braun's success story could extend. Maldonado's association of 'honesty' with Braun's coherent product range in contrast to what he refers to as 'random styling' of Olivetti designs epitomised the peak of rationalisation in design in northern Europe and its dissent from the Italian tradition. 'Random styling' has a derogatory connotation even when talking about design today for it postulates a kind of 'laziness' and even 'indifference', as well as reducing the scope of design from a thorough and holistic process into mere 'styling'.

Hence, it became impossible for industrial designers to engage with the subjective and emotional in design as in the arts and crafts tradition in order to be taken seriously: "It was thus an obvious step for designers to try to integrate scientific methods into the design process so that they could be accepted as serious partners in the sphere of industry" (Bürdek, 2005, p. 226). The Ulm School thus facilitated the conversion of design practices into rationalised processes to cater to the needs of industry through the creation of a 'design methodology' in design education. As such, "methodology has more the character of didactic meaning than of a patented recipe – although the latter misunderstanding has proven persistent" (Bürdek, 2005, p. 226). The design methodology from the Ulm School was not intended to represent how to tackle a design problem, but aimed to somewhat formalise the tacit knowledge of a particular understanding of design for faster and more efficient knowledge transfer than the previously master-apprentice approach to teaching design and related practices.

On the practice side, the domination of functionalism and methodological approaches to teaching design behind the notion of 'good design' went unchallenged until the 1970s. I have previously mentioned that design was

interpreted and positioned within the division of labour differently in Italy than in the northern European countries (section 2.1.7). This broader and freer scope of design in Italy enabled design studios like Superstudio and Archizoom and other groups to develop a critical stance to design following the radical and critical ideas of the 1960s. For example, they developed a new category of design named “concept design”, which prioritised the intellectuality of a design idea than its applicability to serve the industry or its user (Brockhaus Enzyklopädie, 1987 in Bürdek, 2005). They further developed anti-design ideologies in response to design’s involvement in the Golden Age of Capitalism. Especially Superstudio explored and proposed alternative roles for design as a mode of cultural criticism, which dates the emergence of critical stances to design long before Dunne & Raby’s ‘Critical Design’³⁸ within the contexts of practice-based design research. Anti-design ideology was encapsulated in the following text by Superstudio co-founder Adolfo Natalini:

“...if design is merely an inducement to consume, then we must reject design; if architecture is merely the codifying of bourgeois model of ownership and society, then we must reject architecture; if architecture and town planning is merely the formalisation of present unjust social divisions, then we must reject town planning and its cities...until all design activities are aimed towards meeting primary needs. Until then, design must disappear. We can live without architecture...” (Natalini, 1971 in Didero, 2017).

2.2.2 Design research as a machine for problem-solving

In the previous section, I’ve explained how design processes and teaching was rationalised and methodised to meet the demands of industrial production. Within the Fordist means of production, workers were subjected to ‘scientific management’ of the division of labour in the assembly-line, which was standardised and regimented. With the production broken down into small and standardised tasks throughout in an assembly line, the sum of its parts

³⁸ Anthony Dunne introduced what he termed ‘critical design’ in his book titled “Hertzian Tales” (2008), first published in 1999, as a form of design practice that rejects the conventional roles attributed to design as developed by himself and Fiona Raby at the Royal College of Art (RCA) in the UK. It has later become an umbrella term for any design practice operating outside a problem-solving paradigm, especially in the academic design practices that try to explore new roles for design. See Malpass’ book titled “Critical Design in Context: History, Theory, and Practice” (2017) for a detailed account of critical design.

made the whole indeed. Despite its transformation of workers into a cog in the machine through undignified deskilling and diminished job autonomy, it was an efficient means of industrial production. In order to make industrial designers fit into this means of production, a similar rationalisation of design processes and the methodological teaching of design was necessary. Thus, designers were also transformed into a relatively more skilled cog in the machine as industrial designers to increase the efficiency of the production and add aesthetic value to the products. This was the industry practice side of design meanwhile design research was beginning to find its place in academia from a much broader perspective than the industrial design practices. Design research was both a result of and a response to the challenges brought by the World War II. This was expressed by Horst Rittel³⁹ in an interview in 1972:

“The reason for the emergence of design methods in the late ‘50s and early ‘60s was the idea that the ways in which the large-scale NASA and military-type technological problems had been approached might profitably be transferred into civilian or other design areas.” (in Bayazit, 2004).

This quote indicated Rittel’s presumptions and the opportunistic *Zeitgeist*⁴⁰ of the time that understood design was a methodology that could be scaled up and down, made portable for applicability in other areas for profit rather than benefit. The idea of design as instrumentalised problem-solving was born to tackle the social and economic problems in the aftermath of World War II. To a person with a hammer, everything looks like a nail. So, it brought a new way of looking at the world as a set of design problems to be determined, rationalised, divided and conquered to make profit. Combined with the need to “move faster and faster to reconstruct Europe from its rubble” (Bayazit, 2004, p. 22), design research attracted many disciplines, including industrial designers, engineers, psychologists, statisticians, architects amongst many more. Anyone who was interested in future studies and ‘building’ found a place in design research.

³⁹ Horst Rittel was originally trained as a mathematician and physicist, but his fascination with design and planning shifted his career towards teaching design methodology at the Ulm School of Design amongst many more influential design schools. For more information on Rittel, see Rith & Dubberly (2007).

⁴⁰ *Zeitgeist* means the spirit of the age for a given epoch in world history.

The Royal College of Art (RCA) in the UK at the time already had a 'Design Research Unit'⁴¹ that was founded in 1943 in anticipation of the post-war needs for industrial design and engineering (Bürdek, 2005). Bruce Archer, who had been promoting a rational approach to design within the institution, facilitated RCA's engagement in the emerging 'design methods movement'⁴² (Margolin, 2016). For example, he categorised design as the third domain of education and knowledge after science and the humanities (Archer, 1979). This idea was then picked up by Nigel Cross of Open University for the distinct "designerly ways of knowing" (Cross, 1982), which laid the foundations for the popular notion of "design thinking" within and outside academia. Design Research Society (DRS) was founded in 1966 in the UK to bring design

⁴¹ Founded by architect Sir Misha Black, art critic Herbert Read, and graphic designer Milner Gray, 'Design Research Unit' was the first multidisciplinary design agency of Britain and contributed to the iconic and ubiquitous designs across the country, ranging from the British Rail logo to the street signs in London. Design critic and curator Justin McGuirk wrote: "These details are so implicit in the scenography of Britain that we barely notice them" (2010). He further noted that design played an important role in rebranding of Britain as the welfare state "desperate to break with the past" in the optimistic post-war setting (ibid). The same people previously had helped establish the Society of Industrial Artists (SIA) in 1930 as the first professional body for design in Britain that "sought to carve out a professional status for the designer alongside the architect and engineer" (Armstrong, 2016, p. 161). It was named as such, because at the time, the word 'Designer' was not used in Britain (Woodham, 1997, p. 167). 'Industrial artist' or 'commercial artist' was more commonly used than 'designer'. Atkinson noted how Misha Black himself was self-conscious of the 'rather pathetic, lowly status of designers' in comparison to these other professions (2021). Therefore, it has been argued that the professionalisation of design through the establishment of such organisations was "a 'social project' driven by the desire for greater social and economic status and self-improvement" (Armstrong, 2015, p. 164). Perhaps 'Design Research Unit' was born out of a desire to further improve design's reputation.

⁴² Originally a mechanical engineer, this statement by Bruce Archer encapsulates his approach to design: "I was saved, I heard of industrial design. I could be an artist and an engineer at one and the same time." His understanding was closely aligned with that of the Ulm School under Maldonado's leadership. In fact, Archer was offered a job by Maldonado to act "as a bridge between two rival factions at the school" as artists and scientists. When Misha Black was appointed Head of Industrial Design at RCA in 1961, Bruce Archer was hired to lead a research project titled "Studies in the Function and Design of Non-surgical Hospital Equipment" as part of the 'Design Research Unit'. However, the collaboration ended badly, for it revealed the biases against an art school at the time, no matter how 'royal' it may be. Despite the wide scope of potential design problems identified by Archer, they did not comply with the stakeholders' expectations from designers of an art school. Perhaps because of such experiences and also his background as an engineer, Archer was increasingly diverging from 'Design Research Unit's original positioning of art & design towards the emerging methodological approaches to design at the time. As a result, he was appointed the head of another department at RCA named 'Industrial Design (Engineering) Research Unit'. So, it was not the original 'Design Research Unit' of RCA that engaged with the 'design methods movement' in early design research. For a more detailed account of Bruce Archer, see the obituary written by Dr Sebastian Macmillan: <https://www.independent.co.uk/news/obituaries/professor-bruce-archer-491278.html>

research across disciplines together with the purpose of promoting “the study of and research into the process of designing in all its many fields”⁴³.

The notion of “design thinking”⁴⁴ helped coalesce the existing divergences in design domains and practices across disciplines back then (Buchanan, 1992). Approaching the black-box of design process from a methodological perspective, it gave rise to the ‘design methods’ movement in the early beginnings of design research with great expectations (Margolin, 2010). These expectations included developing a design theory, not only for transferability, but also to potentially justify and ensure the ‘research prestige’ of design research. Similar to Le Corbusier’s modernist framing of a house as “a machine for living” (Le Corbusier, 1927) as an efficient tool than a home, design research was made into a machine for problem-solving. While the technological developments of the war had already advantaged the engineers in terms of progression in that strand of design research, in the shortage of housing in the aftermath of the war had catalysed design research in architecture disciplines⁴⁵ (Bayazit, 2004). It was only when the scope of design research was extended from macro-scale projects of housing and engineering systems onto smaller products, for example to increase efficiency in the workplace⁴⁶, industrial designers were admitted into the research domain of their own practices.

The methodisation of design did not happen linearly within design research that brought in different epistemological perspectives into design. The

⁴³ Taken from DRS website: <https://www.designresearchsociety.org/cpages/about>

⁴⁴ Of course, before its commercialised adoption by the industry. See Buchanan (1992); Kimbell (2011); Kimbell (2012); Iskander (2018); Irani (2018) for a detailed discussion of ‘design thinking’.

⁴⁵ As a result, some key design research developments came from architecture and urban planning, including the establishment of industrial or product design departments as part of the faculties of architecture in polytechnic universities by lecturers of these backgrounds. I briefly talked about my background in section 1.6, but at this point I should note that I began my design training at the ‘Industrial Design’ department that was indeed founded by Bayazit, an architect, in 1993 as part of the Faculty of Architecture in Istanbul Technical University in Turkey. Er & Bayazit provided a more nuanced account of why industrial design was “forced into the schools of architecture” as such (1999, p. 37).

⁴⁶ Bayazit (2004) exemplified that the introduction of more ergonomically-designed chairs and the scientific management of workplaces in the 1950s gave workers a healthier environment. In return, their wellbeing increased their efficiency in the workplace to extend the scope of design research further onto these smaller problems.

necessity to consider human needs rather than mere construction of artifacts differentiated 'design method' (Jerrard et al., 1999). By locating innovation in the method itself, as well as the potential product, a race to develop design methods began. Bayazit stated that in the first 'Conference on Design Methods' in 1963, the proposed methods were "simplistic in character" (2004, p. 18). She further added: "Everyone was systematizing his or her own approach to design, and externalizing it as design method" (ibid.).

The initial desire to rationalise and optimise the decision-making in design, which would be later referred to as 'scientific design' (Cross, 1993; Cross, 2001), was soon found to be incapable of solving complex, real-world problems through the abstraction of the method. When Rittel proposed a 'generational' approach to design methods (1973) and attributed a 'wicked' nature to some design problems⁴⁷, design methodology was "temporarily saved" (Cross, 1993, p. 16) by the reforms towards a second generation of design methods. On the other hand, Christopher Jones and Christopher Alexander, the two pioneers and 'experts' of design methodology completely rejected the idea in the 1970s. This turned the first-generation methods into a subculture, adding to the confusion of newcomers arriving at the field (Rittel, 1972 in Bayazit, 2004).

By then, the different epistemological camps were distinguished across design research as behaviourists "representing a mechanised, quantified view of design" and existentialist/phenomenologists concerned "with the humanness" of human beings as identified by Broadbent in 1967 (Bayazit, 2004, p. 19)⁴⁸. The lack of clarity between design method and design methodology was aggravated by the variance to their ends across design research communities.

⁴⁷ In his influential work, Rittel (1973) identified two kinds of problems in relation to design and planning as tame and wicked. To put simply, 'wicked' refers to a complexity and indeterminacy of a problem that resists any definition as opposed to the simplicity of a 'tame' problem. Any potential solution to a wicked problem is likely to create a new problem. As a result, there can be no single solution or even closure to the wicked problems, hence the difficulty in evaluating the potential solutions as right/wrong or good/bad in Horst & Rittel's framing. In my opinion, all design problems are wicked, but we haven't yet found out about the impact of our efforts to simplify them in order to generate solutions.

⁴⁸ Bayazit (2004) also referred to the existentialist/phenomenologists as 'formerly Marxist' in parentheses to indicate the school of thought these approaches were derived from.

This had not been the case for the Ulm School, because it had an explicit ideology and purpose to its 'design methodology' for teaching a specific understanding of design practice and it was openly guided by the vision of its leading figure at the time. Its goal for rationalising design for applicability and transferability remained local, partial and somewhat situated in comparison to the efforts of design research to rationalise design into a 'method' to transfer into a wider range of applications. Within the divergence of interests, ideologies, epistemologies in design research, perhaps the most important question for studying design and its rationality got lost in the spaces in-between: "whose rationality?"

2.2.3 Territorialising design research: Making boundaries to the 'artificial'

When Herbert Simon (1996) extended the scope of design onto the 'artificial', this idea was embraced within the various design communities for it helped justify design practices that was historically monopolised by engineering throughout the academisation of design⁴⁹. His rather abstract notion of design unlocked new interpretations of design beyond the construction of artifacts, buildings or systems. Simon wrote:

"Engineers are not the only professional designers. Everyone designs who devises courses of action aimed at changing existing situations into preferred ones. The intellectual activity that produces material artifacts is no different fundamentally from the one that prescribes remedies for a sick patient or the one that devises a new sales plan for a company or a social welfare policy for a state. Design, so construed, is the core of all professional training; it is the principal mark that distinguishes the professions from the sciences. Schools of engineering, as well as schools of architecture, business, education, law, and medicine, are all centrally concerned with the process of design." (1996, p. 111)

Such definition of design expanded its scope and further brought together a range of approaches to design like engineering and creative design under its

⁴⁹ Upon the marginalisation of arts and crafts, industrial design was understood mainly as 'shell design' and wasn't included in the design research, whereas design in the engineering sense was amongst the founding approaches to design research because the other approaches were not considered to be 'academic research' until decades later.

roof. At a time when only engineering design and humanities research into design was considered to be 'research' and the other approaches to design were part of 'experimental development' (Borgdorff, 2009; Borgdorff, 2012), design research started having a sense of research hierarchy within itself. This was also reflected in how Simon described design knowledge as "intellectually soft, intuitive, informal, and cook-booky" and called for "intellectually tough, analytic, formalizable, and teachable" to redeem the academic respectability it deserved as the science of the artificial (Simon, 1996, p. 112). As design problems and practices to tackle those problems differentiated into specialised domains beyond architecture and engineering design that dominated the early design research discourse, the overarching and generalist understanding of design was once again specialised. When design narrowed down to industrial design specialism from a broader understanding of arts and crafts, the scope of agency of the designer was reduced within the division of labour. This time, differentiation of design practices into domains left the broader 'design theorising' through these different practices unattended, for it would be only partial if a graphic designer was to theorise on product design or other domains of design.

The changes in the technological developments, such as the advent of personal computing, further led to re-shuffling the cards within design. Computer-aided design technology had already started interesting computer scientists with design in the 1960s, but they became especially involved in the systematic design methods and design science in the 1970s (Bayazit, 2004). It was within the emerging multidisciplinary field of Human-computer Interaction (HCI) that the new design domain of 'interaction design' was coined by Bill Moggridge and Bill Verplank in the mid-1980s. This new, even more uncharted design domain created a new race for territorialising design research and its creation of new methods for problem-solving. I will be elaborating on HCI and its changing dynamics around design in Chapter 3; however, I'd like to emphasise here once again the divergence of interaction design from the rest of the design discourse. The domain of interaction design emerged in and mostly remained within HCI and its dissemination venues. It is indeed a domain of computing research that concerns itself with the design

of digital artifacts, therefore, despite what the name suggests, interaction design research has been historically dominated by technical disciplines and scientific approaches to design. Arts & design practices and their approaches to research is a relatively new phenomenon in HCI research upon the inclusion of practice-based research in arts & design in academia. Hence, the re-territorialisation of interaction design as an inherently critical design domain matters to avoid repeating the mistakes of the early design research. Within the current academic context and its resources, HCI research is able to progress much faster with potentially more impact than early design research's aspiration to do so in order to reconstruct a post-war Europe. Instead, the focus on the field's disciplinarity leads to further fragmentation of design research within the field. Cross' reflection on the 50 years of the discipline of design offers some food for thought for any research that concerns itself with design:

“In PhD research in design, we need better, more focused research training and, instead of seeking novelty, there could be some useful attention to either confirming or refuting some of the early, single-case studies that are still relied upon as foundational evidence within our discipline. More broadly, I think the discipline of design could benefit from a much more progressive and coordinated research programme, rather than the fragmentation that seems evident today. It needs a solid, collective viewpoint instead of idiosyncratic, personal views of what constitutes design research; it needs significant leadership and an honest acknowledgement from people within the field that we are all still novices in design research” (2018, p. 707).

2.3 New modes of knowledge production in academia

2.3.1 Practice matters: Research through Art & Design

Frayling's (1993) *Research through Art & Design* marks an important milestone in design research as I have understood it in line with many other designer-turned-researchers. It is a particular moment within design's becoming that keeps on giving, for it has been the location of power struggles made implicit in design's ongoing transitioning into a knowledge domain. These struggles indeed date far back to vocational design and its means of justifying design education. Since the Bauhaus School of Design, art and

science have been depicted and positioned in binary as rivals to be able to argue for design as a way of uniting these incommensurable endeavours. Therefore, the disciplinary project of design has always been the location where the two is said to meet — and clash! In fact, the story behind the emergence of 'Research through Art & Design' specifically at the Royal College of Art also entails clash. According to Friedman (2008), the term 'Research through Art & Design' originated in a 'pamphlet' and has been one of the most cited papers in the design discourse, yet ironically enough, it is also one of the least read.

The paper originally suggested 3 different configurations to how research can be grounded in creative practices, which were research into/through/for art and design (Frayling, 1993). It was rather a work in progress, a quasi-framework for research in art & design, yet its influence on the broader domain of arts & design research made these terms ubiquitous wherever there was a concern for grounding research in practice. Perhaps the reason why the paper is not as read as it's cited was because its influence wasn't in the text itself, but in the potential opportunities it suggested, especially in the idea of research through art & design. It gained its importance for what it came to represent when situated in its material history and subsequent impact rather than the paper itself.

The importance of the term 'Research through Art & Design' indeed comes from its strategic timing and location, and of course, Sir Christopher Frayling⁵⁰. I have previously mentioned the 'Design Research Unit' at the Royal College of Art (RCA) and Bruce Archer's participation in the design methods movement

⁵⁰ Christopher Frayling joined RCA in 1979 as a Professor of Cultural History and was a Pro-Rector in 1992 when academia was going through changes to include artistic research. He helped rekindle the tradition for design research in RCA, which had been inactive since 1984. Due to the university's position as 'art school' and the strategic timing the proposal that coincided with the academic restructuring, his proposal positioned practice-based design research together with artistic research despite their nuances. He became the Rector in 1996 and was awarded with a knighthood in 2001 for his contributions to the academisation of art & design within and outside the UK. For more information, see: <https://www.rca.ac.uk/news-and-events/news/rca-honours-former-rector-frayling/>

in the early days of design research⁵¹. Continuing to be one of the most prestigious art and design schools around the world, Britain's Royal College of Art has been particularly central to the development of design research and education as we understand it today. This has been possible not only because of RCA's privileged status as a university⁵² long before the other design schools could become universities. In fact, it has been possible mostly because a "top-notch design-specific culture" flourished in the metropolitan London at the beginning of 21st century (Bürdek, 2005, p. 83), mainly due to the efforts of the UK's Design Council. Founded in 1944⁵³ as part of post-war economic recovery strategies, the 'Design Council' helped re-orient design as an added value to the national economy first and national identity later⁵⁴. Design was cherished for making up about 10% of the gross national product in the London region at the beginning of the 21st century (Bürdek, 2005, p. 83).

⁵¹ In fact, the department of design research at RCA was shut down in 1984 upon the appointment of Jocelyn Stevens as Rector. The decision was not based on performance, for the department had operated successfully for 25 years prior to its closing, but rather had to do with Stevens' personal view, as noted in his obituary:

<https://www.theguardian.com/media/2014/oct/14/sir-jocelyn-stevens>. As a result, Bruce Archer was re-assigned to the role of Director of Research across the different departments of the university for his existing connections with design research. For more information, see the obituary written by Dr Sebastian Macmillan:

<https://www.independent.co.uk/news/obituaries/professor-bruce-archer-491278.html>

⁵² The Royal College of Art was 'royally' given the status of an independent university to grant its own degrees in art and design in 1967, while other design schools were able to do so from 1992 onwards. RCA website has a nice little history that contextualises the school's milestones in response to the art and design developments of their time:

<https://www.rca.ac.uk/more/history/>

⁵³ Originally founded as the 'Council of Industrial Design' (COID) with a mission "to promote by all practicable means the improvement of design in the products of British industry", it continued to expand its scope to eventually change its name to the 'Design Council' in 1972.

A full timeline can be found their website: <https://www.designcouncil.org.uk/who-we-are/about-us/our-history/>

⁵⁴ Needless to say, this has inspired many other countries to start their own design council/centre to promote their existing and/or emerging design practices. For example, the German Design Council was founded in 1953, the Danish Design Centre was founded in 1978. The efforts of these helped create and promote a global brand image for their design and the export of their products, as well as a national design culture within for domestic consumption. For example, compare and contrast the common perceptions of 'German design' as functional, intelligent, long-lasting with that of 'Danish design' as sleek and sophisticated. Italy, on the other hand, had a different approach to branding, perhaps because of the "the worldwide dominance of Italian design" (Bürdek, 2005, p. 120). While they had a great variety of exhibits, catalogs, books, magazines and films that promoted Italian lifestyle, as well as the many Italian design brands across a wide range of design domains, they did not have a 'design council', but an Italian designers' association, ADI (Associazione per il Disegno Industriale), that was founded in 1956. In comparison to the standardising effect of these nation-wide design councils, Italy indeed embraced the cultural diversity and idiosyncrasies in design, as it was also noted by Antonelli (see section 2.1.7).

This has attracted more designers from all over the world, but also created a further demand for design, turning London into the ‘design hub’ of the world. For example, the origins and/or head offices of many international design agencies and consultancies can be traced back to London, including IDEO as the most well-known example. This context is important to understand how RCA came to include a ‘Design Research Unit’ since 1943, long before the start of any other efforts for ‘design research’. Moreover, its strategical location right in the centre of a blooming design economy and culture helps us understand why it became a ‘de facto’ authority throughout the transferral of design practices further into educational and research domains from the bottom-up, as opposed to studying design with a top-down approach in order to squeeze out a ‘design methodology’ as in the early beginnings of design research.

When the previously vocational design schools became universities, many turned to RCA because of its existing tradition for ‘design research’ and its rather pioneering status in the art & design education as a university. Until 1992, design was mostly taught as a vocational practice at engineering schools⁵⁵ or art schools (Broadbent & Davis, 1987; Melles, 2008a). As the global and local agendas for higher education started changing, the authority of the traditional notion of disciplinary knowledge was put under scrutiny (Limoges et al., 1994; Nowotny et al., 2003). The changing paradigm is explained as:

“The old paradigm of scientific discovery ('Mode 1') - characterised by the hegemony of theoretical or, at any rate, experimental science; by an internally-driven taxonomy of disciplines; and by the autonomy of scientists and their host institutions, the universities - was being superseded by a new paradigm of knowledge production ('Mode 2'), which was socially distributed, application-oriented, trans-disciplinary, and subject to multiple accountabilities” (Nowotny et al., 2003, p. 179).

⁵⁵ These schools were named ‘polytechnics’ in the UK context; e.g., ‘Newcastle Polytechnic’ before becoming ‘Northumbria University’ or ‘institute of technology’ in other countries; e.g., ‘Carnegie Institute of Technology’ in the USA before becoming ‘Carnegie Mellon University’.

These led to the restructuring of the universities in the UK and Australia in the early-1990s, transforming previously vocational and educational schools into universities that can grant postgraduate degrees and conduct independent research (Melles, 2008a; Melles, 2011; Clerke, 2012). These changes in the broader context of academia brought along a need for these new disciplines to create academic identities for research despite their lack of tradition and experience in research (Henkel, 2000). As one of those new disciplines, design became an autonomous discipline rather than being subsumed by arts or engineering. This meant that each of these schools needed to forge a knowledge domain from their existing design practices, hitherto creating the disparities within design research⁵⁶. Due to their closer alignment to the rational approach to design, the engineering schools were somewhat able to resume the 'methodological' progress made by the early design research. On the other hand, creative art & design schools fell short of staff with research qualifications and experience (Bazeley, 1994). The new research focus also created a challenge for the industry practitioners who were recruited to teach the vocational aspects of these practices at these schools (Rosch & Reich, 1996). Most importantly, there were not many examples to transforming vocational or artistic practices into a knowledge domain. Practice-based research was an emerging phenomenon with no existing framework for grounding research in the wide range of creative art & design practices⁵⁷. As a result, Frayling's proposal was embraced to compensate for the lack of a research framework in art & design that included practice as the main location of knowledge.

The adoption of Frayling's quasi-framework as a model for research in art & design created challenges, as well as opportunities. Firstly, it was not as easily transferrable as the Ulm model was for structuring industrial design education for example (section 2.1.3). The relationship between an expanded notion of

⁵⁶ I will be discussing this as 'research recognition gap' in Chapter 8.

⁵⁷ Similar forms of research led by the practice and a kind of problem-solving approach also exist in the social scientific disciplines, often referred to as 'action research'. In fact, these emerged long before the practice-based research in arts & design; however, they are not particularly relevant to this thesis.

research and a wider range of creative practices was clearly more complex than educating industrial designers to cater to the specific needs of the industry. Furthermore, Frayling's proposal was a work in progress, far from finalised. As Frayling had explained later, it was adapted from his predecessor Sir Herbert Read's idea for "teaching through art and teaching to art", and it was quite open to interpretation from an operational perspective that led to "serious conceptual problems" (Friedman, 2008, p. 155). As a result, its adoption facilitated divergent configurations to creative research. This methodological pluralism would be perceived problematic from a traditional perspective to research, whereas it'd be perceived as an opportunity to be encouraged as 'methodological innovation' from a creative perspective to research (e.g., Yee, 2010; Yee & Bremner, 2011; Borgdorff, 2012).

However, where there was a lack of research tradition and/or narrow understanding of design to begin with, conceptual problems surfaced in the ways design research was practiced. For example, research and practice were confused as identical categories rather than "different categories of creative endeavour" that co-exist (Durling, 2002, p. 81). Similarly, Feast & Melles criticised the "attempt to elevate the designed artifact to the status of research and accentuate the practice-based nature of design as the distinguishing characteristic of the discipline" (2010, p. 4).

I need to emphasise here that practice-based design research diverged from not only the traditional understandings of research, but also from the conventional design practices as such. For example, practice-based design research often entailed going back to design's origins to bring back the arts and crafts approaches to design beyond the approaches to design as problem-solving. Furthermore, design's relationality would often bring in different preconceptions and expectations from its potential configurations with research, depending on the context. Therefore, explaining and justifying the creative practice-based design research to outsiders has been more difficult than its conformist counterparts. Altogether, practice-based design research has been more difficult to explain and justify than the theoretical studies into design, such as design history or design studies. That's where the privileged

status of Frayling's quasi-framework would come in handy as a means of justifying research through art and design practices alongside the theoretical studies into and for design.

2.3.2 Methodology and the hegemony of the 'sciences'

Methodology is described as the study of 'the system of methods and principles used in a particular discipline' (New Collins Concise Dictionary, 1986). Problems begin as soon as a discipline departs from an objective understanding of "reality as a concrete structure" to a subjective one as "reality as a projection of human imagination" (Morgan & Smircich, 1980, p. 492). While the underlying idea of systematic unity could lead to the convergence of methodologies in the first, the latter's acknowledgment of the subjective nature of reality transforms the study of the world into a more complex, messy process. For the latter, the researcher is no more an instrumental responder to the reality, but an active contributor to it, which creates further challenges for the study of these multiple realities. Indeed, there's a greater degree of methodological divergence within the latter in comparison to their convergence into the 'scientific method' within the first. 'Scientific method' refers to a set of general principles to acquire knowledge through empirical methods. By accelerating the development of scientific inquiry since the Enlightenment, 'scientific method' has contributed a lot to the structuring of academic institutions and the 'research prestige' of mainstream scientific research, especially what is known and prioritised as the 'STEM' subjects that focuses explicitly on scientific concepts and discoveries.

Although 'scientific method' is only a way of conducting research, academia has been shaped and structured by the sciences⁵⁸. This has resulted in the idealisation of 'scientific method' when talking about research methodology,

⁵⁸ I have talked about how the sciences took on their contemporary meaning today as the natural sciences today, sometimes to include the social sciences depending on the context, in section 1.3.3, whereas initially the natural sciences were inseparable from their speculative counterparts as philosophy (Pasnau, 2017). Philosophy and the humanities were named 'speculative sciences' within the broader understanding of the sciences, but the separation happened from the Enlightenment onwards as philosophy of the sciences was made implicit into 'scientific method' as its methodology.

especially if it involves an empirical study of the world⁵⁹. I referred to the inclusion of new modes of knowledge production in academia as of the 1990s in the previous section. These new modes included more practice-led, socially responsible, artistic or applied research (Limoges et al., 1994; Nowotny et al., 2003), but let us consider how the social sciences were once considered a new mode of knowledge production in academia. The origin of sociology as a new, 'scientific' way of looking at society only dates back to the 19th century. A great deal of its acceptance as a legitimate science is due to its adoption of 'scientific method' in order to do so.

In social sciences today, there are two main methodological traditions, namely as positivism that employs the 'scientific method' to produce scientific facts and the post-positivist approaches⁶⁰ that are more open to the use of experimental methodology and qualitative methods (Lindlof & Taylor, 2017). As one may expect, the latter approaches may go as far as to question the means and ends of studying the social world that eventually developed into distinct approaches to social sciences, such as participatory action research. Hence, these approaches may become the locus of scientific legitimacy discussions unless they can argue for new criteria for their reliability and validity, as in the example of McTaggart (1998). For example, Denzin & Lincoln (2005) provided a timeline of the key moments to the development of qualitative research in North America, which demonstrate the different traditions in social research⁶¹. Therefore, qualitative research is

⁵⁹ I am excluding the humanities here, for they often employ primarily critical, speculative and historical methodologies that are significantly different than the mainly empirical study of the world in the sciences. I want to emphasise that this does not mean that the humanities do not make use of empirical evidence for inference and making arguments, this is indeed what scientism argues for. However, the difference lies in the sciences' focus on studying the world to generate facts and claims about it in contrast to the humanities' focus on interpreting it.

⁶⁰ Here, I have to note that postpositivism does not reject the 'scientific method' but aim to reform its basic assumptions such as the notion of objective truth and embracing the use of non-quantitative methods, as well as quantitative. This is quite important, for dichotomised positioning of quantitative and qualitative approaches is indeed simplistic and not something I'd argue for.

⁶¹ Bryman (2016) pointed out that Denzin & Lincoln's emphasis on this timeline has changed in their subsequent writings, even reduced to a mere footnote. Perhaps this was because they did not want their timeline to become defining and characterising for the historical developments to qualitative research. Bryman (2016) further said that some of their key

methodologically pluralistic, and sometimes against the grain of the 'scientific method'. Morgan & Smircich wrote:

“Once one relaxes the ontological assumption that the world is a concrete structure, and admits that human beings, far from merely responding to the social world, may actively contribute to its creation, the dominant methods become increasingly unsatisfactory, and indeed, inappropriate. For if one recognises that the social world constitutes some form of open-ended process, any method that closes the subject of study within the confines of a laboratory. Or merely contents itself with the production of narrow empirical snapshots of isolated phenomena at fixed points in time, does not do complete justice to the nature of the subject. The very nature of the phenomena under investigation challenges the utility of such methodological closure.” (Morgan & Smircich, 1980, p. 498).

Therefore, qualitative research methodologies are often misunderstood by outsiders who tend to perceive methodology as 'scientific method' and merely positivist approaches. For example, the constructionist argument against the idea of singular, objective reality, which forms the foundation for 'knowledge' is often perceived as just 'made up' (Braun & Clarke, 2013). Similarly, methodological pluralism in qualitative research may be even mistaken to involve an attitude of 'anything goes' in a complete rejection of the 'scientific method' (Russell, 1983), leading to a kind of uncritical pluralism or at worse, anti-science.

Such understanding disregards that these methodological frameworks have been developed by generations of qualitative researchers and intentionally left open-ended for a range of reasons. Firstly, as in all research, the nature of the research problem determines the criteria for the choice of research methodology; however, the problem rather unfolds for qualitative research and can be captured “only through means of static techniques and only in the most partial and limited of ways” (Morgan & Smircich, 1980, p. 498). This means that methodology needs to be treated as an open-ended, flexible process

moments were rather too 'particular' and looked 'strange' in comparison to the rest, especially the last one being concerned with “a rift in social research in general rather than within qualitative research as such” (Bryman, 2016, p. 376). I guess I have similar concerns for this research, in which I identify some key moments for design research relevant to my narrative. However, given that I am not an historian nor adopt a systematic approach to this timeline, I would suggest treating it with caution as Bryman advised.

rather than a prescriptive one. In fact, it should be perceived as a 'reflective practice' to use Schön's (1987) terms, for qualitative research ultimately depends on the researcher's subjectivity, constant reflexivity and further on their competence for putting these research methodologies in practice. No longer external observers but active contributors to the construction of the reality, the qualitative researchers indeed employ research techniques that are appropriate for the task rather than strictly adhering to a set of standardised principles and procedures. Yet, the "precise nature" of the techniques and approaches developed over time "ultimately depends on the stance of the researcher, and how the researcher chooses to use them." (Morgan & Smircich, 1980, p. 498). For example, Geertz noted for ethnography:

"From one point of view, that of the textbook, doing ethnography is establishing rapport, selecting informants, transcribing texts, taking genealogies, mapping fields, keeping a diary, and so on. But it is not these things, techniques, and received procedures that define the enterprise. What defines it is the kind of intellectual effort it is." (Geertz, 1973, p. 6).

The departure from understanding methodology as a template into an approach has transformed some forms of qualitative research⁶² into a more complex and even intimidating endeavour for newcomers. This was especially the case for methodological bricolage as "an organising metaphor for how to do qualitative methods, which involves the combining of analytic moves for the purpose of solving a problem or problems tailored to one's own research project", which implied a 'metamethodological' consideration for research (Pratt et al., 2022). Emphasising the practice aspect of research more than other methodologies, the bricolage approach ultimately depended on the researchers' competence and access to implicit knowledge through support networks or working closely with mentors who have mastered these approaches. This created a need for 'methodological templates' that refer to "standardised ways of conducting research that are used as formulas for

⁶² Once again, I'd like to emphasise that not all qualitative research shifted its focus as such, but rather those embracing a subjective understanding of reality have diverged into specific approaches. I don't want to make an oversimplified distinction of qualitative and quantitative approaches, for qualitative approaches can be used within a positivistic framework or quantitative approaches can be used within an interpretivist framework.

shaping the methods themselves” in order to offer guidance for newcomers and those may not have the support networks as such (Pratt et al., 2022, p. 212).

On the other hand, despite their original intention to mitigate the challenges arising from the implicit knowledge involved in these approaches, templates were found to encourage uncritical or ‘formulaic’ applications for a number of reasons and diminish the quality of research (Eisenhardt et al., 2016). Pratt et al. (2022) explained the reasons as follows: Firstly, a lack of acknowledgment for the incompleteness of these templates, especially if they are well-specified for the sake of being helpful. Secondly, the assumption that a strict adherence to the template would yield good outcomes, including potential publications. Finally, a template does not guarantee a deep understanding of the metamethodological considerations, that is, why these choices were made. Pratt et al. also acknowledge that “it is neither possible nor illuminating to describe all of the myriad thoughts, tangents, and blind alleys that go into and ultimately result in the insights presented in the article, a template can give the impression that the research can be conducted without these other, often essential, parts of the research process”, resulting in further confusion around why success in publication is not guaranteed when following a template (2022, p. 214).

To put simply, the bricolage approach to research transforms research into a situated and reflective practice rather than merely putting a transferrable methodology into action to yield outcomes. Within this approach, critical thinking cannot be an option throughout the research process, but becomes the very practice of research itself. As with any practice, research becomes what the practitioner makes of it in practice from the designing and conducting of the research to its dissemination. Rather than being a research methodology, bricolage metaphor for research emphasises the agency, creativity, and craft of the researcher as bricoleur (Klag & Langley, 2013; Pratt et al., 2022).

Most disciplines are organised upon a convergence — of their approach to research, object of study, shared concerns. Although divergences may occur as the nature of research problems necessitate, the scientific method is a locus of methodological convergence for scientific disciplines that make these concerns and choices implicit in its standardised protocols to ensure legitimacy. In fact, scientific method outsources this task to epistemology. It has been even argued that the philosophical domain of epistemology is made subservient to the sciences for justification (Pasnau, 2017)⁶³. Hence, it's no surprise that research in the (natural) sciences rarely encompass a methodology chapter that goes into detail about the very specifics of what can be known or the history of the methodology they employ (see Chapter 4). By outsourcing the task of justification to the domain of epistemology and imposing norms around how to conduct research that are made almost entirely implicit in practice, scientific method *naturalises* the legitimacy of scientific research. While *compliance* with the method eliminates the need to justify why and how knowledge is generated through the set of methods used in the research, the nature of the research problem in the sciences further justifies why that particular research was *needed*.⁶⁴

On the other hand, bricolage approach is a locus of divergence and pluralism, regardless of the 'scientific' status of the research it serves. For example, a social scientific researcher may adopt a bricolage approach, just as a design-led researcher may adopt a positivistic approach that is aligned closer to the scientific method than the bricolage approach. So, the difference between the

⁶³ Professor of philosophy Robert Pasnau stated that “no part of philosophy is as disconnected from its history as is epistemology” (Pasnau, 2017, preface). He talked about the originally broader meaning of 'sciences' to include the wider and more speculative range of topics within epistemology before the Enlightenment, which has come to be understood in much narrower terms due to the take-off of 'scientific method'.

⁶⁴ Today, sociology of science paints a more realistic picture of how science works than the caricaturised view of the sciences as 'puzzle-solving'. This more nuanced understanding of the sciences help us see the creativity, intelligence and imagination involved in the sciences: "To raise new questions, new possibilities, to regard old problems from a new angle, requires creative imagination and marks real advance in science" (Einstein & Infeld, 1938, p. 92). Moreover, when I say 'compliance with the method', I do not imply that scientists uncritically implement the method step by step, but rather emphasise the protocols they need to follow in order to ensure reliability of their data and the validity of the facts they generate.

two methodological approaches is less about the science/non-science distinction, but rather about the encouragement/discouragement of a compliance with the 'method'⁶⁵. Therefore, a departure brings further challenges for legitimisation, mainly concerning the criteria for ensuring trustworthiness of the research. On that note, Pratt et al. emphasised the metamethodological choices involved in the bricolage approach over an adherence to the 'templates':

“Moreover, the bricolage metaphor provides a way of thinking about how to make methodological choices more transparent. We detail in the following three central elements of bricolage: making do, utilizing the resources at hand, and combining resources for new purposes (Baker & Nelson, 2005). These elements help create an “effective arrangement” (Duymedjian & RÜling, 2010, p. 141), contributing to the trustworthiness of the research.” (2022, p. 217).

Despite its emphasis on research as practice, bricolage is not a practice-based approach to research as in practice-based research in art & design. Its origins in the social sciences can mean different priorities in the evaluation of research, thus, it is often presented along with a reference to Frayling's (1993) 'research through art & design' in order to distinguish the adoption of bricolage within a practice-based approach to research in art & design. This further emphasises and indeed values the indeterminacy (not-knowing) involved in design research as opposed to the predictive power of scientific research (Yee & Bremner, 2011). Therefore, there's an extra layer to the metamethodological considerations facilitated by the bricolage approach in practice-based design research, which demand a justification for making use of design practice for research despite its associated risk in order to ensure credibility. In this sense, design is closer to the humanities, or what was once considered to be 'speculative sciences', for it prioritises speculation and critical thinking in its valuation of indeterminacy rather than a desire to 'know'.

⁶⁵ This should not be understood as a lack of deviations from the scientific method. Indeed, deviations can lead to new discoveries, or what Thomas Kuhn (1970) called 'paradigm shift'. However, under normal circumstances, deviation from the scientific method is not encouraged and needs to be minimised. This contrasts with how templates are discouraged within the methodological bricolage approach.

However, it has been the sciences that have substantially shaped the cultural policies and institutional practices within academia since the Enlightenment. Until the last century, methodology has been predominantly perceived in the traditionally scientific sense. These modes of academic knowledge production remained unchallenged until the inclusion of these new modes of knowledge production in academia, including the practice-based research in art & design. Yet, the inclusion of new modes of knowledge production in the knowledge economy did not necessarily help its accommodation in academia. Instead, the hegemony of the sciences were made implicit (Lewandowska & Kulczycki, 2021), surfacing only at particular instances and discourses. For example, the references made to Frayling's 'research through art & design' to distinguish a practice-based 'bricolage' approach from its social scientific counterparts in the lack of an overarching research framework in art and design led to its perception as a quasi-methodology for practice-based design research and further misappropriations as I will elaborate in the following chapter.

Chapter 3 – Literature Review II:

HCI Research

Introducing this chapter

Is HCI scientific? Why was the Golden Age of HCI short-lived? What do HCI's disciplinarity mean for technological research?

Technology is continuously evolving, integrating into our lives and even bodies in ways that were previously not possible due to the developments in computing technology. HCI as a research field indeed emerged as a specialised domain of computing research to tackle the increasing complexity of technological design. Looking back into its origin as a multidisciplinary research field, where the traditional division of labour in academic knowledge production is maintained, we can begin to understand the issues brought by its expansion and ongoing transformation into a more interdisciplinary one.

In this chapter, I will be exploring how HCI research has historically responded to the technological and social changes, as well as to the emerging approaches to studying the social and designing technology. More specifically, I will look into how politics of design research came into play in interaction design research in HCI. I will situate the emergence of 'Cultural Probes' as a designerly critique of method in HCI. In doing so, I will be able to unpack some of the disciplinary tensions made implicit in HCI research throughout its expansion. My goal is to underline the limitations of disciplinary approaches to studying complex real-world problems like technology.

Key Concepts

- Disciplinarity
- Multidisciplinarity
- Interdisciplinarity
- Scientific method
- Basic/applied science
- Theory-method relationship
- Scientism
- Theory-practice gap
- User-centred design
- HCI's waves, paradigms
- Ethnography
- Ethnomethodology
- Interaction design
- HCI's turn to [x]
- Critical technical practice
- Cultural text
- Design implications
- Takeaways
- Cultural Probes
- Royal/minor science
- Recuperation

Chapter 3 – Literature Review II:

HCI Research

In this chapter, I will elaborate on the origins of HCI research that started out as the multidisciplinary and applied counterpart of computing research that aimed to employ scientific method to address technological design problems. I will cover the main debates around how the field has become increasingly self-aware of the complexities to technological design, limitations of ‘scientific method’ in approaching what’s essentially design research, and its disciplinarity. I’ll draw parallels between the beginnings of design research and HCI design research to argue against rational approaches to design. I will expand on design’s inclusion in the field, or rather how designerly approaches to research made strategic use of the field’s ongoing expansion and resulting fragmented knowledge production.

3.1 HCI: Origins & issues

My generation was born into the times when computers were still confined to the workplaces in the late 1980s, yet we welcomed computers into our homes before we were teens due to the rise in personal computing technology. For many of my generation and the following generations in the privileged parts of the world, computers have always been a part of our homes and leisure, though not always ubiquitous. It sometimes feels odd to think of the past times when we actually needed to turn on the internet and turn it off after we were done, regardless of our purpose of use — whether it was to play an online game, chat to a friend, ‘surf’ as part of our leisure activities, or for work-related purposes. Our interactions with the computer were limited to our actual use time and specific needs of our use purpose, so were our expectations of the computers. Therefore, the computing-related design challenges of the time was different than today’s increasingly complex ones that require an understanding of the multiple dimensions of being human. The shift “from work-related tasks to lived experience” of computing technology is indeed reflected in the naming of emerging domains: from Human-computer

Interaction (HCI) and Computer-Supported Cooperative Work (CSCW) towards Interaction Design and User Experience Design (McCarthy & Wright, 2004). In this era of “new computing” (Shneiderman, 2002, p. 2), usability could no longer remain limited to the capabilities of the computer⁶⁶, but had to expand onto those of the ‘user’. So, one would expect a more humanistic HCI⁶⁷, but institutions resist change, even where its people may be more open to change. Therefore, there’s value in revisiting the origins of HCI as an institution. In this chapter, I’m going to explore how interaction design research in HCI has developed over time. I’ll demonstrate how this development happened mostly in isolation from the heterogeneous academisation of design I’ve discussed in the previous chapter (see Chapter 2). In doing so, I’ll argue how this aggravated the already fragmented nature of design-led knowledge production across different HCI communities.

First of all, HCI as a research field emerged as a domain of computing research concerning itself with technological design. It was born out of the emerging needs of computing technology that became apparent in Engelbart’s interactive demo⁶⁸ for the first time in the 1960s. Hence, it was established to be the ‘applied’ counterpart of computer science, seeking to make computational systems more useful through practical applications of theories and methods of the cognitive sciences (Carroll, 2003; Rogers, 2012). As a result, psychology was amongst the first disciplines to be included in the initial configuration of HCI as a multidisciplinary science to serve the goal of understanding how people make use of computational systems (McCarthy & Wright, 2004). This new science had less to manage despite the complexity of the task at hand: There wasn’t much methodological incommensurability to the disciplinary ways of working, as both computer science and psychology (i.e.,

⁶⁶ Shackel (1990) characterises those as effective, flexible, learnable, and satisfying to use.

⁶⁷ I am not referring to Bardzell & Bardzell’s use of ‘humanistic HCI’, which they described as “any HCI research or practice that deploys humanistic epistemologies (e.g., theories and conceptual systems) and methodologies (e.g., critical analysis of designs, processes, and implementations; historical genealogies; conceptual analysis; emancipatory criticism) in service of HCI processes, theories, methods, agenda-setting, and practices” (2015, p. 3)

⁶⁸ Engelbart’s demo was retroactively named “The Mother of All Demos” because of its historical importance that led to a series of milestones in computing research for technological design.

the dominant approaches at the time) preferred to stay in the ‘science lab’ and shared a disdain for the ‘irrationality of embodiment’ as surfaced in the analogies made between the computer and human brain (Lupton, 1995). There was less ambiguity to the potential use scenarios as all human actions were thought to be rational and purposeful. There was less complexity to the modes of human-computer interaction, for these could only happen through the prescribed means and procedures of manipulating data⁶⁹. As a result of this “deliberate simplification of action”, the field could make ‘scientific’ progress in a straightforward manner until the 1980s, both in the academic and business contexts (McCarthy & Wright, 2004, p. 6). The underlying scientific ideals to the simplicity of the early HCI research and its engineering design models remained unchallenged until the late 1980s, when the field started to diversify in terms of its disciplinarity⁷⁰.

The field of HCI expanded to bring in a range of sociological and anthropological approaches in order to study the notion of user and their actions. As the conception of user shifted from “a cog in a virtual machine” to “a social actor” (McCarthy & Wright, 2004, pp. 6-7), actions began to be situated in context⁷¹. This led to a series of new formations and approaches within HCI’s expansion, such as the founding of the ‘Special Interest Group on Computer-Human Interaction’ (SIGCHI)⁷² and the start of the CHI conference series in 1982 and Computer-Supported Cooperative Work (CSCW)⁷³ in 1984

⁶⁹ For example, the acronym WIMP was used to characterise the overly-limiting features of interface as Windows, Icons, Menus and Pointer until replaced by the graphical user interface (GUI) that is continued to be used today (Jacob, 1996; Rogers, 2012).

⁷⁰ It should not come as surprising that many of the well-known figures in HCI have a background in psychology along with computer science-related fields. These include Allen Newell, John M. Carroll and Stuart Card amongst the founding figures, as well as the more design-specialised ones. For example, Don Norman, who has been an advocate for user-centred design in HCI, has a background in engineering and psychology. Amongst many PhD students supervised by Norman are Jonathan Grudin, whose work frequently touched upon disciplinary knowledge production in HCI, and Bill Gaver.

⁷¹ This is due to the influence of Lucy Suchman’s book titled “Plans and Situated Actions”, which presented the outcomes of a case study indeed. Suchman argued that human actions cannot be abstracted “away from its circumstances” (1987, p. 50) as the mainstream cognitive science approaches had been studying human behavior in HCI until that point.

⁷² It was originally named the ‘Special Interest Group on Social and Behavioral Computing’ (SIGSOC), but was renamed into SIGCHI with a change in focus. For more information, see Borman (1996).

⁷³ See Greif (2019) for more information.

as more specialised domains amongst many more. However, it also marked the start of disciplinary tensions within HCI (i.e., often referred to as the 'big hole'), and the incrementally diminishing relevance to the industry practices (i.e., often referred to as the 'theory-practice gap'). These meant that the 'Golden Age' of HCI was simply over, because there was no more a consensus on "what it was about, what it strove for and what it could achieve" (Carroll, 2003; Rogers, 2012, p. 4). There was increasingly less agreement on the questions asked by HCI research and how research should be conducted to answer those (Rogers, 2012). There have been different reactions to this problem. While some 'turned' to a range of different approaches to research, some looked at it from historical perspective as a natural outcome of a field's development.

Historical perspectives contextualised the changing perceptions and understandings within HCI as part of its trajectory as a developing research field. These changes were retroactively named as 'waves' (Bødker, 2006) and 'paradigms' (Harrison et al., 2007). Despite the emphasis on their uneven distribution within HCI, these references were problematic for the 'shifts' weren't as profound as in Kuhn's (1970) 'paradigm' nor were united and sweeping as in the 'waves'. Furthermore, in somewhat linking these changes to theoretical developments, they did not challenge the mainstream understanding of HCI as an autonomous science rather than a research field that had to respond to the technological and societal developments. However, they helped normalising these changes for the re-stabilisation and continuation of the research field. Therefore, the idea of different waves/paradigms have been embraced widely within the contemporary HCI discourse, especially to justify the inclusion of further research epistemologies and methodologies in HCI.

However, this idea has also normalised the fragmented nature of knowledge production in HCI by arguing that these different waves/paradigms can overlap and co-exist together. Rogers (2012) also acknowledged these serve different purposes in the field rather than replacing one another, in line with Grudin (2006) and Bannon (2011). Most likely, they have co-existed all along and

continuously developed in different directions for these bifurcations to occur. In fact, it is not an easy task to indicate the 'start' of a new wave/paradigm nor explain their enduring co-existence even today. As a result, Rogers (2012) suggested 'period' only in heuristic reference to epochs in the history of art as a more realistic framing to what actually happened. She identified a classical, modern and contemporary period of HCI that denote the distinct style and philosophy of each term⁷⁴ in order to link these developments to the broader context of technology and research rather than an insular view of the field. In doing so, she aimed to highlight that these changes were not a result of "a shift in intellectual thinking but more a recognition that technology and design problems were changing at that time" (Rogers, 2012, p. 19). She further wrote:

"The Classical HCI period imported cognitive theory in a rigorous and constrained way; the Modernist HCI period saw a broader and colorful palette of approaches and uses of theory — from social, phenomenological and cognitive science — while the Contemporary period became more value-led, drawing from a range of moralistic and societal-based perspectives." (Rogers, 2012, p. 7).

To sum up, HCI has moved on from rather simplified understandings (i.e., of itself as a field, of technology, people, interaction) to more nuanced ones since its beginnings. As a design-oriented field (Fallman, 2003), it could no longer remain as an autonomous field of science as it was initially configured. Design's relationality has made HCI increasingly responsive to the societal changes and technological developments, as well as the changes to the broader context of academia and disciplinary modes of knowledge production. This meant that HCI expanded to include even more disciplines and their pluralistic approaches to research. As a result, philosophy has become increasingly important in HCI as opposed to the simplicity of outsourcing it to epistemology through the adoption of scientific method (section 2.3.2).

⁷⁴ She wrote that this lens "lends itself to understanding the way different theories have come and gone, and the zeitgeist behind their development" (Rogers, 2012, p. 7). I think it works better in terms of distinguishing the changes to HCI, for it considers HCI research within the broader context of research and society. Furthermore, the disciplines of the expanding HCI were going through changes themselves both within and outside HCI, especially those concerned with qualitative research. For example, Morgan & Smircich's influential article "The Case for Qualitative Research" (1980) is a crystallisation of the changes in the social sciences.

However, it resulted in a kind of nostalgia for the multidisciplinary science HCI once was in its Golden Age and the simplicity that came with it. This specific kind of scientism⁷⁵ was latent for HCI's expansion remained limited to the scientific disciplines throughout the Modern Period of HCI. Nonetheless, the Contemporary Period is underlined by incommensurability within HCI research as non-scientific disciplines started entering the field, the discipline of design being one of those.

3.2 Design's inclusion in Contemporary HCI

Despite what I've just stated, the discipline of design wasn't included through a particular instance in HCI, nor did the entry into the Contemporary Period. It certainly was not a top-down decision to include the discipline of design for their designerly approaches to research. These designerly approaches were introduced to the field as the existing communities within HCI continued to develop in different directions. Despite their unsuitability for HCI research due to their 'non-scientific' status, these designerly (and further humanistic) approaches managed to find a place for themselves in-between the increasing divergence and the subsequent fragmentation within HCI research. In this section, I will first underline the fragmentation that had already begun in the Modern Period from a Mode-2 knowledge production perspective. In doing so, I'll demonstrate that non-scientific approaches could find a way into 'scientific' HCI research within the questioning of the authority of 'ethnographic' knowledge in a rather opportunistic manner. Then, I will situate the emergence of Cultural Probes within that context to discuss how its uptake indicated to the greater, underlying issues of a rapidly-expanding HCI, elaborating on Boehner et al.'s (2007) analysis.

3.2.1 The authority of 'ethnographic' knowledge

According to Rogers (2012), Contemporary HCI differs from the Modernist one in its socially conscious and increasingly interpretive and cultural perspectives

⁷⁵ Indeed longing for a simplicity that never existed for science, apart from HCI never being a science. In this sense, HCI has been scientistic by default.

to HCI research making use of critical theory as of the mid to late 2000s. This was indeed facilitated by the inclusion of “ethnomethodologically informed ethnography”⁷⁶ towards the end of the Modern Period in the 1990s (Rogers, 2012, p. 48). Ethnomethodology, in its rejection of top-down theories into the social, questioned the authority of the ‘ethnographic’ knowledge as part of the broader questioning of the authority of knowledge in academia, namely, the transition into the mode-2 knowledge production (section 2.3). The argument here was that ethnographic studies were no longer useful for HCI: Due to their research stance, ethnomethodologists would only provide rich descriptions rather than prescriptive takeaways for the mostly industry-based design side of HCI (Cooper, 1991). This brought a pressure to justify ethnomethodological approaches that was sometimes mitigated by new dissemination practices. For example, Anderson et al.’s (1993) detailed and descriptive ethnomethodological account of an organisation’s working practice was followed by a “four brief ‘bullet-point’ guidelines” as Rogers described it (2012, p. 49). However, these ‘takeaways’ were found to be not only belittling for designers, but ethnomethodological insights were particularly ill-suited for ‘design implications’ (Rogers, 1997; Dourish, 2006; Rogers, 2012). Despite the following attempts to create a new dialogue between HCI designers and ethnomethodologists, such as that of Button & Dourish (1996), the HCI discourse on ethnography soon became antagonising rather than constructive⁷⁷. Rogers noted: “The debate over what is acceptable HCI practice has long passed and more constructive debate about what contributions different kinds of ethnography have to offer is to be welcomed” (2012, p. 50). As a result, the antagonising aspects of HCI’s underlying scientism was also made implicit as the field continued to expand and include a wider ranges of research approaches into the field by taking different turns.

⁷⁶ Rogers described ethnomethodology as an alternative ‘methodology’ to sociological research with an ‘anti-theoretical stance’ (2012, p. 48). As such, it is more of an approach than a methodology that aligned with the ‘situated action’ approach in HCI that started in the 1980s.

⁷⁷ For example, Crabtree et al.’s (2009) paper titled “Ethnography considered harmful” made a harsh criticism of the cultural ethnography practices in HCI for their emphasis on ‘rhetoric’, turning publications into “social and cultural texts” rather than outcomes of empirical research. They wrote that the critical interpretative frame is “not a matter of rhetoric, literary practice, critical reflection, or cultural interpretation, but one of uncovering ‘social facts’” (Crabtree et al., 2009, p. 885).

Therefore, as inclusive as it may seem, Contemporary HCI is indeed marked by the making implicit of its problems around disciplinary knowledge production. As the field continues to expand, so does the big hole that can be quite challenging for ‘newcomers’ arriving at HCI research from a wide range of disciplinary backgrounds. Due to the underlying scientism to HCI’s disciplinarity and understanding of design, HCI’s big hole creates an especially hostile environment for design researchers of ‘other’ design backgrounds that are more oriented towards arts & humanities.

3.2.2 Turn to design

Rogers (2012) identified the major turns⁷⁸ within the Contemporary HCI as follows: the turn to design (e.g., the coining of ‘interaction design’, the use of artifacts for research rather than mere ends), the turn to culture (e.g., cultural studies, humanities, and critical theory), the turn the wild (i.e., studying people in their own contexts outside ‘the lab’), the turn to embodiment (e.g., ‘embodied interaction’), and the turn to practice (e.g., ‘Action Research’, practice-led research in art and design), amongst many more⁷⁹. These were a result of HCI’s increasing self-consciousness around the authority of scientific knowledge and its scientific status as a research field. At the same time, these turns were responding to societal and technological developments due to design’s relational nature, such as the turns to sustainability, emotion, and even global development. Yet, design was still a turn to take for the ‘scientific’ HCI despite the increasing awareness of its status as a ‘design’ field, as pointed out by Fallman (2003) and the adoption of ‘interaction design’ to describe HCI research. Therefore, what Rogers meant by the turn to design is still different than the practice-based research in art & design and design research as I’ve understood it, as also indicated by her separate categorisation of design and practice as two of the major turns. So, HCI’s turn to design was about rethinking the use of artifacts in research to generate knowledge rather

⁷⁸ Rogers (2012) noted that “a turn” has become popular to denote a change in framing especially with the “turn to the social” as coined in the 1990s. It was then used to describe “the turn to practice in HCI” (Kuutti & Bannon, 2014), “turn to the wild” (Crabtree et al., 2013), “turn to the arts” (Jacobs et al., 2015) for example.

⁷⁹ Fuchsberger et al. (2021) added more to this list in an ACM interactions magazine article.

than thinking of design as the end goal of research within an understanding of design as 'instrumentalised problem-solving' (Pierce et al., 2015). This turn was facilitated by researchers whose research and networks remained closely knit with HCI during their re-location into 'design schools' within the heterogeneous academisation of design⁸⁰. This resulted in new institutional configurations for these design researchers, based mostly on how their institutions understood and envisioned design in relation to research. As a result, a connection between design and HCI design discourses was established. For example, Bill Gaver described his research journey as being "a good student of HCI until I found design" (Gaver, 2022, personal communication). The turns to design and practice were also induced by the criticisms towards rationalist approaches to technology by Winograd & Flores (1986), Coyne (1995), Agre (1997), which made the growing epistemological differences within HCI more apparent.

On the other hand, McCarthy & Wright (2004) focused on the turn from rationalism to (design) practice rather than design and practice separately. They argued that the turn to practice "involves developing a sensibility to a plurality of perspectives on sociocultural practices" (McCarthy & Wright, 2004, p. 24). Agre's "critical technical practice" did that by bringing in to the HCI discourse the notion of "critical reflection", "bringing unconscious aspects of experience to conscious awareness, thereby making them available for conscious choice" as described by Sengers et al. (2005, p. 50). However, McCarthy & Wright (2004) stated that rationalism was made implicit in this turn, as practice does not indicate an underlying philosophy. Therefore, rationalism was made implicit in the turn to "formal approaches to design" and their attempt to "capture and represent design expertise, making the process objective and explicit" (McCarthy & Wright, 2004, p. 25). Indeed, striving for scientific ideals even where not suitable was scientism in its essence.

⁸⁰ For example, HCI design researcher Erik Stolterman was located at the "Institute of Information Processing" under the department of computing science at Umeå University in Sweden, indicated by his bio in a 1994 paper, prior to joining the "Institute of Design". Similarly, Bill Gaver was relocated to the 'Computer-related Design' department at the Royal College of Art in the late 1990s from working at Apple as a research scientist.

3.2.3 The emergence of Cultural Probes as ‘designerly’ critique of method in HCI

I’ve previously talked about how artistic design approaches were marginalised from the ‘design school’ to find a place for itself in the art schools (section 2.1.6). There I’ve also mentioned how this brought the ‘art school ethos’ into design, maintaining a Romantic vision of design, as also argued by Fallman (2003), and further rejecting the conservative roles attributed to design. This was apparent in the way Gaver, Dunne & Pacenti (1999) developed, made use of, and introduced their particular approach to research as ‘Cultural Probes’. Indeed, these researchers from the Royal College of Art were explicit that they came “from the traditions of artist-designers rather than the more typical science- and engineering-based approaches” into HCI (Gaver et al., 1999, p. 24). As such, ‘Cultural Probes’ was a reaction to, a critique of the prevailing rational understandings of design in HCI. They emphasised this subversion in the way they created and used Probes to gather ‘inspirational’ data in playful and experimental ways rather than in the formal manners of research data collection, as well as how they ‘analysed’ the data, and further in the way they disseminated the outcomes of their research (Gaver et al., 1999). This was a critique of the user research in HCI at the time, which was limited to the strict empiricism of ‘user-centred design’ approaches, maintaining a cognitive scientific attitude to design (section 1.1). Understanding design’s concern for what could be rather than science’s concern for studying the world as it is (Simon, 1996), Cultural Probes were “designed to disrupt expectations about user research and allow new possibilities to emerge” (Gaver, 2001). Furthermore, it was a ‘designerly’ critique of rationalism made implicit in the turn to design for its ‘method’ that “assumes a privileged relationship between these representations of knowledge and thinking” (McCarthy & Wright, 2004, p. 25). Gaver et al. (1999) chose to leave these details out in their dissemination in order to avoid a scientific uptake of Probes as a method.

In many ways, ‘Cultural Probes’ and their designerly critique of method combined most of the major turns as identified by Rogers (2012) as culture,

wild, design, embodiment, and practice. In emphasising subjective interpretation over scientific objectivity, it embodied HCI's turn to culture. Their desire to make the researcher visible and give participants a voice in the process was a symptom of the turn to embodiment. Their desire to be experimental and artistic designers rather than user-centred designers was a critique of the 'scientific' user research at the time. Their intentional ambiguity in dissemination was a critique of the formal approaches to design, namely 'design methods'. Finally, taking the user research to the 'wild', they provided a critique of the formality of user research methods in the science lab as detached from the reality of technology.

3.2.4 The uptake of Probes in HCI

In their review of Probes, Boehner et al. pointed out to the problematic nature of knowledge production in HCI: "a deeper and disturbing trend in the amalgamation of research methods into an interdisciplinary context: a disengagement between methods and their underlying methodology" (2007, p. 1084). However, the relative accessibility of design in comparison to others within the disciplinary silos of knowledge production in HCI surfaced the pre-existing bias around design and its 'research prestige' in academia. This was reflected in how HCI interpreted the Probes by "codifying a design approach into easily-reproducible methods, or research recipes" (Boehner et al., 2007, p. 1084). In other words, the 'simplification' of Probes enabled 'easy progress' (Law, 1999, pp. 9-10) for a quick turnaround in interdisciplinary knowledge production as a kind of "discount ethnography" (Dourish, 2006). The problem was not with the Cultural Probes, but rather their fitness to HCI's underlying ideals: Their efficiency in generating "broad and rapid data" (Paulos & Jenkins, 2005, p. 342) could easily conform to the "hurried empiricism" of interdisciplinary knowledge production (Lyotard, 1984, p. no).

Wallace et al.'s (2013) call for reclaiming design Probes in HCI was a result of this de-legitimation. Ghassan & Blythe's (2016) subsequent characterisation of 'design research' as a 'minor science' argued that design research was only allowed to exist within the suppressive frameworks of 'royal science' that was

HCI. Based on concepts and ideas from Deleuze & Guattari (2004), Ghassan & Blythe (2016) explained how the 'royal science' of HCI positioned 'minor science' of design research in a way that it operated in opposition yet still submissive to its own models and frameworks. They exemplified how HCI reinforces its domination through its 'reinvention' of Probes as a 'method' by co-opting of the initial subversion of 'Cultural Probes': "For design-based researchers, this process robs probes of their legitimacy. However, the opposite is true for their model-based [royal science] counterparts – for it is only by making probes submit to their model that it can become a truly legitimate tool" (Ghassan & Blythe, 2016, p. 73). Ironically, this kind of cultural appropriation of radical ideas to be absorbed into the dominant discourse was coined as 'recuperation' by 'The Situationists' that inspired the 'Cultural Probes'. In the light of royal/minor science conception of HCI and design research by Ghassan & Blythe (2016), the formalisation of Probes would mean transforming them into "a form that organises matter" (Deleuze & Guattari, 2004, p. 407) and reduce future divergence across the interpretations of 'Cultural Probes' for the sake of legitimacy. As a result, the subsequent 'homogenisation' of Probes would not only regulate the notion of 'Probes', but further govern design in HCI (section 7).

On the other hand, the interplay between the 'royal science' of HCI and 'minor science' of design research meant that both are in a constant state of flux and subject to change. Indeed, the understandings and attitudes to research within the field of HCI have changed since its early beginnings. It enabled a shift from more rigid guidelines, formal methods and scientific attitudes to research that considered people only as 'human factors' to 'human actors', then started questioning the field's fundamental values attributed to technology, such as efficiency (Bødker, 2015). Albeit the uneven distribution of these changing understandings across HCI, these changes play an important part in how design has been included in the field, defining and re-defining the flux of design through its relations.

Chapter 4 – Methodology

This thesis is qualitative research into design research. It does not deal with how design can explore a specific question, as is typical for a Research-through-Design ‘methodology’. It is not practice-based research, but it deals with theories around design practices and the creation of practice-based research, which comes from a practice-informed theoretical perspective. The thesis became a more theoretically driven enquiry, grounded in qualitative research, due to a series of events; including the disciplinary and personal anxieties throughout the journey of becoming a design researcher (section 1.6), but also in order to mitigate Covid-19 impact on the initial practice-based research plans. This practice-informed perspective has been compelled by the identified the gaps within design research, which I outline as follows:

1. historical and political factors behind the inclusion of design in academia that have been overlooked in the framing of design as a mode of knowledge production,
2. the crucial aspects of decision-making throughout the design-led research process that are often made implicit in the dissemination, which can be especially observed in the dissemination of design-led research in HCI,
3. that *thing* about design practice (and also artistic practice as its close kin) that is claimed to be impossible to capture through theory, often referred to as the *tacit* knowledge.

In this chapter, I will first elaborate on the epistemological outlook of my research in section 4.1 in two key aspects of ‘qualitative’ and ‘design research’. I will elaborate on the research design as a case study of Probes in HCI in section 4.2.

4.1 Philosophical approach

4.1.1 Thinking ‘qualitatively’

Qualitative research is a grey-zone⁸¹ for ‘science wars’⁸². It is a limbo land, stretching from extreme positivism’s mechanical conception of the world as a machine to the conception of the world as an open, organismic system calls for different modes of knowledge production (Morgan & Smircich, 1980), where it may potentially reach an extremely relativistic view of reality in which post-truth and anti-science flourishes⁸³. Denzin & Lincoln argued that these paradigm wars created “a space for abstracted empiricism”, which was then filled by evidence-based research where technological rationality prevailed without a consideration for the politics of evidence and research (2013, p. 3). It resurfaced scientism in its endorsement of a narrow view of science (Lather, 2004; Maxwell, 2004; Denzin & Lincoln, 2013) and its “dogmatic adherence to an exclusive reliance on quantitative methods” (Howe, 2004, p. 42).

Therefore, qualitative research was made into a ‘soft scholarship’ against the ‘hard science’ (Carey, 1989, p. 99), for “qualitative evidence often conveys a strong sense of change and flux” (Bryman, 2016, p. 395). It was deemed unscientific, exploratory and subjective for its concern for the lived experience that cannot be easily dissected into facts and opinions in its entanglement with the individual beliefs and culture. It simply didn’t stand a chance against the “nostalgia for a simple and ordered universe of science that never was”

⁸¹ Used interchangeably with grey zone, gray zone, and gray-zone, grey-zone is simply a space in-between peace and war in international relations. Hughes noted that the characteristics of grey zone “cross the conceptual boundaries between tactical action and grand strategy” (2020, p. 134). He further explained these characteristics as involving time, proximity, deliberate ambiguity, the use of proxies or disguised actors, and ‘muddying the waters’ with false narratives in order to obfuscate the conditions on the ground (ibid.).

⁸² To put simply, ‘science wars’ refers to the discussions around the legitimacy and authority of science over society that turned into a war due to a series of misunderstandings that highlighted the increasing disconnect between different methodological camps and disciplinary silos in academia, the dangers of scientism, as well as problems in research dissemination and the use of jargon.

⁸³ This is often attributed to postmodernism and its incredulity towards any notion of ‘objective reality’. Emerging within literary criticism, it is a rejection of modernism and its epistemic certainty. A key idea of postmodernism is that ideology is made implicit into the universalist claims to knowledge as a means of maintaining political power. Postmodern ideas have influenced qualitative research in how ethnographic accounts are framed and even presented (Bryman, 2016).

(Popkewitz, 2004, p. 62). Moreover, the deep colonial roots of the term 'research', especially that of qualitative research, needs new ways of thinking qualitatively. As a result, "searching for a new middle", qualitative research moves in several different directions at the same time (Denzin & Lincoln, 2013, p. 1). Contemporary approaches increasingly turn to the humanities for critical and interpretive frameworks, transforming the qualitative researcher into a bricoleur, methodology into a pragmatic, strategic, and self-reflexive practice, and research into an emergent construction (Weinstein & Weinstein, 1991; Nelson et al., 1992; Denzin & Lincoln, 2013).

Qualitative research is a search for meaning and meaning resides in people rather than being 'out there'. Unless I am able to be people, I am not able to grasp the meaning residing in them. Moreover, these meanings are actively constructed in contexts. They are contingent upon the specific interactions between people and the world in each of these contexts. For example, how a Probe is understood amongst design researchers is indeed different to what they actually are. There may be different understandings even amongst the team of the originators of 'Cultural Probes'. Indeed, I believe there is, for Gaver and Dunne followed a different approach to framing them differently in their subsequent publications⁸⁴. The differentiation was indeed a result of how 'design research' was understood and how design practice was configured into the research practice.

Similarly, the design researchers who engage in 'design research' had different configurations and understandings of design. Each of these concepts (i.e., design, design research, Probes) took on their meaning throughout the research processes from its initial conception to dissemination. The meanings were under constant negotiation and subject to further negotiation as the researchers' understandings and practices of these concepts potentially changed. They were indeed re-negotiated and actively re-constructed within

⁸⁴ For example, while Dunne increasingly understood and practiced Probes as part of his specific critical design approach in collaboration with Fiona Raby (Dunne & Raby, 2001), Gaver diverged into a methodological understanding of Probes as 'Probology' (Gaver et al., 2004) and further as an 'inventive method' (Gaver et al., 2012).

the specific context of 'interviews' with design researcher knowing that their meanings and words were to be my research data. Needless to say, I am fascinated by the notion of demarcation and view qualitative research as a boundary-making practice in the ways it allows for the negotiation and active co-construction of multiple meanings.

As such, I am following a constructivist ontological position, which is often used interchangeably with constructionism. Constructionism is a non-foundational view of knowledge, in which there are *knowledges* rather than 'knowledge' (Braun & Clarke, 2013). The "social properties are outcomes of the interactions between individuals, rather than phenomena 'out there' and separate from those involved in its construction" (Bryman, 2016, p. 375). Therefore, constructionism assumes an interpretivist epistemological position, in which an understanding of the reality can only happen through its interpretation. As a result, there are "frequent references made to empathy and seeing through others' eyes" (Bryman, 2016, p. 393). This means that the researcher is no longer positioned as a detached 'outsider' to their 'object' of study for the sake of scientific neutrality. In fact, both sides are 'humanised' and become subjects of the research.

Furthermore, an engagement with the 'researched' is encouraged, for an 'insider' position allows for a deeper understanding "beneath surface appearances" (Bryman, 2016, p. 394). This entails an inherently critical stance to research, because constructionism views knowledges as social artefacts and aims to explore the taken-for-granted social, cultural, moral, ideological and political aspects of knowledge (Braun & Clarke, 2013). This is particularly the case for the concept of 'Cultural Probes', which became a metaphor for designerly critique of method in HCI (section 3.2.3), taking on its meanings only through its divergent interpretations as Boehner et al. (2007) argued. In doing so, the narratives around Probes negotiate design's provisional disciplinary boundaries in HCI, determining the insider/outsider position, as Wallace et al. (2013) implied (section 1.2).

Finally, the metaphor of 'stitching' is often used in order to describe the work of qualitative researcher as bricoleur. In reference to Eisenstein's cinematic technique of 'montage', bricolage creates new meanings by putting pieces together (Denzin & Lincoln, 2013). This emphasises the agency, creativity, and craft of the researcher as bricoleur, as stated in section 2.3.2. Furthermore, it transforms the narrative of the research from the beginning till the end in terms of how it is framed: Research does not concern itself with filling an existing gap out there anymore, but its contribution rather emerges as connections are made between the pieces.

On the other hand, even for research in art & design, the prevailing advice is often to start with a 'contextual review' in order to find a "tangible gap in knowledge" (Gray & Mallins, 2004, p. 36). It is indeed a remnant of the 'excavation' metaphor for disciplinary knowledge production from the positivist empiricist sciences to dig the 'truth' (Braun & Clarke, 2013, p. 35). On that note, the reliability of 'contextual review' has been discussed in terms of its knowledge contribution for the understanding of 'context' remained limited in a practice-based design research and the 'review' was 'loosely structured' as opposed to providing a full "state of knowledge in the field in the period preceding the study" (Durling, 2002, p. 82). Therefore, the conventional terms and approaches to research can operate differently in design research. Taking on the advice of using methodology to "discipline your passion, not to deaden it" (Rose, 2001, p. 4), I will explain how thinking 'designerly' further benefitted this research in the following section.

4.1.2 Thinking 'designerly'

It is said that qualitative research is an interdisciplinary, transdisciplinary, and sometimes counter-disciplinary field (Nelson et al., 1992, p. 4). Underlying these configurations of disciplinarity is an idea of boundaries and the desire to overcome them. Yet, the sense of disciplinarity in design is rather 'porous' and 'stratified'; it is not only distributed across different disciplines and research fields, but there are different layers to it due to its heterogeneous academisation (i.e., the differences to design education, design research,

practice-based design research on a macro-scale, as well as the more nuanced engineering/art approaches that developed into their own sub-domain on a smaller scale). This is less of an issue for becoming a design researcher when pursuing practice-based design research and/or using design as a means for contextual inquiry (e.g., configurations based on [x] design to understand [y] etc.). Potentially coming from a specific approach to design research and working with the supervisor in a master-apprentice relationship, the theoretical framework for the research does not need inquiry into *all* approaches, but rather one of many. On the other hand, if the research is about design research itself, for example to understand what design research is and its ways of studying the world, finding an entry point for design research is rather tricky (see Chapter 8). The multiple forms and meanings of the word design indeed complicates it further. It became especially clear to me when conducting a desktop search for the theoretical parts of a PhD, such as literature review chapters for ‘design research’ and further for ‘Probes’.

First of all, getting to ‘design research’ is not as easy: A simple search for ‘design research’ and its variations (e.g., research by design, research through design, practice-based design research, design-led research, design-based research) yields a wide range of results that need meticulous sorting. For example, I came across the use of ‘design-based research’ for educational inquiry (Scott et al., 2020). While it seemed familiar at first, I did not recognise any of the cited sources for ‘design-based research’ derived from the fields of engineering or applied physics. Indeed, I soon found out about ‘design-based research’ as coined by Ann Brown (1992). It was an emerging paradigm for educational inquiry and learning sciences (The Design-Based Research Collective, 2003; Barab & Squire, 2004; Wang & Hannafin, 2005; Anderson & Shattuck, 2012) with thousands of citations for each of these key texts, yet no references to any of the key design texts as I have known.

A desktop search for Probes was also tricky for the same reasons. Being aware of the different namings of Probes, I did not limit my search to ‘Design Probes’ or ‘Cultural Probes’. When searching for the keywords ‘design’ and ‘Probes’ separately, it yields many results referring to the design of probes

from a wide range of fields, such as chemistry and medical imaging. Similarly, library database search was tricky because potentially related resources were distributed across a wide range of journals and databases rather than being in one. ACM's digital library turned out to be one of the most organised databases for design, though limited to interaction design. As a result, I often ended up adopting a different strategy than what is advised in the researcher training sessions offered to the postgraduate students across the different faculties within the university⁸⁵. Some of the key strategies that were suggested in these sessions, such as targeted database or keyword searching, yielded convoluted results for my research, indicating to a 'research recognition gap' (Chapter 8.1).

Secondly, even within 'design research', there are challenges to identifying design research as I've understood and practiced it. This is partly because of the increasing complexity and porosity to previously identifiable design domains⁸⁶, but also due to the stratification within design research. For example, a straightforward search on 'design research' tends to yield results dominated by the field of 'engineering design' rather than 'industrial design' for example. Even within industrial design research, the results are likely to be dominated by the sub-field of 'industrial design engineering' rather than industrial design as I've understood and practiced it. While methodological approaches to design have lost popularity within the art & design communities, especially after the inclusion of practice-based design research and artistic research in academia, the remnants of the 'design methods' movements can be observed in the methodological approaches to engineering design research, sometimes quite explicitly, as in the examples of Horváth (2004), Blessing & Chakrabarti (2009), Cash (2018), Cash (2020). These often read

⁸⁵ While postgraduate researcher training sessions for 'preparing a literature review', 'effective searching', 'research philosophies and paradigms' or 'research impact' was offered across the faculties by the university library, sessions like 'doing focus groups', 'ethnography and visual methods' were offered by the department of social sciences, catered to the specific postgraduate research needs of the faculties. In my case, I was part of the faculty of arts, design and social sciences.

⁸⁶ I am referring to the blurring of design domains that were previously conceptualised and practiced as separate domains (e.g., the blurring of the boundaries between product and interaction design) and the instrumentalisation of a design domain within another (e.g., the use of graphic design practices within user experience (UX) design).

well and are easier to access than the practice-based design research. As one moves toward the 'artistic' end of design research, archival practices are messier. They are not only distributed in a wider range of journals and databases, but also require more determination to access the outcomes via checking portfolio websites, project reports, exhibition catalogues, blogs and videos beyond the scholarly databases. As a result, they are left out of the hierarchy of evidence in research⁸⁷ if they were to be used as a reference. While they count as primary sources in historical research and humanities research, they in general qualify as 'soft data'⁸⁸. Therefore, even where a researcher may be determined to find, access and make use of these non-conventional outputs of practice-based design research, these sources do not qualify as 'proper' research references and further result in 'softening' the research in which they are referenced.

The different disciplinary approaches to design research brought up a third challenge around defining 'designerly' research as opposed to design research. Becoming a design researcher in HCI resulted in a peculiar kind of 'undisciplined researcher' (Rodgers & Bremner, 2013), for design's layered disciplinarity has enabled different levels of engagement with 'design research' in HCI. First of all, HCI's design orientation (Fallman, 2003) does not necessarily concern itself with contributing to the overarching disciplinarity of design. Thus, most design research in HCI does not aim to contribute to the

⁸⁷ The hierarchy of evidence is a framework that ranks the relative strength of results obtained from scientific research, in which the meta-analyses and systematic reviews are considered to be the strongest for they are more 'filtered' and case reports, expert opinion, editorials and background information are the weakest due to presenting 'unfiltered' information. Here, the filtering denotes to ways of assessing the certainty of evidence through sample size, the use of controlled and randomised controlled trials and, of course, peer review. There may be differences to how the hierarchy is structured and what it includes, although the gist of it remains the same since its first introduction by Guyatt et al. (1995). It becomes relevant to design research for its common use in evidence-based practices, e.g., evidence-based policymaking (Spaa et al., 2019). In fact, a PhD by publication in design makes this hierarchy more visible by specifying requirements within a ranking of publication venues for design research. While it may change according to the institutional requirements, 'Design Issues' journal is often amongst the top, followed by CHI and DIS conference publications, and finally DRS conference publications.

⁸⁸ Looking at the other uses of 'soft', one can see the diminutive connotation in soft. For example, 'soft sciences' lack the methodological rigor, exactitude, and objectivity their 'hard' counterparts have. Similarly, the valuation of 'hard skills' in the job market in comparison to 'soft skills' contribute to this understanding of 'soft'.

overall research practices in art & design. This is because the interaction design research in HCI emerged as a specialised domain of computing research rather than as a design domain as previously explained in section 1.1 and Chapter 3.

Anyone engaging with the design research practices in HCI would become a design researcher as a matter of course, regardless of their disciplinary background, approach to and engagement with design research. A straightforward way to identify the 'designerly' in order to identify the tensions within design research in HCI would have been checking design researcher's backgrounds and identifying those that come from a 'disciplinary' design background like myself. However, this would have significantly limited the diversity of the perspectives to design research. It would have reduced people into mere products of their education and stuck to a narrow idea of disciplinarity. For example, Rosner (2018) exemplified through the intellectual journeys of Lucy Suchman and Donna Haraway how "design seeds a different brand of interdisciplinary study, one that requires a theory of knowledge production and a recognition of institutional history" towards creating alternative paths for design scholarship. As a result, I indeed checked into design researchers' backgrounds, not to discriminate on the basis of their backgrounds, but to contextualise their work in the light of their intellectual journeys.

A good indicator of the 'designerly' has been the adoption of Research through Design as an approach to research in HCI. However, being wary of HCI's appropriation of RtD, I steered clear of methodological shortcut uses of RtD or its formulaic applications. These were too 'pragmatic' with little or no consideration for the origin of the term and the surrounding methodological discussions. Based on this, I further observed different citational practices around RtD in HCI: Design researchers that were more aligned with art & design approaches to design research in HCI were more likely to refer to the original source as Frayling (1993) rather than citing the other key texts on RtD in HCI. Reading between the lines and reflecting on my own experiences and observations on how to determine and identify the 'designerly', I have

recognised that it was not a matter of disciplinary background or the use of design-led approaches to research.

The hallmark of a 'designerly' approach was deeply rooted in the natural inclination to interdisciplinarity and criticality. For example, the first was often manifested in the 'bricolage' approach to design research, whereas the second was likely to be disclosed in the way it is put to use. In HCI, the 'designerly' surfaced in the openness to other ways of knowing and knowledge production and the kind of humility in adopting these 'borrowed' approaches. Moreover, because of my background in different schools of thought in design (i.e., mainly the Bauhaus-Ulm model to industrial design and Scandinavian participatory design to interaction design), I was aware that 'RtD' would be less likely to be adopted as an approach by a participatory design practitioner due to its terminological connotations and historical baggage.

In order to include these other, yet equally critical and interdisciplinary approaches to design research, I expanded my search onto research adopting the approaches of 'co-design' and 'participatory design' in order to identify the 'designerly' researchers in HCI. I maintained a critical eye in assessing their approach in regard to their terminological references in the same way I did for RtD and eliminated the overly pragmatic uses. As a result, the 'designerly' was populated by design researchers of a qualitative approach to research with a background in art & design, humanities and social sciences.

As I was navigating the discourse on Probes, I have become aware of the two camps around Probes in HCI, often referred to as the different ends of "a probe spectrum" (DiSalvo & Khanipour Roshan, 2014): Gaver et al.'s Cultural Probes (1999) and Hutchinson et al.'s Technology Probes (2003). Technology Probes have been as popular as Cultural Probes in HCI and both are widely adapted to derive new types of Probes. Inspired by the Cultural Probes as an approach, a Technology Probe was defined as "a particular type of probe that combine the *social science goal* of collecting information about the use and the users of the technology in a real-world setting, the *engineering goal* of field-testing the technology, and the *design goal* of inspiring users and designers to think

of new kinds of technology to support their needs and desires” (Hutchinson et al., 2003, p. 18, emphasis mine). Therefore, it is a more specified approach to testing and data collection in-situ through the not-fully-finished provocative artifacts⁸⁹, which explains why Technology Probe applications are methodologically more coherent as a group than the both methodologically and conceptually ambiguous Cultural Probes applications. On the other hand, there has been a greater divergence to the interpretations of Cultural Probes, therefore a greater degree of methodological and conceptual ambiguity than the different applications of Technology Probes.

Similarly, I noticed how Probes as a concept have been diffractively⁹⁰ read across the ‘designerly’ research communities across HCI as opposed to their uptake as a ‘method’ for ‘discount ethnography’ as Boehner et al. (2007) reported. Although these critical and creative interpretations differed significantly from Gaver et al.’s (1999) ‘Cultural Probes’ in terms of materiality and how they were used, they shared a ‘critique of method’ in HCI with the original concept. This signalled an understanding of Probes as a ‘designerly’ method with a different evaluation and validation criteria than a traditional understanding of method. For example, Keinonen’s conceptualisation of design method⁹¹ as a competence not only considered how designers “leverage their insight, personality, and passion” in interpreting and applying Probes; but further argued against the standardisation and policing of Probes (2009, p. 286). According to him, the “individual styles may even add value

⁸⁹ Although the developers of Technology Probes distinguish them from prototypes by their functionality, flexibility, usability, logging and design phase (Hutchinson et al., 2003), their level of finishedness does not offer the adaptability, flexibility, creativity and contextuality in the development stage of more exploratory and participatory Probes as the Cultural Probe derivations, which is what I am interested in for the purposes of this research.

⁹⁰ In her PhD dissertation, Cally Gatehouse (2020) argued for a diffractive reading of design, research, and the unspecified, divergent configurations of design research as ‘design-research’ rather than reading ‘against’. Inspired by Karen Barad (2007), Gatehouse viewed diffractive reading as “a more productive way of marking the continuities and discontinuities” between different practices of design research, while embracing “the possibility of new ways for these practices to come together to articulate knowledge” (2020, p. 4). In this case, a diffractive reading of Probes in HCI views the divergence of Probing practices and interpretations as productive rather than conceptually problematic and convoluted.

⁹¹ I should remind here that Keinonen (2009) talked about ‘design method’ within a specific approach to user-centred design and his work needs to be thought as part of a larger body of work specifically on Probes.

rather than be seen as deviations from the proper application of a method” (Keinonen, 2009, p. 286).

However, these crucial and interesting aspects of Probes were often under-reported in the publications. Instead, the instrumentalised reporting on Probes would focus on their outcomes in HCI. This would in some ways ‘methodise’ Probes and even contradict with the underlying ‘critique of method’ inspired by the original concept. Due to my design background, I was able to estimate the ‘unspoken’ (Mareis, 2012) and the ‘tacit-ed’ (Tonkinwise, 2017) behind the references to the Probes. A taxonomical literature review like that of Matthews & Horst (2008) would have provided valuable insights, too, but it would have resulted in potentially inaccurate assumptions due to this dissemination gap between the actual practices and their reporting. In order to pursue the implicit aspects of the practices and narratives around Probes, I chose to conduct interview studies with ‘designerly’ researchers who have worked with and published on Probes.

I will talk about the specific aims and motivations for each study in the corresponding chapters (see Chapter 5 and 6), but I think it’s worth noting a few things here: Firstly, I was initially interested in understanding what a Probe is in order to use them for my contextual inquiry within a RtD approach as part of my original research plan. Despite Mattelmäki’s (2006) advice to get started with Probes⁹², I couldn’t. The HCI debate on the (mis)interpretation of Probes and the (il)legitimacy of RtD played an important part in this. I felt inhibited as a designer-turned-researcher for lacking a methodological foundation. The ambiguity around Probes, not only as a concept, but also methodologically⁹³,

⁹² Tuuli Mattelmäki’s PhD dissertation titled “Design Probes” (2006) begun as follows: “Instructions: ‘Apply!’” (p. 11). Keinonen (2009) also referred to that when discussing that there is no right or wrong way of applying the method as a competence.

⁹³ What Probes are not clear in the literature as a concept – a method, methodology, a technique, a supplementary method, or an approach. Based on that, I initially identified 3 different methodological takes on the concept of Probes in HCI as method, methodology, and meta-method. For example, the conventional uses of Cultural Probe packages, often referred to as “informational probes” (Mattelmäki, 2006; DiSalvo & Khanipour Roshan, 2014; Luusua, Ylipulli, Jurmu, Pihlajaniemi, Markkanen, Ojala, 2015), were examples to the uses of Probes as a method. The examples to the Probes methodology included the original

made the matters worse or perhaps I was eager to organise this messy matter. This was how the first interview study with individual design researchers was structured; as a conversation with those that have already experienced this ‘rite of passage’ of becoming a design researcher in HCI by publishing on their use of Probes (section 6.5.1.1). The semi-structured interviews were rather exploratory, partly because of my lack of experience in research interviews and partly because I needed to keep an open eye out for potential leads.

As I found out about the different reasons to why they chose to refer to the rather ‘problematic’ concept of Probes and made crucial aspects of the process implicit, I’ve become increasingly invested in the *realpolitik*⁹⁴ of Probes and design research. Therefore, the second study moved towards a discussion of the specific reasons behind particular decisions in the dissemination of design-led research in HCI. This shift was also necessitated by some practical challenges related to the specificity of design practices, as well as Covid-19 impact on this research, which I will explain in the following section. “Ways of studying and representing things can have world-making effects” (de la Bellacasa, 2011, p. 86). Thinking ‘designerly’ brought a natural consciousness to how the material and ideal world interact in-between for design is the very activity that concerns itself with these interactions.

4.2 Research design

4.2.1 Case study

There are many definitions and approaches to case study. Underlying all is a premise to determine a ‘case’ to study intensively. A case can range from an individual to a community, from a location to an institution, from a single event to a set of related events surrounding an issue (Bryman, 2016). However, it

approach, later referred to as ‘Probology’ (Gaver et al., 2004), based on Boehner et al.’s emphasis on the “divorce between method and methodology” (2007, p. 1084). Finally, I categorised Mattelmäki & Battarbee’s ‘Empathy Probes’ (2002) as meta-method, for they were used to support an empathic and respectful dialogue between the participants and the researchers differently than the original conception of Probes.

⁹⁴ I use *realpolitik* here to describe enacting or engaging in politics based on practical objectives rather than on ideological commitments. It is sometimes referred to as pragmatism in politics.

needs to have boundaries or these boundaries need to be set for its ‘casing’ (Ragin, 1992, p. 217). As I have explained in section 1.2 and 4.1, I am heavily invested in making boundaries for this research⁹⁵: I am not only demarcating Probes as a concrete case, but in doing so, I am able to understand the abstract phenomenon of Research through Design. As such, it is an instrumental case study, where a case is used to gain insights into another issue (Stake, 1995). The ‘real-life’ context of HCI allows me to further demarcate design research as I’ve understood and practiced it from a specific disciplinary perspective from a wide range of understandings that have historically gathered under ‘design research’ and now ‘RtD’. I’ve demonstrated that the meanings and understandings of both design and research are in flux due to the relational nature of design (section 2.1) and the changing context of academia (section 2.3), which means the definitions and configurations of design research are meant to remain ambiguous. Despite the challenges this brings to studying design, in making boundaries around design from my own perspective and experiences, I am indeed able to understand the ‘porous’ disciplinarity of design.

Despite their popularity both within and outside academia for its wide range of applications⁹⁶, case study is rather “poorly understood” (Flyvbjerg, 2013, p. 171). Hence, it is said to exist in a “curious methodological limbo” (Gerring, 2004, p. 341). It does not dictate a methodology nor conform to the conventionally scientific expectations of formal generalisability, yet it can offer detailed, rich and varied insights that can lead to an innovative understanding on a topic (Flyvbjerg, 2013). It aligns with qualitative research’s emphasis on the process as “a sequence of individual and collective events, actions, and activities unfolding over time in context” (Pettigrew, 1997, p. 338). However, proximity to the ‘real-life’ situation and the researcher’s context-dependent experience is central to an understanding (Simons, 2009). In this case, sharing the experience of becoming a design researcher in HCI from a design

⁹⁵ I have to note that I am making provisional boundaries only to be able to pin down the research on a case, not to authoritatively decide on what is design research or not.

⁹⁶ For example, case studies are popular within business, marketing, and politics outside academic research.

background and interpreting Probes has been important to how I understood and tackled this topic. Furthermore, the first-hand experience of going through the DIS and CHI submission processes enabled a deeper understanding of the context and process beyond what my study participants have shared with me (section 1.7). Hence, this research combines theory (i.e., what's already known and said), history (i.e., an interpretation of how things came to be for context as opposed to formal historiography), and the perceived 'reality' (i.e., the empirical studies into lived experiences of the design researchers, as well as my own observations and experiences) in order to reach a high conceptual validity and a deep understanding of the study topic. Despite the generalisability concerns in the traditionally scientific sense, it has been argued that if case study is combined with the intensive theoretical analysis of the 'case' can indeed generate theory out of the findings, namely "analytic generalizations" (rather than "statistical generalizations" (Yin, 2018, p. 21) or "theoretical generalization" (Mitchell, 1983) within an inductive tradition. Indeed, the concrete (context-dependent) case knowledge has been equally important for scientific innovations throughout history, for it allows for an exploration of contested viewpoints and helps explain how and why questions around the topic of inquiry. On that note, Flyvbjerg noted:

"That knowledge cannot be formally generalised does not mean that it cannot enter into the collective process of knowledge accumulation in a given field or in a society. Knowledge may be transferable even where it is not formally generalizable. A purely descriptive, phenomenological case study without any attempt to generalise can certainly be of value in this process and has often helped cut a path toward scientific innovation." (Flyvbjerg, 2013, p. 177).

Finally, case study approach is suitable for this study for its purpose as my PhD research. My emphasis on becoming a design researcher throughout this thesis is motivated by the specific conditions and circumstances in which this research was conducted: I did this research to primarily figure out the kind of design researcher I wanted to become in my future endeavours within the conditions of being a PhD student. I used it as an opportunity to refer back to

my previous experiences, sometimes to contextualise⁹⁷, sometimes to unlearn⁹⁸. I aimed to reflect the inherent story-telling potential in the case study approach as an “authenticated anecdote” (Simons, 2009, p. 4). The ‘story’ in a case study is not necessarily a chronological one nor is limited to the ‘method’; it is a coherent story made by organising the inferences and interpretations of events, metaphors etc in order for implications to be drawn from the case (House, 1980; Simons, 2009). It has a political dimension to engaging participants in the research process beyond the epistemological concern for the co-construction of perceived reality, because it aims to contribute to the participants’ self-knowledge (Simons, 2009). Therefore, case study has the potential to inform future decision-making, policy and practice (ibid.). To put simply, case study helps ‘make a case’ for a desired change. As a result, I made myself more transparent in the thesis narrative in order to acknowledge and emphasise the situated nature of the knowledge generated by this research, but I also ensured that I included rigorous explanations of how my values and actions shaped my approach to gathering and interpreting data for its validity.

4.2.2 ‘Casing’ & demarcating Probes

I have previously mentioned that Probes exist in some other research fields to denote different concepts than how they are understood in design and HCI contexts (section 1.1.4). This posed some practical challenges to demarcating the use of Probes within a design-led approach to research than these other research fields that may also concern themselves with the design of probes (e.g., the design of medical imaging probes). For example, a keyword search for Probing, Probe, or Probes (including [x] Probe, [x] Probes for Probe derivations are often named in this manner, as in the primary example of

⁹⁷ I’ve had many “Aha!” moments throughout the development of this thesis, but especially the parts about the academisation of design (see Chapter 2). These moments helped me contextualise why I was taught design the way I had been taught throughout my training at various institutions.

⁹⁸ For example, I’ve had tendencies to ‘organise’ design research within a rather rigid thinking fuelled by the disciplinary anxieties at the beginning of this research. Nuanced understandings of research, qualitative research, design research, and sharing concerns and experiences with much more experienced design researchers in particular have helped me mitigate this kind of thinking and its potentially antagonising effect.

'Technology Probes') along with keywords related to design research (including design, design research, research through design, codesign, co-design, participatory design) yielded results that were not relevant to the purposes of this research⁹⁹. Therefore, I aimed for tracing citations to key Probes publications for explicit references to Cultural Probes that introduced the concept of Probes to design and HCI literature. I've mentioned in section 1.2.4 that the key texts that introduced 'Cultural Probes' to the literature were the ACM interactions magazine article (Gaver et al. 1999) and CHI paper (Gaver & Dunne, 1999). However, there was a significant difference to the citation counts of these publications (2826 and 214 respectively as of January 2023), potentially due to the provocative nature of the ACM magazine article. Thus, I picked Gaver et al. (1999) to trace the citations. I observed that some other key publications that followed on the 'Cultural Probes' lineage were also often cited alongside this key text for 'legitimisation' and sometimes to indicate positioning to Probes. Indeed, Sara Ahmed argued that knowledge of a field is demonstrated by citing "those deemed to have shaped that field" (2019, p. 168). This was the case for the use of Probes as part of 'designerly' approaches to research in HCI, too. For example, Gaver et al. (2004) article on the value of uncertainty with Probes often accompanied the other to manage HCI's methodological expectations from the research making use of Probes, while Boehner et al. (2007) paper was cited for legitimacy concerns. Another popular text on Probes was Mattelmäki's (2006) PhD dissertation interpreting Probes from a human-centred design perspective. This text was commonly cited for positioning, but sometimes for its guidance and encouragement into Probing, which was valuable especially to newcomers and disciplinary outsiders. Finally, Wallace et al. (2013) paper was cited alongside to argue for 'designerly' interpretations of Probes. Here, I need to remind that each of these papers need to be historicised for when they were published and contextualised for the reasons to publication. The field of HCI

⁹⁹ While this keyword search looks for the words separately in a whole body of text to include results that may use design colloquially rather than indicating design research, surrounding the individual keywords with quotation marks to targets results that include these keywords as exact phrases. Hence, it initially seems to be more appropriate for this search; however it narrows down the scope of 'design research' to the use of specific and exact terms in spite of the convoluted terminological choices around design research.

has not been static but indeed the audience and the research agendas have changed since the introduction of 'Cultural Probes'. Moreover, the increasing number and divergence of Probe interpretations have also changed how the concept has been understood and accepted in the field. Hence, each of these papers have been 'time-sensitive', meaning they came from a particular standpoint and concern within a specific understanding of Probes *in time*. Perhaps because of that, along with the practical difficulties in searching for the use of Probes in design-led research mentioned above, or perhaps because the original ACM interactions article remains a repository for provocation and inspiration, the publications on Probes accumulate in reference to the original source and some other key texts as exemplified rather than building upon each other. Hence, the emphasis has been placed on the heterogeneous interpretations of Probes rather than developing them as an approach (Boehner et al., 2007; Wallace et al., 2013; Çerçi et al., 2021).

The accumulation of divergent Probe interpretations in reference to the 'Cultural Probes' creates a conceptual ambiguity that can be confusing or even inhibiting for a 'newcomer' to get started with Probes, because their value and history is made implicit in the citational practices around Probes in HCI. While this is known amongst the design communities within and outside HCI, for someone who may have heard of the concept somewhere, its 'designerly' value is not all clear. The conceptual ambiguity is furthered by the frequent uses of phrases like "inspired by Probes", "similar to Probes", "akin to Probes" that refer to 'Cultural Probes' without necessarily calling their artifacts as '[x] Probes' as in the Probe-derivations. Although these phrases aim to acknowledge the situated nature of Probing as opposed to a methodised one, they augment the conceptual ambiguity around Probes: Their historical value is made implicit in a lineage of citations from over a decade ago rather than explicit articulations.

While these may be implicitly known to the design and HCI communities, it creates an entry barrier for newcomers and potentially leading to misinterpretations, if not enhancing the conceptual ambiguity. In fact, this research became what it is due to this ambiguity for I was a newcomer myself.

Therefore, I aimed to leverage the boundary-making and meaning-negotiating features of qualitative research in conducting interview studies with design researchers rather than a literature review I had initially aimed for, similar to the taxonomical review of Probes (Matthews & Horst, 2008) and design across design communities (Atwood et al., 2002) or the citation analysis of Schön's legacy in DRS publications (Beck & Chiapello, 2018) and Bardzell's feminist HCI legacy in HCI publications (Chivukula & Gray, 2020).

By allowing design researchers to define and discuss their practices in relation to Probes right from the invitation to take part in my studies, I aimed to mitigate the practical challenges to demarcating Probes in the publications due to the conceptual ambiguity. I've explained earlier how thinking qualitatively and designerly facilitated making connections between the ongoing negotiation of design and the Probes since their introduction as a 'designerly' approach to HCI research. Thus, the 'casing' of Probes was to be further negotiated than imposed in the same manner¹⁰⁰.

¹⁰⁰ In their influential work titled "Sorting Things Out", Bowker and Starr (2000) talk about the ability of classification to shape relationships, form a community of practice, and signal membership within that community. Moreover, they add that classification involves an invisible work of sorting that tends to get black-boxed, as well as the politics of demarcation. They emphasise that classification is a network of negotiations rather than a top-down relationship and how thinking through boundary objects can make this invisible work of classification visible. In this case, by tracing the citation practices and references to the key Probe publications, I used the concept and publications of Probes as boundary objects to identify those that signalled their design researcher identity or the proximity to the design-led research practices, and later on brought together this 'community of practice'.

Chapter 5 – Study I:

What is a Probe anyway?

5.1 Introduction

This study aims to understand the implicit aspects of Probes and how and why design researchers use Probes. As I was navigating the discourse on Probes, I had become aware of some of the concerns around them, including the divergence to the Probe interpretations and intentions to use them, the design and planning process behind the Probe artifacts, and the overall lack of guidance for novice researchers wanting to work with them. While most of the publications reported on the instrumentalised use of Probes with a focus on their outcomes, very little attention has been paid to documenting and inquiring into the nature of these diverse practices. The literature was not clear whether they were adopted as a design-led method (i.e., Finnish user-centred design approach to Probes) or methodology (i.e., ‘Probology’). Moreover, I started to recognise through informal conversations with peers locally and at conferences more pluralistic understandings of the approach than often get reported. However, the literature only provided a partial understanding of the diversity of practices surrounding probes, and the lived experience of making and using Probes by designers.

5.2 Aims and motivations

Based on the above, I aimed to understand what a Probe is and the value of using designed artifacts in research from the divergent perspectives of design researchers. Therefore, the primary aim of this study was to understand the ways in which design researchers have used Probes in their projects, and to explore with them the motivations, rationales and techniques they use to create, deploy and sense-make around Probes in their research that may not be available in these publications. As a result, this study had the following key research questions:

1. What are the aims and motivations for design researchers in using Probes in projects? What was unique about their use of Probes than any other method?
2. How do design researchers use Probes in their research and practice – from their material production, to their distribution to the participants, and making sense of the insights?
3. How do design researchers generate knowledge and make use of Probes in a design process? Do they complement (or supplement) it with another qualitative inquiry method?
4. What is the relationship between a designer's identity, subjectivity and practice of using Probes?

5.3 Study Design

5.3.1 Method

The goal of this study was to explore the ways in which HCI design researchers understand Probes and their experiences of using them. Because of this emphasis on the “subjective understanding” (Seidman, 2006, p. 10) and the lived experiences of the participants (Roulston & Choi, 2018), I chose to conduct an interview study for their facilitation of a ‘professional conversation’ (Kvale, 2012) that would help me explore their experiences and perspectives around Probes in their own language (Rubin & Rubin, 2012). Semi-structured interviews also allow for a degree of flexibility in customizing the questions based on what the interviewees talk about, while ensuring a degree of uniformity in the points explored across the group of individual interviewees. In doing so, I aimed to develop with design researchers reflexive accounts and critical positioning of their own work that is often not reported in the publications.

5.3.2 Study Ethics

This study was approved by the Faculty Ethics Committee at Northumbria University upon submission of a Full Ethical Assessment Form. The study posed minimal risks to participants taking part in the study and they were fully

briefed in advance to the study with a Participant Information Sheet (Appendix A.1), giving them enough time to share their questions with me before agreeing to take part. They were anonymised and addressed pseudonymously throughout the thesis to provide a 'safe' space for them to openly talk about the under-reported issues that are acknowledged across the divergent design-led research communities in HCI. However, they understood that their identity may be traceable due to the personal nature of their design work and the recruitment approach I followed and signed a consent form (Appendix A.2) prior to beginning the interview. They were reminded before, during and after the interviews that they could pause or withdraw from the study at any time before a given deadline and that they could be de-anonymised and credited if they wish to do so. They were also debriefed.

5.3.3 Participant Recruitment

A close reading of the publications based on section 4.1.2 and narrowing down of the timeframe to within the last 5 years generated a list of 25 potential participants as the first or corresponding authors of these publications, who were at the postgraduate level or above¹⁰¹. I contacted these potential participants, explicitly stating that I wished to talk to them on their reported use of Probe-like artifacts to discuss their practices in relation to Probes (see Appendix A.3). In some cases, the participants recommended peers for us in a 'snowball sampling' manner. This process yielded the recruitment of 12 design researchers that have used Probes in a broad range of contexts and practices.

¹⁰¹ I actually eliminated a few publications that were about their use of Probes for projects at the Master's level, because I assumed a PhD-level research involves a higher degree of commitment and 'competence' in reference to Keinonen's (2009) paper highlighting the specific design researcher's capability, expertise, and knowledge to perform. He states: "Another way of conceptualizing a method is to consider it as something a specific agent is capable of performing. A method becomes actually such only with performance. The agent with its skills, intentions and the context where the method is applied are necessary prerequisites for understanding of the concept. This view focuses on the abilities of designers, or design researchers, to apply the method. This method is seen as a situated action utilizing and depending on the environment, its language, physical, technical and social surroundings. Depending on the designers' expertise, and on the knowledge available in the environment, a method can be completely or partly internalised skill of a person and tacit, or to a remarkable extent, but never completely explicit and transparent" (Keinonen, 2009, p, 285).

5.3.4 Data Collection

The interviews were conducted either in-person (P1, P2, P3, P5, P9, P10) or via Skype (P4, P6, P7, P8, P11, P12) with those that were not located within the region. The interviews lasted ranging from approximately an hour to 90 minutes. All interviews were audio-recorded and the virtual interviews were video-recorded for practical reasons; however, only the audio was used as data. I did not take any written notes during the interviews to maintain a conversational attitude with the participants. The open and exploratory structure of the interviews allowed for the emergence of different points of discussion around Probes and design-led research in HCI between the interviewer and participants, while adherence to the interview guide (Appendix A.4) ensured coverage for the same questions for all participants. They were first asked about their background as a design researcher, which helped break the ice, but also made explicit the plurality of design researcher identities within the increasing complexity around disciplinary boundaries. They were then asked how they defined Probes. In some cases, this led to interesting conversations about the semantics of the word (P6, P9), or the use of the term 'Probes' in different disciplinary contexts (P1). The conversation then got into more specific and reflective questions around their particular use of Probes on a project they wished to talk about. They were asked about the project context, their reasoning to use Probes for that project, what, how and why they made design decisions around Probes, how they introduced the Probes to their participants, and finally how they interpreted and used the Probe outcomes for their future work. Some participants suggested to additionally talk about another project than their identified project in reference to Probes (P6, P8, P9, P11, P12). This was often accompanied by some hesitation to whether they were also Probes, which furthered conceptual reflections on Probes. Throughout the interviews, participants supported the conversation with material examples and documentation of their Probes where necessary.

5.3.5 Data Analysis

For data analysis, I followed Braun & Clarke's (2013) suggestions for conducting thematic analysis in six main phases, which are as follows:

1. Getting familiar with the data: In order to fully immerse myself in the data, I listened to the recordings several times to transcribe most of them. I ensured the accuracy of the professionally transcribed ones (P5, P7, P8, P9, P10) by editing while simultaneously listening to the recordings and making analytic memos for emergent patterns and potential links between different transcripts (Saldaña, 2013). While most interviews followed the interview guide, investigating the same questions in similar order, the divergent nature of the Probing practices that were talked about in the interviews especially required identifying these patterns that were characterised by similarity, difference, frequency, sequence, correspondence, causation (Hatch, 2002). It provided the basis of the overview of participants in the following section 5.4. For the video recordings of the virtual interviews, I made notes of the project visuals shown where necessary. Finally, I edited all of the transcripts to ensure anonymity of the participants.
2. Coding: I printed out the transcripts and started coding the data using highlighters and pens. I coded based on what was being said on Probes firstly, and later on how it relates to the issues around design-led research. Coding was often done by sentence or a coherent group of sentences that explained a particular aspect as a whole. In the latter case, the group of sentences was broken down into fragments and assigned additional codes. For example, in the excerpt below, the interviewee explains their reasoning to name their research artifacts in reference to Probes, so it was assigned the first cycle codes of 'naming Probes' and 'Probes as method' and then the corresponding second cycle codes of 'citation practices', and 'ambiguity of Probes':

"we submitted the methodology paper at [Anon.] and there were, I can't remember all the reviews, it didn't get it, but part of the reviews were 'This is not a novel method, this is just a Probe'. ((laughs)) And like, the point of the paper was not really, I mean, partly it was to present the method, but it was also to present the analysis we had done of the method with a [Anon.] lens and so, so like, we spinned it, like we turned it around a little bit when we presented it back at-

we resubmitted to [Anon.] and then it got in, but when we wrote it for [Anon.], we kind of said like ‘Okay, this is like obviously inspired by Probes’.”

It also pointed out to the issues around peer review in HCI venues and how the ambiguity of Probes can reinforce their ‘methodisation’ in HCI, demonstrated in colloquial use of ‘method’. It further revealed the expectations around novelty for methodological contributions in HCI and that design researchers sometimes strategically adopted the language of Probes to focus on the outputs of their research artifacts. Such citation practices around Probes and dissemination narratives were imposed, creating a landscape that design researchers had to individually navigate as the word choices like ‘spinning’ and ‘turning it around’ imply. Hence, an additional code of ‘individual vs collective practices’ was assigned to the excerpt besides ‘peer review in HCI’, ‘HCI contributions: novelty’ and ‘dissemination strategies’ which concern design-led research than just Probes. As Saldaña (2013) pointed out, analytic memos from the previous step were very helpful in generating codes at that stage.

3. Identifying potential themes: The codes were then used to generate categories as an intermediary level between the ‘particular’ and ‘real’ codes and the ‘general’ and ‘abstract’ themes. Richards and Morse state that “categorizing is how we get up from the diversity of data to the shapes of the data, the sort of things represented” (2013, p. 173). Rossman and Rallis differentiates category from a theme as such: “think of a category as a word or phrase describing some segment of your data that is explicit, whereas a theme is a phrase or sentence describing more subtle and tacit processes” (2003, p. 282). Referring back to the excerpt above, codes like ‘Probes as method’, ‘citation practices’ and ‘individual vs collective practices’ were gathered under the category of ‘methodisation of Probes’. These codes were often linked to the HCI-related codes, such as ‘HCI methods’ and ‘HCI contributions’, putting them “in the context of the intentions and meanings that inform them” (Fossey et al., 2002, p. 730). I gathered

them under the theme of 'Things becoming Probes' in response to the study research question of why design researchers use Probes in their research and practice.

4. Reviewing potential themes: At this stage, Braun & Clarke (2013) emphasise that analytic narrative needs to start making an argument in relation to the research question of the study. The study research question of why design researchers use Probes in their research and practice was based on the assumption that Probes had to have an implicit value for design researchers that is not always communicated in their publications. As I was navigating the discourse around Probes at the earlier stages of this research, I often wondered why Probes maintained their popularity despite the ongoing debate around them and increasing degree of convolutedness around what they are. Because the study also asked investigated how design researchers made use of Probes in their research and practice in order to understand why they did so, there were many overlaps with the existing literature and their own publications I used to identify and recruit them as study participants. While these details helped contextualise their practices, they did not necessarily make it to the final analysis as themes for they were not so relevant for the overarching research questions of this thesis.

5. Defining themes: Braun & Clarke (2013) stated that reflexivity in thematic analysis acknowledges the researcher's particular social, cultural, historical, disciplinary, political and ideological positioning in the collection and analysis of the data. Taking this into account, I reformulated the themes as questions that reflect that my positioning and understanding of the theory-practice gap as a design researcher in HCI, looking towards theory from a practice perspective. Because the research draws connections between the discourses around Probes and RtD in HCI, I defined these themes with answers in regard to Probes. For example, the theme of 'Things becoming Probes' became:

‘How do things become Probes? Embracing the fuzziness of Probes for legitimising methodological ambiguity of design-led research in HCI’.

6. Writing up: During this phase, I re-evaluated some of the themes and added further codes to nuance the themes where I felt it was necessary. Glaser & Strauss (1967, p. 43) emphasise that these processes are not distinctly linear and embedded throughout, while Tesch argues that the demarcation process of data through the generation of codes, categories and themes happen within “fuzzy” boundaries (1990, pp. 135-138). I collaborated with my supervisors on the write up of this study analysis towards a paper submission for DIS 2020 Conference. Upon rejection, I re-worked the overall narrative of the paper with some iterations on the themes for the CHI 2021 paper submission (section 1.7). The version in this thesis (section 5.5) is a further re-working of the published analysis (Çerçi et al., 2021) due to my nuanced understanding of the topic, as well as the different constraints between a thesis and a conference paper submission, which include word count, audience and narrative.

5.3.6 Limitations

The recruitment strategy involved a negotiation of definitions and approaches around Probes with the potential participants. The explicit statement of the research interests in the invitations and the Participant Information Sheet (Appendix A.1) has led to a self-selecting group of 12 design researchers who were already willing to reflect critically about their own work and the discourse, holding on to the values of ambiguity, subversion, materiality and design as an alternate way of inquiring despite the diversity in their Probing contexts and practices. This could be considered a limitation of work if thinking about the study as a comprehensive review of the Probes literature through representative sampling. Here I must emphasise that this was not the goal of this study, but to make visible the critical dimensions and the intents of using Probes as research artifacts. In doing so, I aimed to explore with the participants new ways of practicing and disseminating Probes in a rather

speculative manner than what would have been a comprehensive literature review of Probes.

5.4 Overview of Study Participants

When approaching the potential participants, I addressed them as “design researchers” for their work had strong references to key design texts, if not taking place as part of design teams and/or published in design-related venues. This allowed me to keep a broader definition of design and space to negotiate the ‘design’ aspect of their design researcher identities, given the changing nature of design practice (Dykes et al., 2009). As a result, when asked to talk about their backgrounds as per the interview, some interviewees did not identify themselves as designers (P1, P4, P6), while some identified as multidisciplinary artist-design researchers (P5, P9, P12). However, they all aligned themselves broadly with Research through Design (Frayling, 1993) as a design-led approach to research.

Most of the participants were based in the European continent at the time of recruitment and the interviews, continuing their education or professional career within European organisations and institutions. While one participant came from non-European background (P1), they were still UK-based.

While many of these project contexts were cross-cultural, it was only highlighted in relation to their use of Probes by some participants (P1, P2, P5, P9, P12), and fewer took place outside European contexts (e.g., P1, P9, P12) while funded by European councils and institutions. The diversity of the contexts ranged from domestic practices (P2, P7, P8), humanitarian aid and international development (P1, P9), critical heritage (P5, P10), data practices (P4, P12) to digital jewellery (P3), urban interactions (P6) and pedagogy (P11). All of the projects the participants talked about took place either as part of PhD studies (P1, P3, P4, P8, P10, P11) or longer-term collaborative research projects involving multiple stakeholders as postdoctoral researchers (P2, P5, P6, P7, P9, P12).

Only 4 participants explicitly mentioned their participatory design approach to working with Probes (P1, P9, P10, P11), while they were all participatory in one way or another.

The ways in which participants first learned about and came into contact with Probes highly influenced their 'authorship' in Probes; that is, how they interpreted and practiced Probing in their own work, which will be explained further in the Findings. Those that had a design background were more likely to have worked with a Probe 'master' (P2, P3, P7, P8, P9), who is a more experienced design researcher who had used and published on Probes or similar Probe-like approaches extensively in their own work. Many of these participants had adopted many of the qualities and sensitivities of their master's own approach to Probes. On the other hand, those coming from other disciplinary backgrounds (P1, P4, P5, P6, P9, P12) mostly learned about Probes from published literature if not proximity to Probes through their networks, and were able to bring in their disciplinary strengths to their Probe interpretations. See Table 1 (on the next page) for an overview of why and how Probes were used in our interviewees' projects.

Table 1. List of Study I participants and their Probes

	Why did they use Probes?	How did they use Probes?
P1	To create mutual understanding within participatory, experience-centred design, sensitisation	Co-designed bespoke Probe materials to facilitate conversations and intervene in the situation on a daily basis
P2	For design ethnography within critical design, sensitisation	Designed bespoke technological artifacts to be deployed in the context after an initial engagement, conducted interview study around the Probe returns
P3	To explore materials and bodily interactions within craft-based design	Thinking through making the bespoke craft objects, which were then used as part of an enacted workshop performance to think together about these embodied interactions to inform digital jewellery
P4	To enact a fictional scenario within speculative design	Created Probes as props to engage participants in a fictional world during interview studies
P5	To elicit alternative perspectives within speculative design	Created task-based Probes to explore material affordances and alternative perspectives on the topic, sent them out to participants and discussed the returns in an interview study
P6	For playful, spontaneous data collection 'in-the-wild' within speculative design	Created a collaborative storytelling game with tasks to be completed by the participants. The tasks were fit into the narrative to collect geo-localised visual and audio data in a workshop; "pressure cooking on the kind of probe format"
P7	To disrupt conventional notions and co-ideation within critical design	Provided participants with a collection of half-finished concept sketches in advance for their completion, discussed the returns in a workshop
P8	As philosophical objects to disrupt conventional notions within speculative design	Made bespoke task packets for participants to be circulated amongst them. Didn't have an interview for returns
P9	To solicit opinions on highly precarious situations within participatory design	Co-designed kits with a community for them to probe themselves and left them behind
P10	To ask multi-sensory questions to solicit opinions within participatory design; sensitisation	Created packages with creative tasks; had interviews around the returns; used them throughout the design process as moodboards for immersion and synthesizing ideas
P11	To facilitate playful, reflective engagement around abstract notions within participatory design	Created an activity to facilitate conversations around another topic; had regular workshop sessions for this activity
P12	As material grounding to facilitate conversations within critical design	Created a task for participants to fulfill in advance to a performative workshop to facilitate conversations about the topic

5.5 Findings

The analysis led to the construction of the following themes around the critical intentions and concerns around Probes, relating them to the debates around design-led research in HCI in the form of questions and answers as explained in section 5.2.

- How do things become Probes? The methodological ambiguity of Probes as fuzzy, strange, yet legitimising design-led research (section 5.5.1)
- What is the implicit ‘research design’ in design-led research in HCI? Crafting the socio-materiality of Probes beyond the artifacts (section 5.5.2)
- Does HCI research care as much as the design researcher? Probes as subverting and facilitating small politics (section 5.5.3)

The findings presented below are organised around these themes.

5.5.1 How do things become Probes? The methodological ambiguity of Probes as fuzzy, strange, yet legitimising design-led research

Probes were seen as a “fuzzy” (P11) term lacking clarity and definition across all participants. When asked to share their definition of Probes in the interviews, often there were reservations about specifying or pinning it down too much. Acknowledging the situated nature of Probing practice and their individual divergences from the original Gaver et al. (1999) practice, the interviewees sometimes referred to their artifacts as “probe-like” or, as P7 suggested, “*inspired by Probes*”; but they were comfortable calling their artifacts Probes colloquially throughout the interviews. At other times, articulating their work as Probes was a pragmatic decision, exemplified by P9:

“In certain groups of people you may talk [of Probes] because it’s a shortcut, right? You know you kind of say ‘Oh it’s a cultural probe’ and everybody goes ‘Yeah, yeah, I know what you mean’ or you use it and people don’t know what you mean but they think ‘Oh that sounds quite interesting and we’d like to use it.’” – P9

It was clear that Cultural Probes had introduced a design-led way of using bespoke artifacts for research and have become a common point of reference with the audiences that may not necessarily be familiar with such from before.

For example, P4 stated that it helped positioning their design-led use of research artifacts in the HCI context: *“the viewers know what Probes are and there’s that sense of it and it’s useful to tie to that lineage”* (P4). In many cases the term Probe would come to be purposely used only later on in projects, and in some cases only when work became to be written up for publication upon peer-reviewers’ request. As P7 recalled, *“[we] never called it a probe in the whole project [...] but when we wrote it for [Anon.], we kind of said like ‘Okay, this is like obviously inspired by Probes’”* (P7). Furthermore, articulating their work as Probes was viewed to bring legitimacy to their approach which, in some context, may be viewed as lacking legitimacy. While this sense of legitimacy stemmed from the reputation of its originators in HCI, in contexts that are not familiar with HCI researchers, sometimes semantics did the job. For example, when addressing the funding institutions, the word ‘Probe’ could indeed compensate for the disciplinary anxieties potentially stemming from the historically lesser view of design-led research¹⁰² and even lesser view of more exploratory design-led research¹⁰³. P6 noted:

“Probe is the kind of perfect linguistic trade-off between sounding professional enough that you know what the heck you are doing [...] If I go to then say ‘Look, it’s a game. I make games. And these games are also Probes, data collection tools that I can use to actually understand what people are thinking’. This to my experience is the kind of boundary that I can push.” – P6

Although helpful for managing the disciplinary anxieties within the academic contexts in general, the connotations of the word ‘Probe’ was found to be contradicting the intention to use them for engaging people as research participants. To mitigate this tension, design researchers often had to

¹⁰² For example, as a form of practice-led research that is close kin to design-led research with many overlaps in terms of domain, methodological approaches and surrounding debates, artistic research has been excluded from the category of ‘research’ and kept at bay under the name of ‘experimental development’ in the Frascati Manual (OECD 2002) until the last decade (Borgdorff, 2012). This was the case for design-led research of artistic origin that took place outside the more scientific contexts of design.

¹⁰³ This is often observed in HCI, where different approaches to critical design-led research have been criticised for lacking ‘relevance’ for their positioning closer to ‘experimental development’ as practices of artistic origin in design. Forlizzi et al.’s (2017) proposal to distinguish and create separate evaluation mechanisms for their pragmatic design research from this kind of critical research is indeed to distance their approaches away from the historical baggage of artistic research.

introduce their artifacts with different terms in their actual context of use, such as “*creative kits*” (P9), “*creative packages*” (P10), “*mediation tools*” (P11), “*dialogical tools*” (P1), and “*object questions*” (P3). P9 explained the duality of design-led research in the reality of practice:

“I tend not to use that vocabulary with participants, it just sounds weird and the word probe is, is kind of quite medical [...] they don’t necessarily have the same design vocabulary [or] the same language vocabulary [...] so that kind of misinterpretation can lead to quite a lot of confusion [and] not have the desired effect in making people feel comfortable about being involved.”
– P9

It was clear that while few participants set out to explicitly create Probes, that the language of Probes was useful to adopt and appropriate in relation to articulating the more bespoke and situated work conducted on their projects. Very often, the creation of what would become Probes was not necessarily grounded in any clear objective, research question or aim. The open-ended iterative translation of ideas into materials and vice versa would eventually lead to the ‘practice’ of carefully making and materialising artifacts (Mattelmaki, 2008) that would then become Probes. Regardless of their backgrounds and previous experiences, all interviewees placed an emphasis on the ‘designerly’ aspect of Probes (Mattelmaki, 2005) and ‘thinking through making’ (Wilde & Marti, 2018) as such. This was further echoed by P11, who reflected how they started to see their work as “*thinking Probes*”, stressing “*an interaction between how you materialise something or how you think about it.*”. For those coming from design backgrounds and lacking formal training in research, Probes was particularly valuable for easing their way into research: “*making was a way to reassure myself and relying on skills that I’m comfortable with. [...] It’s a language that talks back to me.*” (P10). Several interviewees referred to how it “*amplified [their] tendencies as a designer*” (P7) and “*gives us [designers] materials that we’re comfortable to use.*” (P2). In this way, working with Probes were not only fun and rewarding as observed by Mattelmaki (2005), but also came naturally to them as an inherently design-led way of research. The creation of Probes themselves clarified, and helped to realise thoughts about the context under exploration as “*a knowledge base for further explorations*” (Mattelmaki, 2008, p. 75): “*I really see a lot of value of spending*

time and using Probes as a way of synthesizing [...] you create something that freezes your perspective or interpretation at that moment.” (P10).

The interviews allowed us to explore some of the reasons for the diversity of Probe interpretations. A key factor influencing these interpretations was design researchers' early contact with Probes and the ways in which they have become familiar with the approach and learned to apply it in their own work. For some of the interviewees – like P2, P3, P7, P8, P9 – they had worked directly with some of the originators or key authors of Probes. For these participants, it was possible to trace the ways a particular lineage of Probes had influenced how they then created and understood them in their own research practice. P2 mentioned 'authorship' in the interpretations: *“There's this little idea of the authorship through these different Probes”* (P2). For P3, who had a more craft-based approach to design-led research, the sense of authorship was even more heightened: *“I see myself being part of those Probes, like my subjective sort of [...] stamp is there [...] it's very bespoke, very personal to me again and to the other person”* (P3). In these cases, it was also clear that knowledge around the creation and manifestation of Probes came through trial and error and, to some extents, a master-apprentice form of learning. These interviewees, all from art and design backgrounds, had learned mostly through doing, observation of a peer in practice, and small group critique in a design school spirit. The practice-based learning reinforced, for them, specific understandings of what Probes are and should be.

Not all participants learned through such relationships, however, and became familiar with Probes from published examples, documentation, and such to develop knowledge and competencies for making Probes. For example, the interviewees that had come into design research from more scientific backgrounds (e.g., P1, P4) saw Probes as promoting dialogue with their research participants, to provoke reflection from them in new ways, and to gather more diverse forms of empirical data than 'traditional methods' would allow. The fuzziness and vagueness of Probes in contrast to the conventional understanding of “method as recipe” (Lee, 2012, p. 42) clearly enabled interviewees that came from other backgrounds to appropriate them in ways

that align with their prior expertise and experience outside of the field of design, while also pushing forward the methods of inquiry they may have been trained in. P6, for instance, was previously a semiotician and anthropologist, which influenced how they used Probes as a form of storytelling. For some interviewees of art and design backgrounds (e.g., P5, P10, P11, P12), although they did not learn about Probes in practice through a master-apprentice manner, they were fully comfortable with the fuzziness of Probes for they had the implicit knowledge of situated design practices. While they often referred to Probes as ‘method’ during our conversations, they were aware of the connotations of ‘method’ in contrast to the situated practice of Probes, positioning it closer to the understanding of ‘method as competence’ (Keinonen, 2009).

Each interviewee had their unique design vocabulary that could not be dissected from their phenomenological being, competencies, and disciplinary training. Drawing on their existing competencies and backgrounds prior to becoming a design researcher in HCI, which in some cases would come outside of a training in design, design researchers have been contributing to the increasing divergence and complexity of the already heterogeneous nature of design-led approaches to research in HCI. Due to the lack of shared vocabulary, the divergent approaches to design-led research started gathering under the umbrella term of ‘Probes’ on the basis of their approaching research different to HCI’s conventional ways and departing from Gaver et al.’s (1999) approach that is already well-known across the different communities of HCI. P7 explained what these different interpretations mean for Probes:

“Everyone’s gonna always develop some variation of the method [Probes] [...] I think that’s a good sign for the design research community [...] it means that ‘Okay, we’ve kind of internalised what a Probe was as a community and now we can just develop the one that makes the most sense to the project we’re in.’” – P7

Drawing on the lexicon of Probes brought legitimacy to their work which was highly contextualised and bespoke and involved a large amount of design activity. With all our participants, it was clear that they had reflected about what

a Probe is, as well as the connotations of the word. The term 'Probe' was often used in a retrospective manner when communicating the outcomes of such processes to refer to the becoming of these things. As such the fuzziness of the term, and its openness to interpretation, was both a weakness and a great strength. Probes as a term was seen to be a valued reference point that brought legitimacy to a broad set of approaches and communicated, in general terms, what researchers had set out to do. It's important to stress, however, that the multitude of interpretations of Probes across the interviewees did not necessarily mean they lacked a criticality around the use of the term, but was made implicit in the reporting on Probes. This will be explored further under the next theme.

5.5.2 What is the implicit 'research design' in design-led research in HCI? Crafting the socio-materiality of Probes beyond the artifacts

The literature on Probes focuses on their qualities as bespoke, beautifully crafted objects, failing to acknowledge the whole process of working with Probes as a 'crafted' process, too. While the artifacts themselves are crucial to the Probing process, so is the research design to incorporate these artifacts in the research. For example, the narrative underpinning the artifacts if there's any, the 'staging' of how Probes are introduced to the participants, the timeframe and frequency in which participants are meant to interact with the Probe artifacts, or the way exit interviewees are set up are aspects of Probe research design that are often under-reported. The soft skills were equally important as the craft skills when working with Probes for they required engaging people in the research process, which was also made implicit. P6, whose Probes served storytelling, emphasised the staging of Probes as 'showmanship' when working with Probes besides the literature's emphasis on 'craftsmanship':

"If you read about cultural probes, especially if you read the canonical kind of text, the point is there is this really attention to craftsmanship. [...] to my experience people don't give a crap about that. They're more interested in

receiving a mysterious envelope with missions [...] a little bit of showmanship. [...] I think that when we talk about probes showmanship and telling a good story is way more important than the material aspect of the thing that I give to somebody in hand.” – P6

The process of working with Probes entails a micro-scale design project within the larger design-led research. It involves a research design that is sometimes subsumed or enmeshed into the research design of the larger project they are meant to serve. In that way, Probes significantly differ from the use of artifacts for participatory research such as ‘Photovoice’¹⁰⁴. Such methods are used for research that also strives towards change, similar to design’s inherent critique of “changing existing situations into preferred ones” (Simon, 1996, p. 111), the change in such participatory social research is rather about equal representation in a given category than design-led research aiming to expand and even re-design these categories. This concern often manifested itself as subversion when working with Probes in design-led research. Whether using Probes to explore futures or to find alternative framings for a contemporary design situation, subversion was a key common concern for all participants. For some, subversion was overt in the topic of inquiry. For example, P8 used Probes to “*disrupt [...] stereotypical ideas of what a home is*”, not necessarily to represent or include the alternatives in that category, but re-design the category of home to ensure its future-inclusiveness. The desire to disrupt the trajectory of the present towards alternative futures was clearer in applications where the Probes were used as an entry point to an open-ended, unfinished design fiction. When distinguishing their sense of Probing from others, P4 hinted at the temporal qualities of Probes and their performance demands from the participants:

“these are not Probes in the Gaver sense [...] these artefacts are design proposals really of a sort, framed in a particular way, but actually for me, they are mostly about the ticket to talk thing, they’re mostly about being something to talk about and making that conversation easier, [...] I think the Gaver style of Probes relies on inspiration from what’s around you but [...]

¹⁰⁴ Developed by Caroline C. Wang in 1992, ‘Photovoice’ is a qualitative method that encourages self-documentation by marginalised communities to give them a ‘voice’ through photography.

when you're trying to get participants to think [in a] future-oriented way, you know, you have to pull them further.” – P4

However under-reported in the publications and made implicit, the research design for Probes was detailed clearly across the interviews. The process of working with Probes required an initial understanding of the context, whether through desktop research (e.g., P4 researching bridal magazines and services in order to understand their context), previous experiences (e.g., P3 reflecting on their own micro-transitions), or ‘informal’ fieldwork (e.g., P8 talking about their ‘participant zero’ who helped shaped the study through their conversations although not included in the ‘data’ for they never returned their Probes, as well as immersing themselves as design researchers in their context by attending relevant workshops etc). This was often followed by the designing the experience and making of the bespoke Probe artifacts (e.g., P1, P2, P3, P7, P8, P10, P12), which enabled design researchers to ask further, customised questions to their research participants, as well as to themselves. This was echoed by P8:

“I always thought of them as sort of physical questions, where you're making, in the making of it, you're working through some assumptions and you're kind of giving them to people to complete in, to interact with them in a certain way [...] it's not like a questionnaire or anything where very straightforward answer they can give.” – P8

The material qualities of Probes as part of their design were also critically important in how they engaged research participants in ways that more traditional methods and approaches would be unable to. Their specific value was seen in the translation of abstract concepts into embodied forms. P10 noted how Probes, in many respects, acted as *“embodied questions [...] a question that is translated into material aspect”*. The material qualities of Probes, and often that they were made specifically for a project or in some cases a specific participant, was felt to engage participants more deeply and avoid *“quite generic answers”* (P5) to questions, increasing the ‘credibility’ (Mattelmaki, 2005) and ‘sincerity’ (Gaver et al., 2004) and the ‘specificity’ (Fogg, 2003) of the approach. P3 articulated their way of understanding Probes as *“objects with questions”*, elaborating that: *“they're objects that ask*

questions [in] gentle, imaginative, surprising often ways. [...] usually Probes have a written question, but for me, the magic happens when you don't use often a lot of words, but the object itself asks the question [...] through the form, the materials." (P3). These custom-designed material qualities enabled asking more specific, yet open-ended questions to the participants for 'answers' that could yield more possibilities for further inquiry, design opportunities, and interpretations than deriving factual claims about the context of Probing. Moreover, demonstrating sensitivity to people's lives and attention to detail in customizing the experience and Probe artifacts often encouraged participants to reciprocate the design researcher's efforts and thoughtfulness in advance. For instance, after a set of initial visits to their participants' homes, P2 explained how they designed their Probes to make them "*fit in that space*" in a way that was "*highly curated [with] a lot of sensitivity to colours and design*". Beyond demonstrating thoughtfulness, it was an attempt to build relationships with participants: "*the Probes are a way of expressing a design intent and a design professionalism [...] they clue the participants into the kind of people that we are and give us a way of demonstrating, like building a relationship with the people as well, and demonstrating care and deliberacy.*" (P2).

This is not to say all interviewees supported this idea that the creation of carefully realised, highly polished, Probe materials was a signifier of care nor suitable for every context. As with any design process, designing Probes as tools to think with the participants required a good understanding of people's needs and contexts to encourage use. For example, P1 reflected that such designerly statements of care may also be viewed as an unintentional display of privilege and distance the researcher from their participants. In P1's context, where they were working with various marginalised communities and within refugee camps, care needed to be demonstrated by using familiar materials that "*are not saying [we are] being lazy*" but "*don't have so much inherent value in the material*". They further reflected:

"[in one case] it looked very refined and then participants in the camp were really hesitant on passing it around. They were hesitant with the children grabbing them and ripping them apart, so the formality of it, kind of in the material, the way that it looked, I think, wasn't the best [...] They need to be

very comfortable with the materials that they use, in the way that they express themselves, or else, again, it's me coming in with assumptions of what's the best way to design." – P1

However, even when carefully considered, the material aspects of Probes can also present some challenges. Several interviewees spoke of the ways in which their Probes at times challenged participants too much, as a result of their unfamiliar nature of posing questions compared to other, more commonly understood forms of research. Probes were sometimes seen as confusing, too abstract, or *"kind of obtuse, slightly complicated"* (P9) for research participants, where the openness of Probes could lead to exploration and uncertainty at the same time (Mattelmaki et al., 2016). Indeed, several participants reflected on how the material qualities of Probes needed to be considered with careful consideration for the specific contexts within which they would be used (Mattelmaki et al., 2016). For example, P1, who worked in refugee camps, pointed out to how materiality *"needs to be familiar, also needs to be something that they can relate to and see how it connects to our research, and also connects to their lives and understanding of lives"* in order to avoid creating barriers in between with their participants. Such concerns around wanting to do good for participants and demonstrating that through the considered labour in the creation and implementation of Probes was, however, often under-reported.

The literature's focus on the Probe artifacts over the Probing process, combined with the instrumentalised reporting on Probes that prioritise the Probe outcomes over the reflective practice of making and working with them, methodises them by reducing them to a mere use of artifacts for research rather than *"keeping design at the heart of Probes"* (Wallace et al., 2013, p. 3450). The under-reported aspects of crafting the socio-materiality of how Probe artifacts are made and implemented made Probe research design implicit, which is an essentially exploratory and problematising process that was based on creating difference and divergence (Marenko, 2019) as opposed to the understanding of method in linear terms to rationally solve a problem and reach closure. It further neglects the 'performance' aspect of Probes that is demanded both of the design researcher and the participants of

the Probes that involves different strategies for recruitment and engagement throughout the process of Probing. Crafting the Probe artifacts is certainly an important part of the design-led research that needs to be reported on explicitly, but so is crafting the gentle persuasion into the research process through the careful introduction of these artifacts to the participants.

5.5.3 Does HCI research care as much as the design researcher? Probes as subverting and facilitating small politics

Many interviewees would frequently speak about how their participants would react positively to Probes, and refer to the care and thought that had gone into their production. P5 noted how *“people were explicit about the fact that they liked these objects”*. By demonstrating care, it was also felt participants might be more inclined to reciprocate care back. P5 noted how their research participants appeared to feel it was *“necessary”* to show that *“care that had gone into fulfilling them and spending time and then taking the time to talk to us”*. Similarly, P10 reflected on how the considered creation of Probes would leave a *“good impression”*: *“I remember one saying, ‘Oh, you could have not bothered, you could have just done a questionnaire but no, you went into a lot of trouble’. And I think that really demonstrated my motivation, the effort I put in making those things for them.”* (P10). P2 further noted that the care is inherent in working to provide a unique experience through bespoke and customised artifacts: *“the process of having something bespoke designed for you, and then having that delivered and experiencing that is pretty amazing actually”*.

As such, Probes were seen as a way of manipulation or even coercion. Similar to P1’s reservations about working with well-crafted Probe artifacts in refugee camps as a display of privilege rather than care, P9’s work with the habitants of a conflict zone required further thought about Probe materiality for they could not even take materials with them for the purposes of research. Where care could not be displayed through materiality, P9 showed vulnerability by

expressing nervousness and openly discussing with the also-nervous participants the potential dangers of engaging with the research process, because the Probes would involve talking about politics and sharing those with the other habitants in such sensitive context. In order to explain how Probes work, P9 showed some of their previous work to exemplify the process, upon which the participants resembled the Probing process as *“tricking people”* in which the researcher is *“giving people stuff and then they’re, kind of, you know, playing with them or making things and then they’re talking”* (P9). With P9’s acknowledgment and further willingness to talk about the ethical matters as *“you’re, sort of, coercing people a little bit to, to like you, because you’re giving them something and then they feel compelled to respond in some way”*, the participants were intrigued by the Probes to see how it would work in their community and were indeed given the chance to navigate through these concerns. As discussed under the previous theme, the researcher’s soft skills and the way of introducing Probes to the participants played a huge role in Probe research design from then onwards.

There were other cases where this messiness of the situated practice of Probing blurred the boundaries between the researcher and the researched in challenging ways. P1 referred to the ongoing negotiations around *“consenting and re-consenting and re-consenting”* to make sure both their participants and they as the researcher were comfortable with their personal involvement in each other’s lives and boundary management during the research process. P1 reflected that *“we don’t report [this] much in HCI [...] when we are doing this type of work”*. Despite the challenges of working closely with people, closeness was not always a source of anxiety when working with Probes, but seen as a way of building trust and rapport with participants, especially for projects conducted over extended periods of time like P10’s. This was echoed by P11, who explained the act of handing over a Probe was *“like giving a gift to someone more even than you’re trying to get data yourself for your research”* (P11). At the same time, as P8 discussed at length in their interview, the materiality of Probes and their carefully thought through creation reflected the willingness and effort to *“give something of your own”*, to make participants not feel that they *“have to give me everything, instead of the designer putting*

something back” as they may in “*very researchy*” modes of engaging like questionnaires (P8). These examples overall demonstrate how Probes enable care through reciprocity by humanising not only the participants (Graham et al., 2007) but also the researcher, therefore subverting the idea of the researcher as a detached, neutral observer.

As in these examples contrasting design-led approaches to facilitating research with the traditional notion of research as something done by the researcher, the interviewees sought to challenge some of the taken for granted dichotomies between researchers and participants, especially in HCI research employing a range of disciplinary frameworks to conduct research and corresponding strict protocols in working with people. In certain cases, the relatively un-institutionalised nature of design-led research provided a higher degree of design researchers’ individual decision-making in the conduct of research with no imposed protocols to adhere to. In a way, it aligned with that notion of research as something done by the researcher, for design researchers and their subjectivity played the most important role in shaping the research than what’s imposed by the research frameworks. Having more freedom in decision-making, however, meant that they were burdened with more responsibilities, putting both the researchers and the research participants at more risk than the institutionalised research. The future-orientation and interventionist qualities of Probes and design-led research amplified these concerns, as explained by P9:

“there’s two aspects that design is working to achieve [in the project] facilitating these conversations with young people through Probes around their understanding of demolitions and what it means to them, and how they resist the [Anon.] occupation, and then we will take these kind of artifacts and use them to reimagine policy for the [Anon.] government and how they allocate aid [...] it’s much more about kind of future thinking than it is about how do we understand what is there now. It’s about how we reimagine [Anon.] policy.” – P9

One critical aspect alluded to by P9 here is the value of Probes and creative activities is in enabling participants to open up and engage in dialogues that involve subversion without necessarily open them up to potential dangers.

Continuing their example, P9 went on to explain the significance of this in their work:

“The strength of doing this is that because, if you try and ask somebody about politics within [Anon.], they either open up too much [...] or they won’t say anything at all [...] this is obviously about the challenges of the political situation, without being political with a big P, it’s like small politics, [...] it allows people some space to talk about politics, but in a safe way. [...] we put the [Probes] on the table, and people are immediately wanting to engage with them and are intrigued about what is in them and what the questions are.” – P9

There is an indication in the examples above that reflects how design dealing with the world as *it ought to be* subverts the hegemonic notion of research, which is about studying the world as *it is* (Simon, 1996). This was especially important for P1 and P9, in part because their work involved working with marginalised communities like refugees in camps or habitants of a conflict zone. P1 explained how they engaged in a process where their participants collaborated with them in selecting the methods of enquiry for the project. They noted how: *“they did have the option of an interview and a focus group that they’re like ‘Oh we’ve never done this method before’ [...] they afterwards told me, ‘Oh people always come here and interview us and leave’. Whereas when you start using design materials, you’re actually, you’re, you’re making a longer-term commitment.”* They went on to also explain that later into the research, one of their participants recounted to them how *“‘If someone comes here to just interview us and leave, we’re saying no’.”* (P1). In this regard, not only designing, but also conducting design-led research is doing *“small politics”* as described by P9, especially if aiming to engage people in the process in their own contexts. Indeed, P1 further reflected that: *“[For me] It’s all about creating shared understandings of what the research is, what the data is, of each other [...] the most natural things to do then, is, if you’re trying to create a shared understanding, it’s actually share the decisions regarding what to do.”* (P1).

The examples shared by P1 and P9 were the most explicitly politically charged contexts shared with us by interviewees, but this is not to say such ‘small

politics' and the creation of resources for did not exist elsewhere. For instance, in P2's work the notion of Probes being a resource for action was subtle; the Probes were to enable ways for their participants to reflect on and reconsider their experiences of their home. P10 was also involved in 'small politics' by giving voice to their participants through a manifesto that embodied their collective Probe returns and could be used as part of future advocacy activities. Similarly, P5 explained how a key component of their work was on eliciting alternative understandings from marginalised communities on cross-cultural heritage and sharing these back. They reflected that the legacy of their work, for them, is *"to think about, [...] what are our responsibilities towards this kind of material beyond just explaining people what we're going to do with it and going through ethics procedures and being upfront?"*. Again, this reinforced a view that for our interviewees Probes, and the wider projects they contribute to, aim to draw out oft-ignored narratives and concerns about matters that concern research participants, and challenge the taken for granted view that research is 'done' to people by researchers, who own the intellectual property.

Some interviewees also explicitly spoke about the 'small politics' of working in HCI as design researchers of cross-disciplinary backgrounds, and as a result caring more for the people for *what could be* in the contexts they work in than the disciplinary silos in knowledge generation as the legitimacy concerns around Probes and design-led research in HCI suggest. When asked about the challenges to working with Probes, it became clear that the issues around legitimacy were not resulting from Probes themselves, but from the higher-level issues around fitting such counter-hegemonic design-led research practices within the field of HCI. P8 emphasised that *"the reflexivity is so ingrained in the whole probe approach that it's, kind of, really forgiving"* in regard to framing the rich (referring to "the wide focus and the diverse and subjective ways in which the people have expressed themselves" (Mattelmaki, 2008, p. 76), yet fragmented and somewhat deemed invalid data they provide. P12 similarly expressed:

“I think these challenges [issues of legitimacy] don’t come from the Probes [...] that challenge comes from this kind of scientific domination, or the domination of scientific quantitative research that has in the past always been presented as more valid [...] and qualitative research is deemed valid in certain, sort of very regimented ways if it’s done almost scientifically, and also art-led research is considered valid in certain ways but not always and there’s very often this notion that it has to be validated in terms of how it will be evaluated [...] And so I believe that the limitations really rests in these frameworks of what is valid, if that makes sense.” – P12

What comes through the interviews is a level of sophistication in how the design researcher participants understood their Probes and the roles their materials were playing in relation to the existing practices and enabling people to move towards future situations. Furthermore, as noted for P8 and some other interviewees like P7, there were other inherently subversive aspects of care, which was to challenge the existing hegemonic practices and preconceptions about a range of issues related to conducting design-led research, in contrast with the normative stance of the researcher and the representative sampling strategies for research ‘facts’ to speak for the ‘researched’ people. Indeed, perhaps at odds with how Probes are often reported on in the literature, there was a clear purpose and intentionality in the creation of Probes beyond cheaply gathering data from participants. While one could read between the lines the ‘small politics’ of conducting design-led research in HCI, the interviews helped explore the lived experiences of HCI design researchers in managing the tensions between design and research when using design-led approaches such as Probes and revealed many important aspects of Probes than what is often reported.

Chapter 6 – Study II:

Dissemination of Probes in HCI

6.1 Introduction

Before conducting the first study and talking to design researchers on how and why they used Probes in their research and practice (section 5.1), I had considered the ambiguity of Probes as something to resolve and set out to complement the interview study with a review of HCI publications on Probes in order to guide novice researchers like myself in navigating the Probes discourse. I was interested in a sort of taxonomy of Probes, similar to Matthews & Horst's (2009) literature review of Probe interpretations based on their contributions to design knowledge. Upon completion of the first study, I became aware that the publications would only provide a partial understanding of the complexity around conducting design-led research in HCI. Many important aspects of Probes, including the reasons why design researchers chose to adopt the language of Probes, was made implicit in the publications (section 5.5). This illuminated the difficulties around demarcating or defining Probes to include in a desktop literature review as I had intended before deciding to talk to design researchers.

6.2 Aims and Motivations

This study was motivated by the findings from the previous interview study with HCI design researchers on why and how they used Probes as part of their Research through Design projects (section 5.5), in which I aimed to understand what a Probe is and the value of using designed artifacts in research. I was further intrigued by how design researchers made strategical decisions in the dissemination of their Probes to manage the ongoing tensions and debates around Probes and design-led research in HCI. In the previous study, because the goal was to get design researchers to reflect about their Probing practices, often times there were many overlaps with their publications that I used to identify and recruit them and these details did not necessarily

make it to the final analysis. Therefore, this time I limited the study goals to decision-making around dissemination for participants' specific publications on Probes in order to explore the specifics of their practices that are not reported in these publications, the material limitations of the different HCI venues and understand the context of these publications. This, in turn, required a different ethical strategy in disseminating findings. The research questions for this study were:

- How do design-led researchers who use Probes make decisions on what is included and left out when reporting and dissemination of their work?
- Why do design-led researchers leave certain key motivations, factors and aspects of their work out of published accounts?
- How might we encourage and support making explicit researchers' critical reflection and reflexivity through the conduct and dissemination of design-led research?

Below I provide a table to compare the two studies in terms of structure and how they contribute to the progression of this research.

Table 2. Overview of the two studies with design researchers

First study	Second study
Interpretation of Probes	Dissemination of Probes
Individual interviews	Focus group interviews
Semi-structured	Emergent
Anonymised	De-anonymised
How & why they used Probes	How & why they made use of Probes
Nuancing Probes in HCI	Nuancing <i>becoming a design researcher</i> in HCI
Motivated by <i>disciplinary anxiety</i>	Motivated to define design research <i>on its own terms</i>
Outsider positionality	Insider positionality upon CHI 2021 publication

6.3 Study Design

6.3.1 Method

The goal of this study was to unpack the decision-making around disseminating Probes rather than the intentions and the ways to adopt and use

them for research, although there could be overlaps as the first study revealed (section 5.5). The first study involved individual interviews with 12 design researchers; however, in this study I adopted a qualitative study of focus group interviews as the primary method of data collection. Focus groups are particularly useful to produce interaction between people who have shared an experience around a tightly defined topic (Clark et al., 2021). I was interested in what kind of specific questions based on these implicit practices around Probes and dissemination would be generated by a group of experienced design researchers for each other as opposed to me asking as a rather inexperienced individual. Based on Clark et al.'s (2021) summary, I will explain my reasons to use focus groups for this study:

- It allows understanding how people construct both individual and collective meaning through social interactions. While the design researchers have their individual interpretation of Probes that is unique and particular to them due to their different backgrounds and approaches to design-led research, all these divergences have come together under the concept of Probes.
- It allows to obtain more interesting, nuanced and realistic data by enabling the participants to probe and challenge each other. This was particularly desirable for this study, as the design researchers are the 'experts' of not only their own lived experiences around Probes, but also of their field for they have several publications on Probes and design-led research. Compared to the previous one-to-one interview study, the participants were more likely to be challenged in this study talking to each other rather than individually to me, ensuring a higher degree of accountability.
- It gives participants more freedom than one-to-one interviews. It is inherently participatory for handing control over to the participants, re-positioning the researcher, me, from an 'expert' position to a 'facilitator' one (Walters, 2020). While this non-hierarchical positioning can facilitate diversity and collective sense (Caretta & Vachelli, 2015), it could create a tendency for conformity (Merryweather, 2010).

- Because the participants discuss an issue as a group rather than as individuals, the group dynamics and emergent conversations could yield more interesting insights than one-to-one interviews. In my case, where the participants were the experts on Probes and their field, the relatively unstructured nature of focus groups to facilitate their conversation and intervene only with prompts where necessary seemed more appropriate than guiding them as with an ‘interview guide’ as in the first study (see Appendix A.4).

I organised 4 focus groups. Focus groups took place remotely on Zoom to account for Covid restrictions and allow international participants to take part. Each focus group was arranged based on participants and researcher’s availability and limited to maximum 4 participants per focus group. Prior to the focus group, a folder was shared with all participants containing selected publications from each member of that specific focus group (Appendix B.4). The expectation was that participants would review/familiarise themselves with the papers as a basis for the discussions during the focus group. Participants were encouraged to share via email questions or points of discussion to bring to the focus group: Only 1 did this.

In the end, the study design turned out to be quite different than the typical focus group and presented unique challenges specific to its format and participants. I’ve included some guidance on how to conduct similar studies for other topics in Appendix B.7 and would encourage design researchers to further engage with this kind of studies.

6.3.2 Study Ethics

This study was approved by the Faculty Ethics Committee at Northumbria University upon submission of a Full Ethical Assessment Form. The study posed minimal risks to participants taking part in the study and no risk of Covid-contact due to its fully virtual setting. They were fully briefed in advance to the study with a Participant Information Sheet (see Appendix B.1), giving them enough time to share their questions with me before agreeing to take part.

They signed a consent form (see Appendix B.2) prior to the interviews, were reminded before, during and after the interviews that they could pause or withdraw from the study at any time before a given deadline. At the end of the interviews, they were also debriefed. The video recordings of each focus group was shared within the groups for confirmation and further comments prior to sharing with the larger group of design researchers who took part in the study. This was especially important to compensate for the shift in accountability in making them talking to each other than only to me as the principal researcher.

Differently than the ethics of the first study (section 5.3.2), the participants were informed that they would not be anonymised to acknowledge their contribution to the research, for they were the ones that were the experts of their own lived experiences, but also of their field of research with several publications. Furthermore, it enabled getting into the specifics of their practices around Probes, from the research design to the dissemination, staying true to the particularity of design-led research practices.

6.3.3 Participant Recruitment

I followed a similar approach for participant recruitment of the first study where I focused on the ‘Cultural Probes’ end of the Probe spectrum in HCI, where I started by listing the ‘empirical’ publications on Probes (i.e., those that talk about their use of Probes for research in various contexts) on ACM Digital library as the main HCI database. I included those with explicit reference to Gaver et al.’s (1999) ‘Cultural Probes’ or Wallace et al.’s (2013) ‘Design Probes’ as the umbrella term for the diversity of design-led Probe interpretations in HCI. However, I excluded those referencing Mattelmäki’s body of work on ‘Probes’ as a ‘design method’, because that understanding of Probes belongs to a specific design program within the domain of user-centred design and should be read alongside what method means in design (Keinonen, 2009) and its transferability (Lee et al., 2011; Lee, 2012), in comparison to the conceptual and methodological ambiguity of Probes in HCI. Those that were citing this body of work also turned out to be more pragmatic and difficult to identify the underlying ‘interpretation’ of Probes as a concept.

In a few cases, the term 'Probes' was vaguely used to describe a design-led research process without an explicit reference to any of these key Probe publications (Helms, 2017). In another, references to both 'Cultural Probes' and 'Technology Probes' were made with an explicit discussion of how they were understood differently (Schulte et al., 2016). Because I did not want to demarcate and impose a definition of Probes on the participants but rather wanted to negotiate and explore the boundaries of the concept with the participants if they wished to do so, I kept such publications in the list of potential participants to recruit and noted my interest as such in the initial contact e-mail (see Appendix B.3). The increasing number of Probe interpretations enabled narrowing down the timeframe of publications for recruitment down to last 5 years in order to explore more contemporary practices and discussions around Probes in HCI.

The main difference in recruitment strategy was selection and curation of publications in terms of format, venue and their conceptual contribution to the Probes discourse through an explicit discussion of an under-articulated aspect of Probes that would enrich the group conversations later. The variance in dissemination strategies of design-led research in HCI were more important than that of the contextual interpretations of Probes for this research. Therefore, I ensured the publications were published at an HCI venue or included an explicit mentioning of working in HCI as a field. I aimed to curate different formats and venues where I could in order to explore the effect of different review processes and audiences in the dissemination. I identified the use of RtD, co-design, or participatory design as different design-led approaches to research mentioned in the potential list of publications and I excluded the ones that used Probes for purely artistic research or merely data collection. Additionally, I aimed to curate publications that touch upon some under-articulated aspects of Probes, like the role of artifacts in RtD (McKinnon & Foth, 2017), interpretation of Probes as a concept (Encinas et al., 2018), detailing design process of Probes rather than their outcomes (Boucher et al., 2018), or the invisible emotional work for Probes (Rob Comber's reflection in Balaam et al., 2019). For those that had more than one publication on the same project, while I suggested a publication in my initial contact e-mail, I gave

them the option to choose another and/or include excerpts where relevant. As a result, a few participants discussed with me a change of their publication (participants: CRG2 ABe, CRG2 HM, CRG3 BS) prior to forming and informing the separate groups on their list of readings.

6.3.4 Data Collection

All four focus group interviews took place virtually across different locations via Zoom. I will refer to the focus groups as critical reading group (CRG) to maintain how we referred to them in the groups. Each group started with a brief snapshot of personal introductions, a snapshot of the project and the context for the publication shared prior to the group to be read by the other participants. Once everyone took their turn, the conversation was then followed by an open discussion. This took place naturally in different structures in each group. For example in CRG1, the participants themselves adopted a structure where they took turns to speak uninterruptedly for longer durations, whereas in all the other groups, it followed a more natural conversational flow with minimal intervention from me. I took part in the conversation only if asked a question, except for in CRG2, where I asked a prompt question to open up a conversation around revisiting previous work.

All four focus group interviews were video recorded using Zoom's recording feature. The length of the video recordings ranged from 1 hour to 1.5 hours. In order to make the video recordings more viewer-friendly, I did minor edits to remove the long pauses or technical errors and added timestamps for the individual introductions and open discussion before sharing each video recording with the corresponding group on Dropbox. I gave the participants a deadline to respond if they wanted to add further comments or corrections or withdraw from the study if they did not want their video recording to be shared with the other groups that took part in the study. As a result of this, only one participant (Jeanette - CRG1 JB) asked for a note to clarify their slip of the tongue. I added this note as a subtitle on the video recording and also edited the transcripts later. I then made the 4 video recordings accessible to the larger

group as a whole, e-mailed them with the Dropbox link, asking if they had further comments, questions or concerns.

The audio recordings were then transcribed by professional services.

6.3.5 Data Analysis

The first study showed that anonymising the participants did not benefit the specifics of their practice. In this study, I chose not to anonymise the participants, mainly to talk about these specifics about their Probing practices and publications that are already de-anonymised, but also to maintain the degree of authenticity to their lived experiences and to the sincere and casual nature of the conversation in each group. For that reason, it felt natural to keep how they addressed one another on a first-name basis in the focus groups throughout the text, while I still chose to use 'participant codes' to mark the group number and the transcript lines to help locate the participants quotes for the interested reader. For example, the participant code **CRG3 EE: 32-37** stands for:

- **CRG3** indicates the critical reading group number, 3;
- **EE** are the initials of the speaker, Enrique Encinas;
- **32-37** are the line numbers in the transcript of this group.

For data analysis, I followed Braun & Clarke's (2013) suggestions for conducting thematic analysis in six main phases, which are as follows:

1. Getting familiar with the data: I listened to the video recordings several times to edit out the long pauses and technical errors towards making them more viewer-friendly before sharing them with the individual and then the larger group of participants. This helped immerse myself in the data and I started making analytic memos on a Miro board for emergent patterns and potential links between different groups (Saldaña, 2013). I listened to the full recordings several times to ensure the accuracy of the professional transcriptions. I made notes of the parts where participants shared their screen, other publications if they referred so, and the flow of the conversation that happened differently in each group. For example, participants of CRG1 maintained turn-taking after

the initial introductions, while in other groups, the conversation happened more casually after the initial discussions. As a result, I made notes of where their responses to each other needed tracing.

2. Coding: While keeping the Miro board of analytic memos to remind myself of how the conversation built up, I printed out the transcripts and started coding the data using highlighters and pens in turns. Out of the first cycle coding methods (Saldaña, 2013), I particularly benefited from the use of attribute coding as notations to manage the large amounts of data, structural coding to relate the data to the research questions, emotion coding to mark the emotions expressed by the participants about their lived experiences, and versus coding for many comparison and contrasts that were made between different notions. For example, conventional HCI approach vs design-led approaches, conventional methods vs Probes, academe vs industry, and subject vs object of research in reference to participant agency. Coding was often done by sentence or a coherent group of sentences that explained a particular aspect as a whole. In the latter case, the group of sentences was broken down into fragments and assigned additional codes. For example, in the excerpt below, the interviewee explains the politics of terminology and how it affects narratives in dissemination in the longer term:

“So I think these politics with the words that we use, but I also think there’s something with these ongoing conversations and papers and how papers and these stories being shared and packaged in particular ways, the life that they take, that’s ongoing, it’s not... even some ways it’s often positioned as being a final output but it’s really not, which I think is also really interesting to the politics of the words we use and how we I think position what we’re doing, and I think probe being a very great example of that.”

Key codes for this excerpt were ‘dissemination narratives’, ‘politics of terminology’, ‘citation for positioning’, ‘ongoing life of publications’, ‘disciplinary baggage’. In the second cycle coding, these led to ‘design publications as cultural text’, opening up potential ideas for interpretive

reading strategies, alternative formats for dissemination and alternative archiving strategies in the scholarly databases for publications to facilitate revisiting previous work. 'Politics of terminology' and 'citation for positioning' also led to further second-cycle codes of 'design divergence in HCI', as well as relating these issues around the review processes in HCI, for citations were often used as implicit means of positioning to get through the double-blind peer review processes without breaching anonymity in a similar manner to identity-signalling.

3. Identifying potential themes: Thinking of themes as having a "central organising concept" (Braun & Clarke, 2013, p. 224), I started organising codes into themes that bring together different aspects of a concept. As advised by Auerbach & Silverstein, (2003), I kept a consideration for how these themes would respond to my research concern and study goals, how they would fit in my theoretical framework. In order to ensure reflexivity, I also kept asking myself what surprised me to track my assumptions, what intrigued me to track my positionality, and what disturbed me to track the tensions within my value, attitude, and belief systems about what participants talked about (Sunstein & Chiseri-Strater, 2011). Often times, a single meaningful excerpt generated codes that would be organised under different themes. For example, referring back to excerpt above, the code of 'design publications as cultural text' pointed out that reading a publication on Probes is indeed an actively creative, interpretive process that is contingent to the reader's subjectivity and this process is often made implicit in the publications referring to Probes. Bringing this together with other codes that brought up the decontextualisation of Probes through dissemination, I generated the theme of 'invisible work of probing the knowledge in publications on Probes'. The 'invisible work' here is indeed a reference to Daniels' term (1987), indicating my stance on the unrecognised and potentially devalued work that design researchers engage in spite of the 'methodised' uptake of Probes in HCI.

4. Reviewing potential themes: For practical reasons, I broke down larger themes into smaller sub-themes. Because I adopted a combination of top-down and bottom-up approach in this research to relate the debate around Probes in HCI and what's made implicit in their 'methodised' dissemination to the historical issues around design-led research that are also made implicit through the adoption of 'RtD' as a methodological shortcut in HCI, sparking debates around the legitimacy of design-led approaches to research. As a result, I reviewed and organised themes going from the more specific to more general, particular to abstract, specific to political, problems to potential solutions, from Probes to design-led research in HCI.

5. Defining themes: Braun & Clarke (2013) suggest defining themes as a boundary-making practice for the scope of the themes. I first wrote extracts for the key points of each theme, followed by one-sentence summaries for each theme allowed me to see how these themes build up from specific problems of the present context of conducting design-led research in HCI in relation to Probes towards potential solutions to alleviate those. During this phase, I edited and reviewed themes as needed.

6. Writing up: Defining themes was a helpful exercise in making the analysis not just a presentation or description of what was being said, but rather as "a deliberate self-consciously artful creation by the researcher [which] must be constructed to persuade the reader of the plausibility of an argument" (Foster & Parker, 1995, p. 204). In doing so, literature and research goals was embedded throughout the analysis.

6.3.6 Limitations

As with any focus group bringing people together to discuss a topic, there could be limitations to this study in terms of authenticity. The design researchers recruited for this study brought together very different backgrounds and perspectives, where at times it seemed as if the only

common point of reference was the dissemination decision they've made in reference to Cultural Probes. However, the unstructured nature of focus groups resulted in emergent conversations on different aspects of Probes and conducting design-led research in each group that would not have otherwise happened if I was to conduct one-to-one interviews. On the other hand, the concerns for authenticity could be amplified due to the de-anonymised nature of the study. However, having stated the overall research aims and the research questions of the specific study right from the initial contact e-mail along with the Participant Information Sheet, the design researchers were fully aware of the implications and even showed enthusiasm for the given opportunity to speak honestly about the collective concerns around Probes and design-led research that are made implicit, as expressed by some participants in the conversations and/or via private e-mail upon signing up for the study. As the findings demonstrated, design researchers indeed felt comfortable with each other to provide very honest individual accounts of how they have been navigating the heterogeneity of design research across different programmatic approaches to and departmental configurations of design research, as well as the HCI landscape. As a result, it would not be wrong to say that this study validated these ongoing issues and is a step in tackling them by allowing the space to openly discuss them while acknowledging that it won't offer solutions.

6.4 Overview of Study Participants, Publications, Probes & Emergent Conversations

6.4.1 Overview of Study Participants and Publications

Due to the size of the table, I put the table in the appendices (Appendix B.5). In the next section, I'll briefly present the publications discussed and the emergent conversations.

6.4.2 Overview of Probes and Emergent Conversations

My recruitment strategy aimed at bringing together critical perspectives to Probes in order to discuss the complexities around design-led research in HCI. As a result, each design researcher had unique interesting points of discussion, contexts, and dissemination choices that motivated their invitation and participation, leading to spontaneously emerging themes in each group based on these. These emergent themes highlight an aspect of Probes that is under-acknowledged in relation to the findings. These are discussed below.

CRG1: Intimacy

In CRG1, the conversation revolved around the intimacy afforded by the probes and the manifold challenges it brought for the researchers. Dan Lockton's (Lockton et al., 2020) paper reported not on his own, but his students' "self-probes" made by themselves, for themselves. These probes aimed to explore the very personal and intimate aspects of sleep as the students desired. It offered almost a solipsistic level of intimacy, in contrast to the more common use of probes to study others' intimate worlds. Eleanor Chin Derix's (Derix & Leong, 2020) paper reported her use of probes to explore the individual perspectives within the oft-homogenised category of 'parents'. She used probes to nuance and push the boundaries of a conventional 'user' category by revealing the complexity within families. Similarly, Jeanette Bell's (Bell & Leong, 2019) paper reported on her use of probes to nuance and extend the category of "people with dementia" onto younger demographics. This nuancing required a departure from most HCI research on dementia by a lack of proxy to communicate for the person with dementia due to their greater level of agency and autonomy in the research process, enhancing the level of intimacy in the research. Karey Helms' (2017) short paper reported on her autoethnographical work with her partner, which was ongoing at the time of reporting, as part of her larger body of work on intimate bodily interactions & care.

It's also worth mentioning that the participants' background in the industry (CRG1 ECD, KH, JB) or industry collaborators (CRG1 DL) enabled some comparisons of design research and the industry practices.

CRG2: Making

In CRG2, the conversation accentuated making and its ‘under-acknowledged’ contribution in HCI. Andy Boucher’s (Boucher et al., 2018) paper reported in detail on the making of TaskCam as part of the ProbeTools that aimed to update the original spirit of Cultural Probes and create open-source resources for self-built tools for Cultural Probes studies in collaboration with Bill Gaver, who was amongst the originators. The paper focused on the design process of the specific Probe artifact, TaskCam, and the issues that arose from open-sourcing a design methodology rather than instrumentalised reporting on the outcomes of Probes. Arne Berger’s (Berger et al., 2018) paper reported on their participatory exploration of smart home devices and interactions with IoT sensors. The paper included a brief reflection of whether these artifacts were Probes because they were used to make sense of sensor data together with users within a Probing approach rather than using the sensors as Probes to collect data about them. Heather McKinnon’s (McKinnon & Sade, 2019) paper reported on the use of design research artifacts made from recycled household materials to explore the notion of self-sufficiency and frugality within the home environment. It reflected on how the materiality of their Probes encouraged participants agency and self-reflection from a methodological perspective rather than the empirical findings, emphasising the value of bespoke design research artifacts for participant engagement in design-led studies.

CRG3: Speculation

In CRG3, the conversation centred speculation as the key aspect of any design-led study. Enrique Encinas’ (Encinas et al., 2020) paper elaborated on making metaphysical ideas explicit through their use of Probes as part of a workshop rather than for data collection. It included an explicit articulation of their understanding of the original concept of Probes and their interpretation. Doenja Oogjes’ (Oogjes et al., 2018) pictorial described a Probe study with ‘alternative’ dwellers to expand on the normative notion of ‘home’ in HCI research and practices and presented the subsequent speculative concept design proposals from these insights. It made use of the visual qualities of the

pictorial format to convey the materiality of Probes that were central to the context of the study, as well as their critical design approach of ongoing questioning in the dynamic form of thematic collages of interpretations. Britta Schulte's (Schulte et al., 2016) paper reported their use of 'design fiction' as Probes to elicit open-ended responses from potential users of a technology before it became a reality, detailing the under-reported process of writing design fictions. The paper made a distinction of Probes as a research tool or a design method and included a conceptual discussion of whether these 'design fiction Probes' were Cultural or Technology Probes, highlighting some of the methodological challenges to working with Probes in HCI.

CRG4: Participation

In CRG4, the conversation explored participation and agency, with questions ranging from the intention to participate to the agencies of networks, people and materials involved in the research process. Chris Elsdén's (Elsden et al., 2016) paper reported on their use of Probes to sensitise participants on the notion of 'lived informatics' prior to and as the key artifact at a workshop set up as a 'speed-dating event'. By curating their data profiles for the event where they were used as a means of interaction with the other participants, the participants engaged in live performing, articulating and negotiating of data through these Probes rather than returning them to research team for analysis in a typical Probe process. John Mills's (Mills et al., 2018) short paper reported on their use of custom-designed IoT artifacts as Cultural Probes in a multidisciplinary project to explore how people interact with the news by encouraging active reflection in the context of news-reading through these artifacts. Unlike many other participants, John and his multidisciplinary research team did not include design researchers and instead worked with an industry partner for the creation of Probe artifacts. Susanne Hensely-Schinkinger's (Hensely-Schinkinger et al., 2018) paper reported on their use of Cultural Probes as an additional method to a multi-method, long-term qualitative inquiry into the context of informal caregivers. The research was carried out by a multidisciplinary team of information and social scientists adopting Probes for their empathy and engagement capabilities to deliver

information that is not always accessible through interviews or observations with the informal caregivers, wary of the implications of 'culture' in Cultural Probes and potential misappropriations to replace ethnographic inquiry. Tom Jenkins' (Jenkins et al., 2020) paper reported on their use of Probes to involve experts in collaborative speculation on a potential design space for self-tracking in the context of the emergent science of 'gut-brain axis'. Due to the parallels in-between the exploratory aspects of Probes and the uncertainty of an emergent science, the explicitly critical stance of Probes helped facilitate the experts' own experiential understanding of the issues behind an emergent science rather than studying the body in the conventional self-tracking manner.

6.5 Findings

Overview of Findings and Guide to the Reader

The findings are presented in order from the more specific to more general, particular to abstract, specific to political, problems to potential solutions, from Probes to design-led research in HCI. They can be summarised as follows:

- **Implicit knowledge and practices around Probes for inclusion in HCI:** *This theme explores how design researchers navigate the methodological aspects of design-led research within the HCI research frameworks and the role Probes play throughout this journey.*
 - Becoming a design researcher: The ambiguity of literature on Probes as 'rite of passage': The ambiguity of the literature makes it intimidating for newcomers or disciplinary outsiders to get started with Probes. However, navigating this ambiguity is a 'rite of passage' for becoming a design researcher in HCI. (section 6.5.1.1)
 - Handling uncertainty in design: The ambiguity of Probes for risk management in HCI: Adopting the versatile language of Probes leaves design researchers methodological elbow room for managing the expectations around 'knowledge contribution' and the gatekeeping of design-led terminology in HCI before

- investing in the uncertainty of the design-led research processes. (section 6.5.1.2)
- Following the ways through: Citation as a means of anonymous positioning in HCI: Citation is implicitly used as a means of connecting to previously-accepted narratives to position oneself through the anonymous submission processes in HCI, as well as to justify all kinds of design-led work. However, it creates new norms and practices around the dissemination of Probes in the longer term. (section 6.5.1.3)
- **Decontextualisation of Probes through HCI dissemination:** *This theme explores how the ill-fitting ways of disseminating Probes in HCI furthers the contrived distinction between design and research to spark the legitimacy concerns around design-led approaches to research.*
 - Losing the sight of the big picture, specifics, and the context of Probes for 'relevance' to HCI: Probes exist in a much bigger picture of design-led research, but are often decontextualised when trying to fit them into HCI's evaluation criteria. (section 6.5.2.1)
 - Designerly ways of seeing: The invisible work of probing the knowledge in HCI publications on Probes: The decontextualised and instrumentalised reporting on Probes requires probing the knowledge in a publication, but this capability may not be accessible for everyone. (6.5.2.2)
 - **Alleviating the 'methodisation' of Probes in HCI:** *This theme explores the more specific problems around Probes in HCI and the potential solutions suggested by the participants to alleviate those.*
 - Mitigating the material limitations of HCI publications for design reflexivity: Material limitations of the typical HCI dissemination formats and a lack of collaborative tools for alternative formats reinforces HCI's methodisation of Probes and similar design-led approaches. (section 6.5.3.1)

- Probes as journey: Going beyond the prevailing narratives of 'efficiency': HCI's scientific origins and connections to industry manifests itself in the underlying 'efficiency' rhetoric, which contributes further to the decontextualisation of Probes by evaluating them solely on their outcomes. (section 6.5.3.2)
- Unblackboxing design-led research: Creating Probe resources: Creating Probe resources can mitigate the methodisation by shifting the focus from their outcomes to the Probe process itself and the diversity to these artifacts and processes. It could also serve as a source of inspiration for those wanting to get started with Probes. (section 6.5.3.3)
- **Creating a design and design research culture**: *This theme situates the complexities of conducting design-led research within academia that lacks a design research culture.*
 - Overcoming biases and institutional constraints working against the 'designerly': Design's 'novice' position in academia has settled extrinsic and biased understandings of what design can do as a research discipline, while its 'in-disciplinarity' created divergence in the plurality of approaches to design-led research. Therefore, individual design researchers are burdened to deal with these biases in a wide range of contexts, while having to defend design's disciplinary integrity. (section 6.5.4.1)
 - Alternative formats and processes for disseminating design research: The need for enacting a paper by 'probing the knowledge' suggests that the dissemination format needs to reflect the phenomenological, open-ended, incomplete, provisional nature of design-led knowledge. (section 6.5.4.2)

Each of the themes and sub-themes will be presented in the findings below.

6.5.1 Implicit knowledge and practices around Probes for inclusion in HCI

6.5.1.1 Becoming a design researcher: The ambiguity of literature on Probes as ‘rite of passage’

Probes were particularly valued amongst the participants for facilitating a re-orientation of design practices from fulfilling market and industry needs towards knowledge production. For those coming from a prior design background of such orientation, Probes were considered to be “*almost like a rite of passage for a design researcher*” and many other newcomers for “*open[ing] up a different conceptualisation [of] what design can do [...] to know*” (CRG3 EE: 32-37). The divergence in the intentions to use Probes and their wide range of materiality across the participants was picked up right away. Tom pointed out to ‘Cultural Probes’ (Gaver et al., 1999) as the origin of “*this questioning style*” (CRG4 TJ: 413-426), whereas Chris further acknowledged that the derivations of Probes (e.g., ‘technology Probes’) or similar approaches to using artifacts in design-led research (e.g., ‘research products’) “*tend to be slightly more focused*” in comparison to the progressive accumulation of diversity under the umbrella term “*design Probe*” in HCI (CRG4 CE: 428-439). As a result, while the original concept of ‘Cultural Probes’ remained an inspirational repository for further forthcoming interpretations, the category of ‘Probes’ were rather decontextualised, about which Dan expressed his ‘frustration’: “*I’m not entirely satisfied with that, [...] and I’m like, “Well everything’s culturally situated, everything is designed”, whatever*” (CRG1 DL: 317-335).

Therefore, the discourse on Probes was found to be quite contested and unable to offer much guidance to those wishing to work with Probes despite the abundance of canonical Probe-interpretations. For example, Eleanor recalled her own experience with the Probes discourse as a PhD student as a “*very slow journey of initially coming in and being intimidated by everything and assuming that everything that’s come before is correct*” (CRG1 ECD: 446-450) to growing more critical of the discourse, reflecting the confusing experience of many newcomers including mine. Similarly, Doenja articulated

the ambiguity around them by commenting that *“it’s this thing that’s been around for so long and everyone knows it but no-one really knows it either, it’s just this funny in between design thing.”* (CRG3 DO: 90-93). While their decontextualisation eased the appropriation of Probes for one’s research easier, it resulted in an ambiguity to what they are.

The academic discourse provided an opportunity for dialogue in comparison to the context of competing industry practices and thus was highly valued, but not for Probes. Despite the growing interest in design-led research practices in HCI, the convoluted discourse and the instrumentalised reporting on Probes that focus on their outputs made it difficult, if not implicit, for newcomers to know where and how to get started with Probes. Even the more contemporary work on Probes was found unhelpful to set eager researchers in motion, who got *“no idea from reading 20 years of work”* due to the ‘mystification’ of Probes and *“all the language around it”* (CRG1 ECD: 566-603). Aggravated by the disciplinary anxieties in entering the HCI research domain from design background, this was found to create further ‘nervousness’ around working with Probes within the academic context, as well as ‘inhibiting’ especially newcomers from ‘just getting in and doing it’:

“it’s troubling that I’ve heard [...] people saying, “I’m going to use Probes and I have no idea what to do, would I be able to have a conversation?” and I think then something’s going wrong in how we’re writing about Probes because that shouldn’t be the case, it’s decades of having a method” (CRG1 ECD: 591-693)

As a result, newcomers were made dependent on their networks and proximity to the opportunities for “learning as increasing participation in communities of practice” (Lave & Wenger, 1991, p. 51) to get started with Probes. This is not to blame design researchers who published on Probes for ‘not sharing enough’; the tacit qualities of Probes as a practice ultimately depend on that learning in such ways. It was also noted that few examples like the Probe

design ‘framework’ of Wallace et al. (2013)¹⁰⁵ aimed to alleviate this sense of anxiety and gatekeeping of design know-how around Probes, wary of the loose use of the word ‘framework’ to denote to “*just some guidance*” for the “*researchers coming in*” by “*allowing flexibility and for people to adapt them and that these are not prescriptive*” (CRG1 ECD: 584-591). Eleanor further noted that once she reached the other side, she felt “*a sense of relief*” after “*a first run at using Probes*” (CRG1 ECD: 598-603) and started seeing the ambiguity around Probes in a different light: as a valuable trade-off that allowed for some elbow room for the methodological uncertainty around the situated practice of Probing “*in order to preserve a sense of [...] not wanting to pin things down too much*” (CRG1 ECD: 592-598), especially in the HCI context where their uptake has likely been less critical (Boehner et al., 2007). Furthermore, gaining experience and competence with Probes indeed resembled a ‘rite of passage’ for design researchers. Firstly, the learning experience was far from a process of incorporating external knowledge as an individual participating in their communities of practice due to the tacit qualities of Probes. Secondly, navigating the Probes discourse ‘successfully’ certainly required newcomers to build confidence, but also a ‘culture’ around Probes to unlock their ability to generate the increasingly divergent interpretations, if they were not internalising the culture accessible to them. As the newcomers gradually learned to weave themselves into the fabric of their natural, social, and cultural worlds in the process of becoming a design researcher, they developed an agency to further dwell in and also manipulate these worlds in a ‘learning as dwelling’ (Plumb, 2008) manner. Hence, it becomes less surprising that many participants who worked mainly with Probes as part of their PhD studies, like Eleanor, Britta, Enrique, Jeanette, Heather, and also Tom¹⁰⁶, mentioned or at least implied that their original plans to work with Probes to inquire into a context took inevitable methodological turns

¹⁰⁵ Upon trying out and benefiting from Wallace et al.’s (2013) ‘framework’ for her own Probe design process, Eleanor published a follow up paper titled “Towards a Probe Design Framework” (Derix & Leong, 2019). It’s not very common for design researchers to take an existing ‘framework’ and build upon it, because of the ‘irreplicable’, provisional, and situated nature of design research processes.

¹⁰⁶ Although Tom did not take part in the study with a publication from his PhD studies but with a more recent publication, he often referred to his experiences with Probes during that time (Jenkins, 2018).

throughout their PhD journey. That is, they ended up inquiring into the methodological aspects of Probes that fell through the cracks of the literature more than they had wished to do so, indeed quite similar to my own experience with the progression of this research.

6.5.1.2 Handling uncertainty in design: The ambiguity of Probes for risk management in HCI

Setting expectations for outcomes at the beginning of a design-led research process was found to be difficult due to the unfolding nature of situated design-led processes and the underlying speculative concern for *what could be*. As a result, design researchers often had to post-rationalise the process when disseminating in order to communicate this uncertainty to those that may have more predetermined expectations from a research process. Despite its familiarity to the diverse communities across HCI as a design-led approach to research, this was where especially the methodological ambiguity of Probes came in handy. For example, Jeanette, who published on their use of Probes upon the completion of the project, described making terminological choices as “*retrofitting what we’re doing into some type of rhetoric language*” (CRG1 JB: 339-342). For example, Chris and his collaborators did not set out to work with Probes, but upon realising that they’d be sensitizing their participants in advance of the workshop using these research artifacts was “*implicitly quite similar*” to the cultural Probes, they made a reference to Probes in their paper “*without being too bothered about definitions*” (CRG4 CE: 389-405). Similarly, Arne explained how their paper came to refer to Probes with a brief discussion of terminology that signalled the internal disagreements within the research team on whether their open-ended but quite technical use of the sensors would fit better into the definition of a ‘toolkit’ or ‘Probes’ (CRG2 ABe: 48-63).

When not retrofitting but reporting at the initial phases of a design-led research project, the uncertain nature of the process almost necessitated the adoption of the ambiguous term ‘Probes’ in order to avoid prescribing a methodology and manage the expectations for ‘knowledge contribution. Tom mentioned how Probes were “*very different from how we think about the research*

methods, [...] kind of haphazard, not [...] intentional, but also not directed" (CRG4 TJ: 771-775), therefore the intentionality in the design and use of the Probe artifacts in the research process were not able to anticipate the potential outcomes. Instead, the methodological ambiguity surrounding Probes seemed to offer this flexibility that was much needed in order to take the "*leap of faith*" (CRG3 EE: 182-186) to commit to the uncertainty involved in making and delivering the Probes as part of design-led research, like in any other creative endeavour (CRG2 ABo, CRG3 EE). However, it was acknowledged that Probes involved several factors unsettling the process to create further uncertainty. For instance, Tom talked about his 'unsuccessful' experiences in making Probes work during his PhD and also referred to his current experiences of teaching Probes as a 'method' to exemplify how the process is "*so deceptively simple and incredibly hard to do and requires such thought [...] and also can't easily work in the two or three weeks we really have to do a Probe study*" (CRG4 TJ: 641-644). Probes involved more uncertainty when working with people for it offered more empowered, open-ended ways to engage with the research and the research team in comparison to the lesser degree of flexibility and participant agency in conventional methods. Where the latter created an illusion of having control over the process, it was described as "*the methods barrier*" (CRG1 JB: 79-82) by Jeanette, who came into the field of HCI as a design researcher from medical sciences background. She further expressed that she was 'heartened' to find out about the 'humanity' of HCI research compared to her previous scientific practices and indeed considered herself "*really lucky to be challenged from the beginning with having to close the gap between researcher and participant*" (CRG1 JB: 645-660). To mitigate these challenges arising from the inability to fully construct a participant journey when designing Probes, Chris brought up the idea that good Probes need to include "*a number of touch points*" and provide the participants "*a sense of the bigger picture*" and different options for engagement, but recognised the element of luck "*that things just land at the right moment in their schedule, lives and whatever*" (CRG4 CE: 271-279). To sum up, the uncertainty of the process of working with Probes for the most part stemmed from their care for the 'humanity' of the participants with their own

routines and agency in contrast to an imposition of the research through the 'method'.

To put simply, Probes signalled a highly risky investment due to the uncertainty of the process and this was indeed a twofold investment that required convincing the industry partners to fund a project or, the reviewers in the academic context to have faith in the knowledge contribution of a publication. For example, in Eleanor's case, industry partners "*worrying about a lack of return on investment*" would "*want to know what they're going to be getting before investing in something and it's totally foreign to them not to know what they're going to be getting*" (CRG1 ECD: 269-281). When working within an interdisciplinary academic team as well as industry stakeholders, there could be further "*internal team tensions*" like in John's case, where the industry partners embraced the Probes as "*an exotic thing that had an asset in and of itself when you spoke about the work*" (CRG4 JM: 560-567) in contrast to the apprehensive reception of Probes by the rest of the research team who were more accustomed to prescribed methodologies with predetermined outcomes. He explained, for instance, that there were "*some really fundamental methodological disagreements around what this information [from Probes] actually could be utilised for and how it should be utilised*" (CRG4 JM: 141-150) with the behavioural scientists involved in the project. Whether convincing the industry partners, team members from other disciplinary traditions in a multi- or inter-disciplinary context, or the reviewers to invest in the uncertainty of the design research process, the methodological ambiguity around "*the span of things which are called Probes*" ranging from Probes to design intervention was found to be useful in order to manage the 'contribution' expectations, with a lot of attention paid to "*pros and cons of using those terms*" (CRG1 ECD: 254-260). Probes as a term was more likely to be 'loosely' adopted in the publications rather at the beginning of a project as an "*escape plan*" for not knowing what may happen, especially when involving oneself in an autoethnographic process (CRG1 KH: 387-403) or "*exit strategies*" (CRG1 DL: 497-502) for when things may not work in the way hoped. In parallel to that, it was observed in some participant papers that the use of the term

Probes was dropped in the following publications on the same project (CRG1 KH, CRG2 ABe).

Such willingness and commitment to uncertainty was a distinguishing feature of design research than many other research traditions within the HCI context and the terminological choices around Probes reflected that. Even when the Probes may be used to gather data for the research process, it was emphasised that the purpose of *“the data that we capture serves to open discussions and it is not the data for the data’s sake that we’re capturing”* (CRG1 ECD: 275-281). While the data from the Probe materials could offer interesting insights by themselves, when used as *“a ticket to talk”* (as Probes are referred to in Chris’ paper) followed by an exit interview, Tom observed that *“these conversations about how they conceptualise these practices is where the interesting stuff comes from”* (CRG4 TJ: 243-248). As a result, this made the Probes process more uncertain in comparison to more structured methods of data-gathering in qualitative research, albeit creative and inventive. However, the methodological ambiguity and the uncertainty of the process seemed to be further amplified when working with Probes in a speculative design manner, which was discussed to be the way the original Probes were used, as well as any ‘designerly’ endeavour of dealing with what doesn’t exist yet, compared to the more data-gathering approaches to Probes:

“I guess there’s something [...] humble and arrogant in being willing to just commit to [...] asking a question through a story or through an artefact and then [...] to really write the story and really make the artefact to actually ask that question.¹⁰⁷ [...] It’s all questions where you don’t know the answer to either, which I feel is different with a lot of other HCI research. A lot of

¹⁰⁷ I think that is a great point, because I feel like framing ‘Probology’ as “an approach that uses Probes to encourage subjective engagement, empathetic interpretation, and a pervasive sense of uncertainty as positive values for design” (Gaver et al., 2004, p. 56) puts more emphasis on the methodological framework Probes are used and Probe returns are analyzed, enhanced by the reference made by combining the words ‘Probe’ and ‘methodology’. However, where there is an underlying speculative narrative of which Probes are only a glimpse of, like Dunne & Raby’s Probes mentioned in their book ‘Design Noir’ (Dunne & Raby, 2001), there’s a strong departure from similar other creative qualitative research methods or applications of Probes that aim for data-gathering in one way or another. The underlying speculative vision may be less explicit depending on the level of deviation from the ‘probable’, but for me, that was a key quality that differentiated Probes as a design-led approach than a creative, qualitative research method that would deal with the world as it is, and this distinction helped shape the course of this PhD research.

research has questions that people start and they're like, 'I know what's going to come out of this'." (CRG3 DO: 383-399)

Where the HCI review processes demanded to locate the use of research artifacts within the existing discourse but design researchers encountered the gatekeeping around similar other design-led terminologies to indicate the use of research artifacts in HCI, adopting the versatile ambiguity around Probes often helped design researchers get through if they are lucky. Heather, who has published extensively on the role of design research artifacts and documentation in RtD, referred to her Probes as "*design research artifacts*" in a straightforward manner in their discussed paper in order to avoid the reviewers' questioning of the semantics and the intent of the artifacts if they were framed as "*Probes*" or "*Probe toolkit*" or "*design Things*" (CRG2 HM: 74-81). She further explained that each of these terms came with their own baggage that was contingent to the reviewer's lens, but not knowing who the anonymous reviewer is in HCI's double-blind peer review processes added a further element of luck¹⁰⁸. While it was found counter-productive "*having to apply a label to it*" instead of being able to focus on describing what's done (CRG1 DL: 306-308), it was as if the concept of Probes were made 'public' through ambiguity over the years for they have been around for longer than these other design-led terminologies to enable getting through the HCI review processes that insisted on doing so. Dan further talked about their previous paper submission on the same project, in which they called their research artifacts 'research products' in reference to Odom et al. (2016), but decided to change it to Probes in the following submissions because they were not entirely satisfied with "*the amount of extra space taken up by justifying the method in a way that is a bit superfluous*" to convince the reviewers (CRG1 DL: 306-321). He further added:

"If reviewers, or if academia has [...] gatekeepers maybe about the particular use of terminology, sometimes it's easier just to adopt a term,

¹⁰⁸ For example, Heather mentioned that despite the informal conversations with her participatory design practicing colleagues on how her artifacts resemble 'design Things' (Bjorgvinsson et al., 2012), she was wary of the issues that would be raised if she was to use the term without necessarily and explicitly naming and justifying her practice participatory design in the way the potential reviewer understands and practices it.

which is so vague like Probes that has been used in so many different applications, that can in general be used to refer to giving people a thing that they do something creatively with that you learn [...] from that something about their lives or the way they do things.” (CRG1 DL: 306-321)

Once a design researcher managed to navigate the ambiguity of the literature on Probes, they indeed cherished and maintained it in order to deal with the dissonance between the uncertainty of the actual design-led research practice and HCI’s unrealistic expectations for transparency around research based on scientific frameworks for research. These expectations for transparency manifested itself in several ways such as the predetermination of knowledge contribution in advance of the process and the demand to label and classify rather unfamiliar approaches to research in order to process the double-blind peer review processes more conveniently. Because it was not always possible to elucidate all these complexities around conducting design-led research in HCI within the material limitations of a paper as the typical HCI publication format, design researchers pragmatically chose to refer to Probes for they were already accepted and well-known while keeping their conceptual ambiguity, as well as the methodological.

6.5.1.3 Following the ways through: Citation as a means of anonymous positioning in HCI

Design researchers shared that they felt obliged to justify any design-led work in HCI, especially if it involved practices and approaches to design-led research that proposed different perspectives to ‘what design can do to know’ that could potentially be perceived as frivolous. Having previously-accepted and published examples that may have been once considered as such counter-narratives mitigated this concern for being taken seriously: “*So it felt like sometimes it took having one thing you could point to say, ‘This does already exist as a thing, we haven’t made this up as a practice’.*” (CRG1 DL: 304-305). Probes were only a canonical example to that for its longer history and wide appropriation in HCI and also, as per the findings of the first study, the semantic qualities of the term.

In order to get reviewed in the right context within the double-blind peer review processes of HCI, materiality references, as well as the terminological, were often made to the previous narratives that are already ‘accepted’ within HCI. Arne, who was located in a computer science department in the German HCI context, explained that working as a design researcher “*in-between*” disciplines resulted in a “*struggle with getting papers into conferences while simultaneously connecting to each other*” within those spaces (CRG2 ABe: 141-143). He exemplified that the egg-shape of their sensor that was mentioned in their paper was indeed a reference to the inspiration derived from the previously-published, hence de-anonymised ‘Datacatcher’ project (Gaver et al., 2016) in order to “*connect to that narrative and [...] the way it would [...] be received in a reviewing and a conference context*”, and that “*second layer*” was indeed missing from the paper (CRG2 ABe: 143-158). In that sense, material and terminological references to previously-accepted examples involved an implicit knowledge of HCI knowledge production and its ongoing disciplinary problems (Beck & Stolterman, 2017) in order to know that they need to be made for the submission to reach the ‘right context’ of peer review in order to ‘get in’. It was almost necessary especially where the design-led work did not fit into HCI’s conventional expectations of research and computational design work. For example, Dan referred to how the analogue nature of the original Probes opened up “*a way of doing things that have [...] not necessarily nothing to do with computers, but are not necessarily actually HCI [...] into an HCI academic domain in a way that people, at least some of the people in that community understand*” (CRG1 DL: 323-336). He further expressed ‘frustration’ about the limitations of having to navigate the fragmented HCI literature to find previously-accepted examples that challenged HCI’s conventional practices in order to justify design-led work in ways that felt arbitrary.

While citing others’ work provided a shortcut means for justifying design-led work and ensuring it reached the right reviewing context for the individual researcher, the collective practices of doing so created new norms around disseminating design-led research in the longer term. This was found to be counter-intuitive to the reason why such citation practices were valued at the

first place as a shortcut means within the material limitations of a HCI research output submission. For example, Eleanor argued that the “*space being taken up in a paper to clarify that a nod to all these opinions that had been made before*” (CRG1 ECD: 242-254) could have been used to focus on more productive aspects of design-led work in research, where Probes provided a great example to this kind of use of citations attracting more use. As a result, the ambiguity around Probes were further increased and new citational norms were created to make these arbitrary connections to previously-accepted examples for justification. Unfortunately, it was likely to impose rather inaccurate evaluation criteria for the future reporting on Probes that could potentially aggravate the existing issues around their decontextualised dissemination:

“you read about things framed in a certain way and then you expect to have to... you see the value that’s been valued, so then you tend to then frame it again like that and maybe you keep missing this big piece of invisible work” (CRG1 ECD: 720-732).

The implicit knowledge of the HCI context and such practices to ‘get in’ was not immediately available to an individual design researcher, unless they were part of a ‘community of practice’ of design researchers that had shared collective experiences in the field. Karey argued that the “*knowledge of also knowing who to cite or how to position the work or also just them being known*” (CRG1 KH: 528-536) was acquired only over time as one advanced in their career and practice as a design researcher or through professional relationships. She further expressed an awareness of “*internal research politics*” (CRG1 KH: 536-551), where design-led research and the dissemination practices could be motivated by personal interests and relationships motivating beyond a mere concern for knowledge contribution in the HCI context, emphasising the ‘invisible colleges’ even within the same community of practice in HCI. Arne further mentioned his own experiences as a researcher from institutions that are less familiar to the field and how “*having a famous name*” brought in the implicit knowledge around the design-led research practices and dissemination in HCI that was previously inaccessible to them and increased the chances of getting in (CRG2 ABe: 385-393). In this

sense, citing previously published and therefore de-anonymised work acted as a means of positioning, but it also signalled one's particular 'research program' within the divergence of design academia and design-led research in HCI to get through the right reviewing context where these crucial details could not be included in the HCI submission for anonymity concerns in the review process and due to its material limitations. Hence, the dissemination and publication practices around Probes were indeed subject to 'interdisciplinary' research politics within HCI, but also the 'internal' politics within design-led research in HCI. These factors were not explicitly included in the research outputs, however influential and involved in the decisions to 'how things became Probes' in the dissemination phase (section 5.5.1). Understanding dissemination practices as a series of decisions made within the research politics of HCI enables an understanding of how Probes are often decontextualised through dissemination rather than lacking legitimacy as it has been debated in HCI.

<p>The concept of 'Cultural Probes' maintains its appeal for the newcomers of design-led research by facilitating a re-orientation of design practices towards knowledge production.</p>	<p>Although initially creating an entry barrier to become a design researcher, the ambiguity of the literature on Probes is valued as one gains experience and competence with design-led research methodologies in HCI.</p>	<p>Working with Probes introduces uncertainty to the research process and may be perceived as a highly risky investment by the industry partners, reviewers, or funding bodies.</p>
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6.5.2 Decontextualisation of Probes through HCI dissemination

6.5.2.1 Losing the sight of the big picture, specifics, and the context of Probes for 'relevance' to HCI

Probes were often colloquially referred to as 'method' both in literature and amongst the interviewees. However, there was a strong objection to treating Probes merely as a qualitative research method. Even when the Probes may be "*still on that edge of communicating insights from a certain community*", Probes needed to be considered as a "*tool for designers*" to gather "*very loose*

input” for “*designerly insight*” rather than “*to communicate research necessarily*” or to make “*a claim [...] about people*” (CRG3 DO: 165-175). Enrique argued that “*the good Probes studies*” “*reflect back*” in their reporting in a similar way to the powerful, relatable narratives to demonstrate and enable further empathy as opposed to ‘methodised’ reporting. He continued to talk about the ‘inspirational’ qualities of these narratives that are not ‘measurable’ nor objective to be translated into practical evaluation and review criteria for Probes and their dissemination:

“I think that’s a different way of relating to data than in a way of proving something through the data and presenting a study that is supposed to relate to your life, because it’s factual. But when we do Probe studies [...] you get the richness of the stories, if you engage with that richness you are able to distil certain kind of insight that then it goes back to your own life experience and rings a bell, so to say.” (CRG3 EE: 742-755)

On the other hand, the paper writing process was said to break these powerful narratives for the sake of relevance in order to fit research outputs into HCI’s ideals of generalisability and applicability in the reviewing criteria. By requiring design researchers to “*break your work into these small slithers and then [...] presenting pieces*”, the coherent narrative behind a design process would be further broken apart and then re-assembled during the anonymous review processes, instead of allowing for seeing the work “*embedded with a complete picture of what the output was*” with less emphasis on “*writing about the method*” (CRG1 ECD: 452-474). Similarly, Dan explained that the double-blind peer review process of the main HCI venues imposed a certain level of “*odd abstraction*” for the sake of relevance to somewhat arbitrarily assigned¹⁰⁹

¹⁰⁹ It’s not entirely random given that expert Associate Chairs (ACs) of the chosen topical sub-committee recruits reviewers based on relevance and there are several steps and at least 4 people involved in a submission review to ensure high-quality. However, because of the large volumes of submissions the ACs need to go through when recruiting, it would not be possible to recruit exact-matching reviewers to the submissions within the divergences of approaches and understandings of design-led research in HCI. Reflecting back on my own experience of being reviewed at CHI 2021 conference for a paper submission on the first interview study I conducted for this PhD research, some of the feedback suggested that some reviewers may have been recruited because of their previous publications reporting on their use of Probes rather than their knowledge of the discourse. While their feedback provided only a specific stance to Probes, it ended up working okay for my submission; however, I can imagine the potential problems if my submission reported on the use of

anonymous “*reviewers who don’t necessarily know that much about the specifics*” and also anyone who may read the submission upon publication, which made it difficult “*to build on someone else’s ideas*”, especially for those who would be more “deeply interested in particular aspects of it” (CRG1 DL: 553-564). While trying to transform the design ‘know-how’ belonging to a particular practitioner would be transformed into an intermediary form of design ‘knowledge’ for the sake of transferability and applicability, the decision-making behind the whole Probe process would be removed from their context, as well as their powerful, relatable narrative. Even though they are “*part of a design process*”, Tom argued that treating such interstitial, intermediary forms of knowledge like Probes as methods or “*as part of the technique*” with a focus on their outputs “*alighted*” the Probe process, including their material production, delivery, knowledge generation, and translation of this knowledge into insights for the design research. He further added that as a result, the whole thing “*sounds and looks like magic*” (CRG4 TJ: 860-865) for making a huge amount of work invisible, if not implicit. This kind of methodised reporting on Probes was said to ironically cause the “*contextlessness*” of Probes when they were “*all about context*” (CRG4 TJ: 441-443).

Moreover, the narrative and context behind Probes and design decisions could sometimes require moving beyond the individual, reflective practitioner narrative in framing design-led research for design work mostly happens in teams. For example, Andy summarised that their collective learnings, interests and agenda as a design research studio was highly influential in the individual decision-making and grounding of a single strand of their work, organised around a coherent ‘research program’ since the team’s earlier work on Probes (CRG2 ABo 160-199). He exemplified how the Datacatcher project (Gaver et al., 2016) led to the TaskCam, and then to the Naturewatch project, and further explained that the latter projects were a result of their collective shift towards “*self-built artifacts*” out of a curiosity to scale up and “*put our designs for*

Probes, where the reviewer had a different approach than mine, due to the issues talked about in section 6.5.1.3.

*research artefacts out into the world for people to make themselves*¹¹⁰ and *“connect to a whole audience of people that have no normal interests in research objects”*¹¹¹, also *“for the regular public to engage with a computational artefact which isn’t driven by commercial agenda of Silicon Valley”*¹¹² (CRG2 ABo 160-199). However, neither the agencies of people and networks of people that took part in the decision-making nor the incidental nature of what Andy described as *“literally like a set of circumstances”* were discussed in the publications at all (CRG2 ABo 160-199). He explained that they *“ha[d] to touch everything very lightly”* because of the material limitations of a paper, but mainly due to the anonymity and relevance concerns in the peer review process, about which he expressed ‘annoyance’ and ‘dissatisfaction’: *“having to kind of tune stuff for the benefit of reviewers, without necessarily always being able to kind of put down exactly what you think”* to *“end up with this quite anodyne and generic account of what we did”* in the paper as opposed to all this ‘big picture’ (CRG2 ABo: 104-112).

When the full narrative behind Probes and design decisions was broken apart, abstracted, and alighted as such, some of the crucial aspects around decision-making and making sense of Probes are made into invisible work and the complexity of the process is over-simplified. For example, Doenja talked about the lack of formalised, steered engagement with Probes may create a sense of failure in the conventional sense or make some work invisible. She explained that although their first participant for the Probe study did not return their responses back to the design team and therefore never made it to the eventual speculative designs that came out of that Probe study, they had a “really big influence” on their material approach and their insights *“still worked*

¹¹⁰ Even though their studio is not explicitly concerned with ‘Participatory Design’, this is very similar to the participatory approach of ‘infrastructuring’, where designers provide the tools and know-how and facilitate for people to design for themselves instead of ‘designing for’ them. However, if they were to use that term in a publication, they would have faced a good deal of semantic and methodological gatekeeping.

¹¹¹ In a way, taking the practice-based design research out of the lab into the field in reference to Koskinen et al.’s (2011) framework for design research through practice.

¹¹² Interesting point that adds to the comparison of industry vs academe in design, especially for computational design. I think it would be interesting to further explore how industry’s commercial agenda manifests itself in industry research, or may create tensions within industry-funded academic research.

itself in", "*just not in the actual data*"¹¹³ (CRG3 DO: 504-513). On a different yet similar note, John talked about Probes insights in comparison to more operational 'research data', and how "*the hard work*" that goes into making sense of the Probe returns and their translation into communicable insights was made invisible (CRG4 JM: 624-631). This would create tensions especially for those that worked with industry stakeholders, who were eager to translate Probe insights into some form of representational model in order to design and launch a product *for* these 'potential users'¹¹⁴, rather than keeping the contextuality of these insights and acknowledging the 'situatedness' of this knowledge (CRG4 SHS, CRG4 JM).

Overall, removing Probes from their own specific research narrative, context and timeline of how they were incorporated into the research process, along with omitting the details regarding the knowledge generation process, would reinforce the methodisation of Probes through dissemination, which is aggravated by the concerns for relevance and anonymity. In the longer term, this would have an impact on the reviewers' demands to what needs to be disseminated. This could go either way: Further methodisation could eventually reduce the generative qualities of the concept as an inspirational resource, or Probes discourse could become more inaccessible to newcomers or disciplinary outsiders as a result of gatekeeping the design know-how around Probes and similar design-led approaches to research in HCI in order to protect them from such 'methodisation'.

¹¹³ This raises questions about how to trace what is considered 'actual' data in design-led research processes, given that a significant part of the participant and material engagements happen in informal, uncontrolled settings in an exploratory and fully-immersive manner as in this example. How do you pin down the phenomenologically blurred boundaries between life/research when working with people or making? Anything can be an insight or inspiration for the design-led research process, is that a good thing or a bad thing?

¹¹⁴ I think this could be where the 'designing with'/'designing for' distinction comes into play. Once the people involved in the 'designing with' process become representations rather than actual people, it becomes a kind of 'designing for' that is driven by the industry's commercial agenda. The industry's tendency for that despite the design researchers' resistance nuances the industry vs academe distinction in the previous footnote.

6.5.2.2 Designerly ways of seeing: The invisible work of probing the knowledge in HCI publications on Probes

Having to fit design-led research in the conventional dissemination formats and standards of HCI created tensions for design researchers working in the field. These tensions were implied in the way design researchers distinguished design work from ‘academic work’ as different aspects of a researcher’s identity (CRG3 BS: 685-689) or as part of the “*designerly struggle of being an academic*” (CRG3 DO: 680-683) almost in a dissociative manner. Enrique explained that having to constantly switch between these distinctly different modes of working can create anxiety:

“it almost feels like when I write about design research, my brain goes into a certain mode, but when I’m designing the brain is in a different mode and [...] my brain is constantly switching in between the designer mode and the reviewer mode trying to figure out how do I negotiate this tension between creativity and criticism and I kind of get a little bit nervous.” (CRG3 EE: 10-20)

However, this duality also assisted a designerly capability for seeing through the decontextualised dissemination of Probes that was supported by one’s own experiences of and proximity to design. Such reporting on Probes was said to require an invisible work of “*almost like probing the knowledge, the whole process is quite a bit randomised and you have to do... it’s a fair amount of energy to tie it all together and build your own*” (CRG1 ECD: 566-568), in parallel to Boehner et al.’s resemblance of Probes to Rorschach test “revealing their uptakers’ perspectives and preoccupations” (2007, p. 1082). As opposed to a merely academic way of seeing publications as vehicles for ‘knowledge transfer’, the ‘designer’ lens allowed the reader to imagine all the invisible work and other crucial details that was made implicit in the publications. This was especially the case for making and using artifacts for research, which were often missing in the reporting on Probes. For example, Heather expressed her own capacity of being able to imagine all the invisible work that went into the material development of research artifacts “*as someone who works in this medium*” despite the “*tiniest narrative*” that was made available in regard to it in the others’ publication (CRG2 HM: 114-121). Similarly, Arne expressed his

designerly ways of seeing the under-articulated design-related aspects of others' publications in his group:

"I think it's very inspirational for me in the sense that because I'm a designer and you are designers as well, your issues are shining through those half sentences." (CRG2 ABe: 404-410)

It was agreed that HCI's failure to understand the contribution of making in general resulted in obscuring the material development of Probes in the reporting, which contributed further to their decontextualisation and thus methodisation. This seemed to make it more difficult to share the transferable aspects of the designerly know-how around making and working with Probes to result in an unintentional form of gatekeeping. While the design researchers who engage in making for their research endeavours believed that *"making deserves its own standing in a paper"* (CRG2 HM: 114-121) *"as a contribution in itself"* (CRG2 HM: 276-286), many expressed a lot of frustration about the difficulties around conveying its value and contribution to non-making audiences within the material limitations of the publication formats. Andy argued that even within the divergent 'designer' communities of HCI, there were some *"who seem to have no interest in making at all"* (CRG2 ABo: 265-274) failing to appreciate the rather 'compelling' aspects and the contribution of making beyond the instrumentalised uses of the final artifact. He further added that as part of their publishing strategies as a team, they have started highlighting the design(ed artifact) itself as one of the explicitly stated contributions in case the reviewers may have such attitude to making (CRG2 ABo: 288-292). This resonated with other design researchers who also chose to include explicit and frequent reminders of their contribution throughout the submissions (CRG2 HM, CRG2 ABo, CRG3 EE). Enrique stated that doing so alleviated the challenges of working within *"very different traditions of what is considered as valuable knowledge"* (CRG3 EE: 130-160), especially where the critical approaches to design-led research would not fit into HCI's predominant research narratives of 'problem-solving' in terms of contribution (Blythe, 2017). Nonetheless, design researchers sometimes chose to leave out crucial details on the exploratory making activities where the reviewers' demands exceeded an explanation of *"how something was made or why you*

made it" (CRG2 HM: 114-121) in order to save space for the eventual outcomes of these explorations. It's not surprising that this exercise to fit into the material limitations of these conventional HCI publication formats also seemed to increase their chances of getting in.

Probing the knowledge in this 'designerly' way was an invisible work itself that is not reported in the publications and was implicit to design researchers or those in proximity to design. Those that have not yet experienced the situated nature of design-led research would not always be able to imagine the under-reported aspects of the Probes when reading the academic publications. For example, Lee (2012) pointed out that design students who have not gained competence in such 'situated design methods' could misinterpret the portability of Probes by trying to replicate them. Similarly, Britta mentioned their students' tendency to methodise Probes by copying rather than drawing inspiration from the original resources. Doenja speculated that it may have arisen from "*that lack of being able to see that work and then being able to do it*"¹¹⁵ (CRG3 DO: 351-353). It was for this reason that having alternative formats to disseminate Probes in more visual ways was particularly important to break such tendencies. However, Doenja's discussed publication was the only pictorial in this study due to the limited availability of such examples leveraging the visual formats to touch upon Probe artifacts and their materiality. Britta referred to their use of Doenja's pictorial in her teaching of Probes to broaden the students' idea of "what Probes could look like" in order to "*get them to think creatively*" about Probes (CRG3 BS: 218-223). Moreover, there was an observed lack of appreciation for the invisible work that goes into the design of the pictorials themselves based on the predominant notion of

¹¹⁵ I think this relates to why design education and work happens in a studio rather than a classroom or an auditorium. These hands-on 'critique' sessions are for reciprocal knowledge and know-how transfer through a master-apprentice relationship between the trainee and the instructor and potentially immersion in a 'community of practice'. This kind of training enables seeing through a publication to imagine the invisible design work that is not always reported around Probes and to interpret its situated knowledge for interpretive adaptations that would fit one's own design-led research context and purposes better, as opposed to understanding Probes as a 'scientific' method, which often works as a recipe or instructions to follow. This difference is important for what I mean by "enacting a paper", and Britta's students, due to their yet-incomplete training, are not enacting it in the way designers are claimed to do.

academic research outputs merely as serving knowledge transfer. This was aggravated by the lack of visual literacy skills in HCI, where Enrique argued that “*all that labour is invisible for the large chunk of the academic community that traditionally publishes papers*¹¹⁶” (CRG3 EE: 299-304). However inclusive the original intentions may be in making such dissemination formats available in HCI, it was not enough to make pictorials a common practice despite their better suitability for presenting the use of Probes in a design-led research.

It was implied that the ill-fitting nature of the HCI dissemination processes that decontextualise and instrumentalise Probes could further widen the existing gap between the ‘designerly’ and ‘academic’ in the longer term. As discussed, the HCI reviewers’ capacity to imagine the invisible work and probe the knowledge in a submission may be already limited if they did not have enough experience with the design-led research processes and having visual formats to illustrate the materiality of designed Probe artifacts and explicit reporting on what has been made implicit about the crucial aspects of the process would alleviate that. Continuing to disseminate Probes in the current ways could potentially subject Probes to under-informed, or unfair evaluation criteria. Even though this was already the case at times, it was considered to be “*the price of entry*” in HCI (CRG2 ABo: 451-459). Once past through and published as de-anonymised, the ‘contextlessness’ of Probes needed to be compensated by the rather ‘knowledgeable’ reader to not just probe the knowledge in a single publication, but also put the publication in the wider context of design research and HCI. That indeed required a degree of proximity to design discourse to be able to historicise publications and terminology. Karey reflected on how terminology, as well as research outputs, have an ongoing life of its own once disseminated:

“So I think these politics with the words that we use, but I also think there’s something with these ongoing conversations and papers and how papers

¹¹⁶ I find this interesting that these details could be how designers have been able to recognise each other in a field that is huge yet fragmented and managed to find ways to collaborate and support each other despite the potential divergences in their approaches to design-led research. It would not be wrong to say that ‘probing the knowledge’ through a ‘designer’ lens also includes being able to read the cues for identity-signaling behavior.

and these stories being shared and packaged in particular ways, the life that they take, that's ongoing, it's not... even some ways it's often positioned as being a final output but it's really not, which I think is also really interesting to the politics of the words we use and how we I think position what we're doing, and I think Probe being a very great example of that.”
(CRG1 KH: 683-688)

In summary, the complexities around disciplinary silos of knowledge production in HCI, combined with the decontextualisation of Probes in the dissemination, required ‘probing the knowledge’ in design publications in HCI. However, proximity to design discourse and know-how was a prerequisite to the capability to historicise publications in such manner, which was not accessible for everyone.¹¹⁷ This was especially the case for Probes in HCI, where crucial ‘design-led’ aspects of Probes were made implicit in the dissemination to focus on their outcomes and fulfill the more traditional expectations for ‘knowledge contribution’. As a result, Probes were methodised despite their emergence as a ‘critique of method’ in HCI in order to challenge the traditional ways of conducting research, as well as the conventional understandings of design at the time.

<p>The methodised dissemination of Probes within HCI frameworks removes them from their specific research narrative & context.</p>	<p>Understanding dissemination as a series of decisions made within the research politics of HCI allows for a more nuanced reading of the publications.</p>
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¹¹⁷ Even for me, as someone who came from a design background into the research context of HCI, I felt that it was difficult to ‘probe the knowledge’ around Probes from the individual publications alone and that there was a need to contextualise Probes and how they are used in design-led research processes within the larger picture of the ongoing legitimisation of design-led knowledge production. This was the main motivation behind the fieldwork of this research.

6.5.3 Alleviating the ‘methodisation’ of Probes in HCI

6.5.3.1 Mitigating the material limitations of HCI publications for design reflexivity

Decontextualising Probes in order to fit the Probe process and its outcomes into HCI’s conventional dissemination formats would reinforce HCI’s preconceptions and expectations around knowledge production through design. For example, design researchers emphasised that the Probe outcomes served ‘designerly’ insights and ‘not the data for data’s sake’; however, their uptake as ‘research data’ was indeed a symptom of methodisation. On the other hand, Tom mentioned that there are very few publications that allowed for “seeing Probe results as Probe results” as in Chris’ discussed paper (Elsden et al., 2016), as opposed to the prevailing narratives around Probes “*as part of the technique*” for qualitative inquiry (CRG4 TJ: 859-864). Chris explained that when publishing some examples to the Probe returns in their paper, they ensured their contextuality by distinguishing the more generalisable from the intermediary contribution in order to avoid the uptake of their Probe outcomes as ‘research data’ in the traditional sense (CRG4 CE: 895-904). Tom further argued that Probes and design workbooks were “*interstitial, intermediary forms that don’t seem to have the same logical progression that you can write about in textual formats*” if one was to write about the “*material development of ideas rather than theoretical ideas*” as part of methodological contribution (CRG4 TJ: 865-870). As opposed to adopting Probes as a way of handling uncertainty at the earlier stages of a design-led process, retrospective reporting on Probes would post-rationalise the process to fit into the conventional publication structures and research narratives.

The interviews made it clear that reflexivity played an important role in decision-making throughout the Probing process although under-reported in the HCI publications due to this incompatibility. Making this reflexivity explicit was a way to contextualise the use of Probe artifacts in a research process. For example, in order to capture “*the reflexivity of the production of the materials to engage with the situation*” (CRG4 TJ: 925-927), Tom suggested

turning to humanities for “*collections of things that can lead to systematic knowledge around how one approaches problems*”; however, he had reservations about “*where does one put it and how does one get credit for it*” (CRG4 TJ: 906-911) within the current HCI dissemination practices. It was acknowledged that the pictorial format aimed to mitigate this incompatibility (CRG2 ABo, CRG3 DO, CRG3 EE, CRG4 TJ, CRG4 CE) and also “*a whole set of issues around publication formats and just not having room for enough pictures and all that sort of stuff*” (CRG4 CE: 843-844). On the other hand, the contextuality of Probes would still pose a challenge in terms of dissemination for the situatedness of design-led research indeed required the reflexivity to go beyond the individual’s practitioner’s ‘reflective conversation with the situation’ in order to mitigate the ‘contextlessness’ of Probes. Chris argued that this is “*addressed somewhat by people putting in more reflective commentaries of, ‘We are a set of researchers from this time and place with this background and that’s flavouring how we do this research’*”; however, he further added that these reflective commentaries helping “*set up*” would often get ‘cut out’ due to page limits as they were not considered to be part of the knowledge contribution in HCI (CRG4 CE: 913-923). Pictorial format was valued for not prescribing a linear progression for the overall research narrative and allowing for more visual and open-ended ways of conveying the process and materiality of Probe artifacts. Doenja, whose publication was the only pictorial in the study, further emphasised the importance of having such alternative formats available for times when a picture may be worth a thousand words in dissemination as “*the only way*” (CRG3 DO: 272-277). Having more visual images in the publications on Probes were important for the reader, too, especially if they were looking at from a designer perspective. For example, Andy mentioned how he was “*really drawn to all those images*” in Heather’s paper, compelled to “*see more of that materiality there*”, but acknowledged the difficulty of finding alternative formats to communicate such (CRG2 ABo: 271-274). Similarly, Enrique mentioned that he wanted to see more of Doenja’s Probe artifacts when reading her pictorial, having put his ‘designer’ glasses on as opposed to the ‘reviewer’ one to get inspiration for his own design endeavours (CRG3 EE: 153-155).

In summary, HCI's imposition of 'scientific' knowledge production through its structures was aggravated by the material limitations to disseminating design-led research in conventional ways. Where the reflexivity and context behind the material development of the Probe artifacts were excluded from the reporting, the artificial and subjective construction of 'design problem' was post-rationalised to make it fit into the linear progression of narrative in a typical HCI paper. While there were more visual and non-linear alternatives to the paper format like the pictorial one, they were inconvenient for design researchers striving to get into these more prestigious domains of knowledge production in ways that will be explained later. As a result, the paper format was still preferred over the others despite its unsuitability for disseminating the outcomes of a design-led research, reinforcing the methodisation of Probes and certain narratives in the reporting.

6.5.3.2 Probes as journey: Going beyond HCI's prevailing narratives of 'efficiency'

Even where the material limitations for disseminating Probes would be overcome, HCI's underlying 'efficiency' rhetoric would continue to pose challenges when making the reflexivity explicit. It has been argued that the prevailing narratives of efficiency and utility stem from the industry orientation of HCI research¹¹⁸ (Löwgren, 2013). The industry orientation was also implied in the framing of theory-practice gap as a problem to overcome for re-positioning the research field closer to the industry practices (Beck & Ekbia, 2018). Andy argued that despite its stronger sense of research community, CHI maintained to "*worship the altar of efficiency of Silicon Valley*" based on the observation that the conference presentations only shared success stories behind "*a very polished outcome*" rather than using such opportunity to genuinely exchange learnings and experiences around the actuality of practice. As a designer-practitioner-researcher, he was further distrustful about the applicability of "*five very clean takeaways*" offered as part of the

¹¹⁸ Löwgren (2013) actually criticises HCI's willingness to over-simplify 'theory' in order to stay relevant to the industry practices. He argues that such attempts to expand the "scope of applicability" should not be mistaken for the abstraction of the particular artifacts to generate intermediate-level knowledge towards building theory.

'classic CHI presentation style' to lead future work, expressing that he could never conceptualise his learnings in this manner (CRG2 ABo: 353-365). Indeed, it has been argued that CHI's 'engineering legacy' disregarded the key aspects of design praxis that ensured a different kind of rigor in design-led research than the scientific traditions of HCI, such as the non-linearity of the process (Wolf et al., 2006). As a result, this 'efficiency' rhetoric would often manifest itself as problem-solving in the research narratives in HCI (Blythe, 2017), sometimes going too far to create artificial problems for justification (Blythe et al., 2016). Andy argued that such dissemination practices potentially put more emphasis on the narrative than the merit of the work as "*a way of guaranteeing that something's accepted no matter what your process is or what you've made*" (CRG2 ABo: 369-372). On the other hand, it was agreed that the 'five very clean takeaways' were effective in terms of conveying the contribution due to HCI's unwillingness to 'probe the knowledge'. Arne admitted that adopting this CHI paper narrative and "*leaving nothing open*" increased his chances of getting in (CRG2 ABe: 374-376), further expressing the intellectual tensions of an individual design researcher wanting to get published.

Individual design researchers' compliance with the formulaic narratives of CHI and the underlying 'efficiency' rhetoric of HCI in order to get published would create further discrepancy in the dissemination of Probes in the long run. As a result of such trade-off, the HCI ideals of efficiency, generalisability, applicability, scalability, and transferability would be reinforced in the long run, as well as convoluting the narratives around Probes in the literature. Tom mentioned that such narratives allow for only the "*successful Probes*" to be presented in the publications, as a result reducing, if not completely discounting "*the insane complexity of doing it well and doing it right*" (CRG4 TJ: 647-656). Despite what the narratives of dissemination may suggest, in reality, Probes were seen as "*the scenic route*" for their lack of care for efficiency and even purpose, and for their "*need for exploration*", coming from the design researcher's "*position of wanting to learn, of wanting to understand*" (CRG3 BS: 440-446). The uncertainty in design was seen to be in direct

contrast to these ideals of 'efficiency' and created further tensions when working with Probes in HCI.

Having more of the 'failure' stories was suggested as a way out of the prevailing narratives of 'efficiency' that impact the dissemination of Probes, as well as other aspects of exploratory design-led research practices. While it was normalised that "*success stories are easier to write*" (CRG3 DO: 492-493), the value of 'failure' stories with Probes was acknowledged despite the lesser motivation to do so. For example, John pointed out that "*the thinking that you would've gone through in order to create those Probes that were never deployed, there's value over here somewhere and maybe impossible to articulate it.*" (CRG4 JM: 660-662). Tom elaborated on this value for its rewarding qualities as "*a filter mechanism*" (CRG4 TJ: 716-719) for the material development of ideas when designing the Probe artifacts. Such 'failure' stories to further unpack the existing accounts of Probes would also help recognise the invisible work of "*months and months and months working on that one thing like it was nothing, almost*" (CRG2 HM: 294-295). It was suggested to look up the few 'successful' examples to 'failure' stories in HCI. For example, Britta talked about a 'failed' case study for monitoring technology for people with dementia, where the researchers decided to quit the study after a day and wrote a paper about "*the motivation as to why they couldn't be bothered*" (CRG3 BS: 495-500). Similarly, Doenja mentioned the literature on 'non-use' and suggested 'non-engagement' as an alternative subject to explore with the Probes (CRG3 DO: 476-480). It was implied that 'failure' stories could be 'repackaged' to fit into the prevailing narratives of HCI as a future direction for revisiting previous work; however with caution to the emphasis on the outcomes of design-led research with the implications of 'failure'.

When design-led research is considered as a process of learnings throughout rather than mere valuation of its results, understanding the reasons why things 'fail' was more insightful than the results they would have yielded if successful. This was also how design researchers tended to think about Probes, which did not fit into binary and reductionist evaluation criteria of success/failure

based merely on the outcomes of the Probe artifacts. For example, Tom talked about how his 'failed' and previously unreported Probes "*ended up working okay in a workshop*" (CRG4 TJ: 696-708). This was because the workshop setting helped contextualise the use of Probe artifacts in the process of participant engagement rather than treating them as a 'method' that would succeed or fail in engaging participants and yielding insights. He concluded that reporting on the use of Probes for a workshop is "*actually a very reasonable translation*" (CRG4 TJ: 641-656) in contrast to the predominantly 'methodised' reporting on the instrumental uses of Probe artifacts that imply such reductionist evaluation criteria. Moreover, the success of Probes in a design-led research process depended on many factors beyond the artifacts' or design researchers' ability to engage participants, even in a workshop setting. John argued that such reporting may maintain the focus on "*the object and the interactions with it*", lacking the full picture of all the innovation journeys and processes in terms of the agencies of people and networks involved (CRG4 JM: 872-878). The contingency of design-led research processes was also emphasised by Andy when talking about how their Naturewatch project came to be (CRG2 ABo: 177-198). How things come to be, acquire meaning and definitions throughout these journeys were particularly important to *things becoming Probes* (section 5.5.1). John explained how these played an important role in the decision-making throughout the Probe process beyond the artifacts and participants, which was not articulated in the eventual narrative that got published:

"So for us on NewsThings, you can take it from our ends users and the designers and the objects to people like me who are leading the project to my university's intellectual property department who signed this off early on because I couldn't have done any of it had I not had them signing off. Equally our ethics committee, I had to articulate what these things [Probes] could be in order for them to begin to happen, and I couldn't deviate from that too far despite what the users might tell me. I think there's a really complex picture." (CRG4 JM: 878-883)

In many ways, the researcher's agency to argue for the use of Probes when convincing the involved bodies¹¹⁹ to invest in the uncertainty of the process played a role as important as the know-how around the making of Probe artifacts and their intrinsic value for participant engagement in making them 'succeed'. Being aware that HCI would continue to be unreceptive to such counter-narratives as paper submissions, Heather suggested tracks or workshops at more design-oriented HCI conferences like DIS where researchers could share authentic accounts of "*everything that you'd made that had failed*" (CRG2 HM: 323-327), including this kind of contextual reasons to their 'failure' such as lacking funding or equipment. However, Karey brought up her reservations about talking about 'failure', emphasising the 'researcher agency' in being able to do so. She pointed out to her lack of 'authority' as a PhD student in comparison to a more senior or better-known researcher in the field for being given the opportunity to talk about 'failure', because even where the submission and review processes may be all anonymous, doing so would require a "*knowledge of also knowing who to cite or how to position the work or also just them being known*" (CRG1 KH: 523-536). Furthermore, revisiting previous work that is already known to the community to further unpack the processes would also conflict with the anonymisation in the double-blind peer review processes of HCI.

Overall, it was agreed that such counter-narratives could make visible the 'invisible work' of making the Probe artifacts and the full picture of human and non-human agencies involved in a design-led research. It would further encourage putting in the extra effort to 'probe the knowledge' in HCI publications on Probes and design in general, as opposed to 'methodisation'. However, this required collective action in HCI rather than individual efforts by design researchers. Heather questioned if such efforts are 'valued enough', where there are limitations to resources and a constant pressure to be productive in academe, further adding that "*and then you get to a new study and you design something new, and it all starts again*" (CRG2 HM: 437-443). Therefore, it was understood why design researchers would sometimes

¹¹⁹ Here, I refer both to the people and the organisations by the use of 'body'.

participate in the ‘methodisation’ of Probes in HCI through their adoption of conventional dissemination practices. Individual action was possible only if there were shared practices and resources around Probes, as will be discussed in the following section.

6.5.3.3 Unblackboxing design-led research: Creating Probe resources

Despite their regular appearance in HCI literature as a conceptual term for design research artifacts, there are no shared archival practices around Probe materials themselves. It was mentioned earlier that Probes appear only rarely in the publications bypassing the entire process behind them ‘as part of the technique’ for ‘efficiency’ within the prevailing narratives of HCI that focus only on their outcomes. As a result, the ambiguity surrounding Probes were enhanced, making it intimidating to get started with Probes for ‘newcomers’ unless they have access to the know-how around Probes through their networks, potentially gatekeeping this design know-how.

Such ‘methodised’ reporting on Probes would also have long-term repercussions on the reception and evaluation of Probes for those that are not familiar with or in proximity to design in order to ‘probe the knowledge’ in the decontextualised publications. It was suggested that having an archival database for Probe artifacts with annotated design decisions would emphasise their designed nature and make the reflexivity behind their material production more explicit towards re-contextualising them. For example, Britta mentioned earlier that examples to “*what Probes could look like*” (CRG3 BS: 218-223) even in a pictorial like Doenja’s helped teaching and encouraging more imaginative uses of Probes with ‘newcomers’. Similarly, such archive would help with communicating the value of working with Probes to industry partners and stakeholders, especially where they may have differing expectations around investing in the uncertainty or the outcomes of design-led research. For example, John mentioned that their stakeholders were apprehensive about the utility of Probes throughout the process, for they may not necessarily lead to an end product or a potential user profile or even claims to knowledge as ‘research data’. Likewise, the ambiguity of the literature around what they

were or even what they looked like made it difficult for design researchers to explain and justify their use of Probes until they were able to show them a *“picture [...] of the cultural Probe [return] to be able to articulate what this is”* (CRG4 JM: 883-893). Eventually, the Probes were appreciated for their *“potential to embrace new learning”* after the project ended (CRG4 JM: 624-631). Having such resources on Probes would help reluctant stakeholders to see the added value by design-led research practices to these collaborations, saving design researchers from the invisible work of managing doubts and expectations and improving the reputation of design research outside academe to foster further alliances.

However, design researchers were wary of the implications of shared archival practices around Probe artifacts despite the potential benefits. Susanne highlighted that engaging with the Probe artifacts *“without any person watching them”* created a sense of privacy for the participants, which resulted in *“much more information, much deeper information”* that could be difficult and even too emotional for participants to talk about in the exit interviews (CRG4 SHS: 375-385). There were some ethical concerns around the *“potential depth”* of the emotional impact of leaving the Probes behind with the participants *“left alone to go through this process”* (CRG4 JM:344-352), which could be of particular importance for sensitive contexts and subjects. Often times, Probe activities would trigger negative feelings in participants that may be challenging for both the participant and the researcher, as well as the positive and constructive reflections (CRG4 SHS: 336-342; CRG4 SHS: 354-357). Compared to an interview study, where the researcher could *“very quickly manoeuvre around a difficult ethical subject”* to ensure a degree of control over the situation for participant safety, the inability to fully construct a participant journey with Probes and their *“deliberately exploratory”* nature created *“unpredictability”*, making them *“tricky”* for both parties indeed (CRG4 CE: 361-373). However, it was such risk taken by the design researcher that created a sense of intimacy and trust between them. On that note, Chris had reservations if having an anonymised Probe database with supplementary materials and ‘raw’ participant responses *“breaks the intimacy”* by opening up a private conversation to *“the rest of the world”*. Even where the participants’

permission was ensured, this could have an impact on how the participants engaged with them as further explained by Chris:

“there is an intimacy to probes that makes them sometimes difficult to publish as a raw form in the way that interviews and interview data is... even quite sensitive quotes, it’s different from a picture of someone’s living room in a way, it’s somehow less revealing, I don’t know.” (CRG4 CE: 839-857)

Such emotion work was only an aspect of the invisible work by the participants that get lost in instrumentalising Probes in the reporting. Design researchers discussed if archival practices around Probes could help acknowledge the participants’ otherwise invisible work and intentions to participate in the more demanding process of Probes in comparison to a survey or an interview study. This was especially important where Probes may become a ‘burden’ on the participants, or demand their ‘creative performance’ and expertise. For example, Susanne’s team had difficulty in finding informal caregivers to engage in the Probes process who were already busy and “*so stressed in their situation normal time*”, yet they still took the time because “*they wanted to give the experience so that future informal caregivers can benefit from that*” (CRG4 SHS: 321-323). In some other cases, Probes were rather a physical burden for “*designing someone’s house or domestic environment for a while*” (CRG3 EE: 618-638) in ways that could be considered ‘intrusive’ and ‘arrogant’ (CRG3 BS: 644-645). Enrique emphasised the ‘creative performance’ aspect of co-speculating with carefully curated participants (CRG3 EE: 524-533; CRG3 EE: 574-584), which indeed contrasted with the ideals of ‘generalisability’ in sampling and recruitment strategies of traditionally scientific research. Doenja added that it was particularly important for their speculative design research that they attracted the kind of ‘creatively performing’ participants through creativity in their call for participation and “*transparency in recruitment*” (CRG3 DO: 535-542). No matter what their motivations to participate in the Probe studies, ranging from wanting to “*promote their lifestyle*” in an activist-like manner (CRG3 DO: 586-592) to just wanting to talk about what they felt strongly about (CRG3 BS: 599-616), it was important that Probes were designed flexible enough not to “*create that sensation that users are not giving their time when they are expected to*” (CRG4 JM: 281-291) or make them feel

obliged to engage in the process for “*they think that you might want to hear for a degree of utility*” (CRG4 JM: 777-787), which all pointed out to their invisible work for Probes. As a result, design researchers were often compelled to design their Probe artifacts with a lot of care, “*assuming a degree of responsibility*” (CRG3 EE: 618-638) as “*a matter of respect for the people that you’re working with*” (CRG4 DO: 640-642). In this way, Probes were considered to be an invitation to participate in the research process; however, within the current dissemination practices, the participants’ contribution would “*very quickly become research data*” regardless of the approach to using Probes (CRG4 CE: 225-241), rendering their work invisible. Karey reflected on her struggle of “*not wanting to speak on behalf of*” her participants as such, especially due to the autoethnographic nature of her work blurring the boundaries of ‘consent’ (CRG1 KH: 413-425). There were some other approaches to acknowledging the participant contribution, where it would get lost in the dissemination because of blackboxing Probes. For example, Jeanette chose to credit her participants for sharing their expertise on the topic and input to co-designing the research process by co-authoring a book chapter with them, as well as keeping them informed on the project and the updates from the field (CRG1 JB: 58-94). Despite being a form of invisible work for the design researcher, such approaches to dissemination was valued for acknowledging the participant agency in the process beyond their contribution to the Probe artifacts even where they are archived. This resonated with Dan, who reflected on how Probes themselves can also augment the participant agency:

“what can you do, what can you create that actually gives people something that they’ve wanted to understand more about their own lives or about themselves that is at least as valuable for them as it is from an external research point of view. [...] it’s the chance for people to be heard, but then you’re still a test subject in some ways [...] can the Probe itself create value for people rather than solely extracting it, might be quite interesting.” (CRG1 DL: 620-642)

Moreover, from a design research perspective, shared archival practices around Probes can open up new ways of how HCI understands and evaluates design research by leveraging the longevity of Probes and their supplementary

resources. Chris mentioned how Probes were often continued “*to be used by participants, [...] have this currency in research projects, [...] turn into another set of resources*” (CRG4 CE: 633-639), where archiving could help re-use them as collective resources that could be especially helpful for ‘newcomers’ and further extend their afterlife. Moreover, Dan had mentioned earlier that Probes opened up a non-computational way of doing things in HCI with their analogue nature (CRG1 DL: 328-335). However, instead of taking it for granted as a norm, exploring why and how that works and contributes to the digital interaction design can mitigate their methodisation as such and help find new approaches to Probes such as “*natively digital*” ones (CRG4 CE: 721-730), especially when working with the digital native generations where physicality of the Probe artifacts may have less impact. Nonetheless, design researchers appreciated the analogue nature of Probes for the ‘defamiliarisation’ of the digital (CRG4 JM: 732-752; CRG4 CE: 754-758), as well as the physical space they take up as a reminder for participants to engage with them (CRG4 CE: 764-769). Furthermore, meta-analysis of Probe returns may create an opportunity to understand why some Probes work and some doesn’t (CRG4 JM: 281-291) or to explore the complexity, richness, and diversity of reasons to why and how people engage with the Probes, especially where Probes are used in ‘staged’ workshop settings like Chris’ use of dating profiles as Probes in the ‘metadating’ event (CRG4 CE: 225-241; CRG4 JM: 486-503).

Even where the privacy concerns are overcome, the contextuality of Probe outcomes would continue to pose a challenge in archiving them. John acknowledged the “*slightly different heritage*” of Probes as such and emphasised their ‘situated knowledge’ “*exists in a very specific time in a very specific place with very specific people within the context of a project and the research questions and the resource*” (CRG4 JM: 883-893). Yet, archiving Probes could accentuate that and reduce HCI’s tendency to methodise Probes through instrumental reporting. By illustrating the complexity to the design-led research processes, an archive for Probes would help develop more suitable evaluation criteria for Probes in the long run as opposed to the dichotomous evaluation criteria of success/failure for Probes within the prevailing ‘efficiency’

narratives of HCI. Although there was no agreement to how to evaluate Probes, it was agreed that the rule of thumb for distinguishing a bad Probe would be “*one that’s really uninspired*”, copying the original cultural Probes without giving much critical thought to why and how’s of using Probes (CRG3 BS: 214-218), and therefore contributing to the ‘methodisation’ of Probes. Furthermore, an archive would emphasise the ‘designerly’ aspects of Probes as opposed to data-gathering, for their actual ‘success’ lied in the capability to facilitate speculation by inviting participants to resist or comply with the gentle provocations materialised in the Probe artifacts (CRG3 DO: 448-455). In the long run, shared archival practices around Probes would help ‘unblackbox’ the design-led research processes and further help setting more realistic expectations from design-led research rather than limiting it to its capability for problem-solving in a similar way to the mere ‘data-gathering’ uses of Probes.

Summarily, creation of an archival practice for Probe materials would emphasise the designed nature of Probes to alleviate their methodisation, but also acknowledge the invisible work that goes into their ‘knowledge contribution’ both by the research team and the participants. It could open up new aspects of Probes for further inquiry and demystify the design-led process behind them to encourage HCI ‘newcomers’ and disciplinary outsiders as part of fostering a culture of design and design research in academe.

<p>The material limitations of HCI dissemination frameworks can be mitigated by exploring alternative formats & narratives that are more suitable for the non-linear progression of design-led research.</p>	<p>Creating shared archival practices around Probes can emphasise their contextuality and make visible the invisible work that goes into working with designed artifacts as part of design-led research.</p>
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6.5.4 Fostering a culture of design and design research in academe

6.5.4.1 Overcoming biases and institutional constraints working against the ‘designerly’

As discussed in detail in Chapter 2, research has been ‘owned’ by the sciences, resulting in the ‘scientific’ notions of academic research that has kept design at bay as a ‘disciplinary outsider’. With academia becoming more inclusive to expanding the concept and definition of research onto ‘other’ research came the latter entrance of design research and even latter entrance of its more practice-based forms¹²⁰ into the domain of higher education. Furthermore, the challenged authority of traditional modes of knowledge production within the changing context of wider academia (Nowotny et al., 2003) commenced more ‘humanised’ and socially accountable understandings of ‘research’ and ‘expertise’. While these developments could have potentially created an ideal environment for the delayed flourishing of design research, in practice, the scepticism around the autonomy and legitimacy of these ‘novice’ domains persisted (Borgdorff, 2012). Aggravated by the uncertainty in design processes, this scepticism deepened the ‘newcomer’ anxieties, especially for the design researchers transitioning from being a designer with little research training into academic researchers. It was discussed earlier that the popularity of Probes particularly amongst ‘newcomers’ was almost like a ‘rite of passage’ in becoming a design researcher, potentially because the semantic qualities of Probes (section 5.5.1) helped mitigate the concerns for being taken seriously and fostered design researchers in their becoming. Karey, who was a designer prior to becoming a design researcher in HCI, explained:

“early on when I started my PhD the advice I was given was, ‘If you’re writing for CHI it’s really good instead of saying you’re exploring something, say you’re investigating it’, there’s a big difference in terms of how that is taken seriously in a certain extent in regards to design, and this word ‘Probe’ to

¹²⁰ Or “design-led research” as I chose to refer to as an umbrella term to include different disciplinary approaches to design. The terminological choices I made was explained in section 1.3.

me carries in some ways that same weight of an investigation, investigation of ambiguity versus just exploring what I don't know.” (CRG1 KH: 378-383)

Being a relatively new research domain that extends from the market-oriented professional practices onto academia, the reception of Probes revealed the intrinsic and extrinsic biases around how design is perceived and the roles attributed to it both within and outside academia. Despite the contrived distinctions between the notions of design and research, the ‘designerly’ skills could be indeed channelled into research towards knowledge production purposes. For example, Enrique referred to how Dunne & Raby’s critical design work confronting the bias around the attributed purposes to design “*to sell*”, “*to buy*”, and “*to beautify*” motivated his Probes in his questioning “*from a designer perspective of can I design to know*” throughout his transitioning into a researcher from a designer (CRG3 EE: 32-37). However, because of these biases, design-led research practices were either embraced with enthusiasm and at times unrealistic expectations or received with apprehension and even hostility in a wide range of contexts, not only in HCI. For example, even though design-led research would often entail the production of artifacts, they would be meaningful only as a response to a particular situation (Löwgren, 2013); however, the industry partners would generally remain conservative in their expectations from design-led research practices. In John’s case, the initial ‘exotic’ allure of Probes towards research and innovation would soon be found “*really provocative for the industry partner*” even when not working within a market-oriented paradigm, creating “*another layer of tension that the Probe catalysed even though itself didn’t manifest*” (CRG4 JM: 557-582). Similarly, Susanne recalled their experience of having to convince the industry partners regarding the ‘utility’ of Probes, for their outcomes were not easily translated into a conventional design outcome or use scenario as a return to their investment (CRG4 SHS: 354-357). On the other hand, the academic liberation from the industry constraints and market demands would provide academic designers a privilege “*to go beyond the establishment of design*” of ‘problem-solving’ according to Enrique, who further reflected “*that might be a reason why we always veer into the speculative, because we can*” (CRG3 EE: 401-413), for which Probes were often used. If

this was not an underlying mission to expand the scope of design research through practice, the ‘utility’ and ‘relevance’ of such design-led research practices would continue to be further questioned in the larger context of design. This would be especially apparent within the heterogeneity of approaches to design-led research in HCI, where the concern for closing the theory-practice gap seemed to outweigh that for the advancement of design as a research discipline. Britta referred to this as “*the same kind of problem [of how design is perceived] or the same communication barrier [...] that we are facing sometimes when we’re talking about design and speculation and all of this with people who might be interested in the best case, hostile in the worst*” (CRG3 BS: 355-363). Enrique further added that hostility could sometimes take more covert forms like ‘dismissal’ and eventually discourage the good intentions and efforts to create mutual understanding in such situations of disciplinary segregation (CRG3 EE: 365-367). Doenja reflected on her similar experiences as “*the struggle of convincing computer scientists*” about the ‘credibility’ of Probes and the ‘sufficiency’ of design-led research in spite of their decades-long history in HCI (CRG3 DO: 757-760). With all these examples suggesting a lack of design research culture both within and outside academia due to its relatively ‘novice’ position, design researchers would continue to confront implicit biases stemming from narrower understandings of design and the disciplinary silos of knowledge production in HCI despite the claims to interdisciplinary.

As a result of this lack of collective design research culture in academia, individual design researchers were often burdened by defending design-led research at their institutions despite their seemingly privileged position. In line with Borgdorff’s claim that “the burden of proof always rests with the ‘novices’, whereas the legitimacy of mainstream academic research is seldom fundamentally challenged” (2012, p. 54), design researchers were often subject to scrutiny. Furthermore, an inter-discipline by nature¹²¹, design’s

¹²¹ Although design is often and colloquially referred to as an ‘inter-discipline’, we have indeed moved from a discipline-based understanding of design to more nuanced understandings like an ‘in-discipline’ (Gentes, 2017), ‘alter-discipline’ (Rodgers & Bremner,

flexibility often allowed design researchers to be integrated into a heterogeneity of existing institutional structures where relevant design-led research takes place, which was also illustrated across the different departmental configurations to where design researchers participating in this study are located. However, this ‘add-on’ configurability created a strong sense of ‘in-betweenness’ that was considered to be both a blessing and a curse by design researchers, sometimes enduring throughout one’s career. For example, Arne talked about “*the hoops [he] had to jump through*” when applying for professorship in Germany, where he had to justify his ‘in-between’ position within the clearly demarcated disciplines and research practices in the German HCI context (CRG2 ABe: 137-145). Similarly, Britta explained that they “*often felt like the only designer*” at the school of computer science where they did their PhD, having had to do “*a lot of heavylifting*” to defend design-led approaches to research, as well as their own. They explained any approach that aimed to “*bring some of the ethos of design [...], taking this leap of faith [...] into the work you’re doing, giving up a bit of control that you’re having, being able to be critical of your own work potentially*” (CRG3 BS: 201-215) was positioned along with the ‘designerly’ in opposition to the computer science approaches within the dichotomous camps of HCI. Acknowledging the fragmented nature of knowledge production in HCI (Grudin, 2006) and disciplinary segregation as such, they recalled their own experiences of trying to “*bridge the gap between the two*” for mutual benefit but finding themselves to be in the ‘novice’ position that needed to adjust and adapt to the existing structures:

people who do computer science are not designer, nor do they want to be. So how do we [...] explain to them what it is that we’re doing without watering down the tools that we have been building up?” (CRG3 BS: 201-215)

On the other hand, for design researchers located at a design school to have more freedom to push the existing understandings of design in their

2019), and most recently as ‘nomadic practices’ (Wakkary, 2020; Wakkary, 2021) in reference to posthumanist phenomenology, situated knowledge, and nomadism.

approaches to research, the conflict of the faculties became only apparent outside their usual setting; however more antagonistic for diverging too much from HCI's understandings around design. For example, as a designer-practitioner-researcher, Andy described how his work "*happens to be working this really odd context which crosses over into HCI*" (CRG2 ABo: 123-124). He was rather privileged to be working at a design school with a research group of like-minded researchers unlike Britta, Enrique, and Arne, who openly talked about their experiences of 'everyday hostility' in the forms of dismissal, scrutiny, condescension and mutual exclusion for they were located in departments with a fundamentally different approach to research than design. Nonetheless, Andy recalled his experiences of hostility in the form of not being welcomed even within the different design communities in HCI. He mentioned that despite the claims that "[CHI] *community has embraced design for so many years*", he had experiences where people "*seem to fall on deaf ears*", especially around 'designerly' things that fall outside these understandings and expectations around design in HCI that pre-existed design's disciplinarity (CRG2 ABo: 265-271). In fact, research that is openly challenging those could result in more overt displays of hostility despite having proven its merit through peer review processes. Andy talked about their experience of presenting work at a past HCI conference, where they challenged the textual formats to "*make it much more picture-based*" in order to explain the process of making:

"It kind of sneaked through into the conference but it got absolutely hammered and slaughtered during the presentation, the questioning was really harsh. People were saying things like, 'Okay, so what's the difference between what you've shown me and a drawing that my five year old child has given me?' [...] I guess they don't see the point of it, perhaps. Or perhaps that's an issue about how it is very difficult to articulate that to a non-making audience." (CRG2 ABo: 123-135)

These tensions arising from the understandings and biases against design preceding its 'novice' position in academia were indeed not unique to working within HCI, they often further created institutional constraints within the broader context of academia. Similar to Enrique and others' conceptualisation of different modes of working in design-led research mentioned earlier, Arne brought up his differing interests from design-led research as a researcher and

a designer. The 'critique of the existing' emphasised in the broader definitions of design (Simon, 1996) was implied in the way he expressed "*the obligation to tell counter-stories*", for example to challenge the "*efficiency brigade*" within the German HCI community and the CHI contexts where efficiency is the norm, while keeping his willingness to understand the 'other' perspective (CRG2 ABe: 253-259). However, such research would continue to be evaluated based on its utility by the higher authorities (Strathern, 2005), meaning that it would potentially end up being attributed with lesser value against its more 'efficient' counterpart. Arne acknowledged this as the main challenge for more critical approaches to design-led research and their positioning in academe, especially for their lesser concern for utility and efficiency in regard to the riskier use of public resources, stating "*a mismatch between what we can talk about right now*" and "*what we report outside*" (CRG2 ABe: 259-263). While the 'designerly' ways of conducting research transformed design-led research to involve a higher degree of material experimentation, criticality and speculation, these factors created a higher degree of uncertainty for its inability to anticipate the 'utility' of these outcomes in advance, making this kind of 'designerly' research a riskier investment from the government perspective in terms of funding. On this note, Arne mentioned the strategical adoption of the 'efficiency' narratives when reporting to the higher authorities in order to avoid the shrinkage of funding and resources for managing the duality of design-led research. Similarly, Andy expressed annoyance at having to repackage previous work in these 'efficiency' narratives for REF (Research Excellence Framework) submissions in the UK, where every academic department undergoes a nation-wide assessment based on the collection of their research outputs every eight years without an acknowledgment to the differences in approaches to research. He further articulated the intellectual tensions arising from the contrast between what these narratives suggest and the actuality of practice in terms of how designerly learnings may continue even after a project ends (CRG2 ABo: 214-225). While the invisible work of having to justify and defend research for REF and other institutional, academic obligations is not unique to design, for similar issues emerge within the broader context of practice-based research, arts and humanities research, these issues are often amplified for design-led research: Design research increasingly lacks a fixed

and collective identity to be defined as a ‘discipline’, especially in its practice-based forms that are often appropriated by other disciplines as in the example of RtD in HCI. Hence, it becomes harder to propose a collectively-accepted framework for the assessment of design-led research as an alternative to the existing science-based frameworks created prior to the academisation of design and their improper evaluation of design-led research based on utility and propagation of the ‘efficiency’ narratives. First and foremost, this would require fostering a culture of ‘design research’ in academe, nuancing the plurality of design-led research practices rather than putting them all in the same basket.

6.5.4.2 Alternative formats and processes for disseminating design research

The plurality of ‘design researcher’ identities and the increasing complexity and divergence to the contexts of design-led research was observed across the participants, each bringing their own approach to design-led research in HCI. As a result, the notion of ‘knowledge contribution’ in design-led research may not always conform to what HCI considers as contribution (Wobbrock & Kientz, 2016). Hence, the design subcommittee of CHI aims to embrace these ‘designerly’ contributions to HCI¹²², which often take other but equally valuable forms than ‘facts’ (Gaver & Höök, 2017b). They may include the learnings throughout the process of making rather than the mere focus on its outcomes as the ‘artifact contributions’ suggest, as emphasised by Andy in particular. Furthermore, they may include equally valuable learnings from the processes of fostering empathy that is crucial to the design processes for most design work involves working with people and designing experiences for them. For example, Tom mentioned that trying out their own Probes as the research team was particularly important when working in the context of an emerging science and bodily sensation for the artifacts provided a “*multifaceted*

¹²² For example, on the ACM website for CHI 2021, the “designerly contribution” is emphasised in the description of design subcommittee for the selection of subcommittees to submit for. The design subcommittee further encourages contributions that “broaden the boundaries of interaction design” or addressing “design research issues”. Check <https://chi2021.acm.org/for-authors/presenting/papers/selecting-a-subcommittee#Design>

perspective on something that you can possibly feel directly but also needs some sort of mediation to understand what it is" (CRG4 TJ: 538-555) as part of their methodological contribution. However, because these other, supplementary kinds of contribution would not be 'compelling' to the anonymous reviewers, they would often get excluded from the submissions, as in Tom's case. It has been acknowledged that design's expansion may not necessarily fit within the material limitations to what makes a good CHI design paper (Gaver & Höök, 2017a), but it would not fit into academe's established expectations of research either. For example, Britta mentioned having to shift the focus of their PhD research into the evaluation of design-led approaches from using them for contextual inquiry in order to persuade their supervisors at the Computer Science department (CRG3 BS: 99-120). This kind of methodological turns was familiar to most design researchers participating in this study, for they had to convince reviewers, supervisors, or colleagues, industry partners at some point for the contributions and therefore value of design-led research.

However, it was argued that these obligatory methodological turns taken to justify and/or evaluate design-led approaches to research could sometimes contribute to the ongoing methodisation of Probes and similar design-led approaches to research in HCI. Chris mentioned how "*it's easy to overwork the Probes as a purely qualitative research tool as opposed to being inherently design research*" (CRG4 CE: 675-676). For Probes required a consideration for design's concern for 'what could be' rather than providing ethnographic data of any sort on 'what is', Enrique likened them to 'thought experiments' within the "*speculative tradition of thinking*" (CRG3 EE: 772-777). While this positioned Probes and their use as part of design-led research¹²³ closer to the critical thinking of humanities than the scientific method of problem-solving, discursivity would be still insufficient in explaining the reasoning and the

¹²³ In section 1.3, I've explained my choices for terminology, for I chose to use 'design-led research' as an umbrella term for any research practices that grounds research in design practices in one way or another both within and outside HCI in comparison to the specificity of 'practice-based design research' that remains exclusive to design research that is of artistic origin. However, here I'd like to clarify my position against the problem-solving or any scientific approach to design.

artifact in the design-led research practices. Similar to the post-rationalisation of the design problem in presenting and justifying the design outcome, discursivity would result in a “post hoc reconstruction of the research process” (Borgdorff, 2012, p. 69), for trying to fit the non-linear progression of design processes into the linear progression of narrative especially in text-based research dissemination formats. Furthermore, the prevailing ‘efficiency’ narratives in the HCI dissemination practices undermined the provisionality and contextuality of Probe insights. Similar to Tom’s use of ‘failed’ Probes as a workshop activity to contextualise them, Chris suggested looking for ways to “*situate Probes within a whole design process*” rather than “*having them out on a limb*” (CRG4 CE: 689-694) as ‘method’, which could result in the uptake of Probe insights as ‘research data’ in the traditional sense. In contrast, Probes and their insights were described as “*a way to curate the direction of our thinking*” (CRG3 EE: 791-801) in a similar manner to the non-linear curation of provisional and non-traditional forms of knowledge in ‘annotated portfolios’ as a ‘designerly’ way of disseminating research (Gaver & Bowers, 2012). As a result, the narratives of dissemination should instead emphasise Probes and similar other intermediary design forms as part of the design process, situating them within the research timelines and finding ways to emphasise the non-linearity of the design-led research processes rather than mentioning them as part of the methodological framework within the current dissemination practices around Probes, reinforcing their ‘methodisation’ in the long run.

While pictorials were valued for having better suitability for disseminating design-led research for offering alternatives to the linear narratives of discursive formats, the structural barriers to their popularity indicated that these problems need to be addressed before introducing alternative formats and processes to dissemination. For example, the biases against the ‘designerly’ manifested itself in the de-valorisation of the pictorial format against the traditionally scientific paper format of HCI. When asked about the reason why they chose to publish in paper format instead of pictorial, Enrique revealed that many institutions would not provide funding for conference attendances to present pictorials for they were valued less as a research output (CRG3 EE: 279-292). While Doenja pointed out to contrast between the

participants' perception of pictorials as any other academic publication and their lesser reputation in academia (CRG3 DO: 427-431), pictorials were also found inconvenient. First of all, there was a lack of digital infrastructure to support such designerly collaboration for more visual, creative ways of research dissemination despite the increasing interest in computer-supported cooperative work within HCI. For design-led research often happened in teams and involved many stakeholders whose contributions would be acknowledged by their inclusion as a co-author, this was of particular importance as a shortcoming of the pictorial format against the paper format. Not only that, but Doenja further explained that ensuring continuity across the visual contributions by the co-authors was much more complicated in comparison to putting together different styles of writing in the case of a paper (CRG3 DO: 294-297). Britta endorsed that "*all the work that goes in pictorial graphic that is basically design work*", further acknowledging that pictorials had the ability to transform dissemination beyond a mere communication of research findings for knowledge transfer¹²⁴ (CRG3 BS: 306-309). However, Enrique recalled his previous experiences with pictorials, where his co-authors failed to appreciate "*the whole labour of illustration and graphic design*" (CRG3 EE: 285-290) that went into a pictorial as a coherent design in itself. As per Eleanor's earlier point about 'probing the knowledge' in a publication, pictorials required even more effort by the reader to enact them due to their designed nature, which contrasted with HCI's reductionist tendencies observed in the '5 takeaways' narrative in dissemination. Enrique further argued that "*people that usually read papers and are not familiar with close reading images*" lack the 'visual literacy' skills to "*stay in the image like designers do*"¹²⁵ (CRG3 EE: 326-333), emphasising the impact of training in not only disseminating in the pictorial format, but also in reading them. This helped explain pictorials' lack of popularity within HCI, where most audiences may not necessarily have the

¹²⁴ Later on in the conversation, Britta elaborated on using design as a 'means' to explore other things as opposed to being an 'end'. In that case, it's interesting to think about pictorials as an end design, because they are at the same time are a means to convey research outcomes. Britta must have thought the same, because they also suggested using pictorials as Probes in the same way fictional abstracts and fictional papers are used within design fiction approaches to explore ideas around dissemination and research narratives.

¹²⁵ I like such statements; no one reads the pictorials "like designers do".

prior knowledge and experience to do so, for which Britta suggested using pictorials as Probes to explore it (CRG3 BS: 309-324). In summary, the invisible work that goes into making pictorials to disseminate design-led research was under-appreciated and simply not worth it in HCI for design researchers, who often ended up conforming to the HCI standards of dissemination. Along with the structural barriers that contribute to their devalorisation, pictorials were left to become “*easy publications*” within the dominance of discursive formats in research dissemination in HCI. Andy explained:

“I’ve done a fair bit of reviewing for it, but [...] I think, unfortunately, that format is often used when people have had a paper rejected and then [...] they image something up and take a few words out, rather than using it as a format for describing that making process. I think people are just very cautious about submitting that kind of work because they’ve probably just been rejected so often, which is a shame.” (CRG2 ABo: 310-316)

While the search for alternative formats for disseminating design-led research should be encouraged for future endeavours, more meaningful ways of revisiting previous work can also be created within the current limitations of discursivity in HCI. The implicit and tacit aspects of knowing in design-led research involve non-discursive forms of experience and knowledge in and through the creation of design research artifacts like Probes. On that note, Arne mentioned that over time, the collection of the “*very vivid memory*” of others’ work at the conferences would feel like “*like a travel diary*”, which then “*connects into a stream of what my design decisions will be*” (CRG2 ABe: 228-240). Therefore, HCI conferences with exhibition and workshop opportunities were particularly valued for their better suitability to disseminate design-led research in more experiential and dialogical ways beyond mere discursivity (Durrant et al., 2015). Moreover, the know-how involved in design-led research practices could not be verbalised or made explicit to share with others, but only became apparent over time to the researchers themselves. This was reflected in how design researchers talked about their previous work “*almost like looking at teenage photos of yourself*” from a perspective that develops over time “*from more experience or changing approaches*” (CRG2 HM: 206-212), and often feeling that they “*could have done better*” (CRG2 ABe: 227).

Such self-critique was so common to all design researchers, suggesting there could be value in finding ways of revisiting previous work in a ‘constructive’ manner¹²⁶ for it “*warrants a whole discussion on its own*” (CRG2 HM: 244-251). This feeling was heightened in Karey’s case, whose paper discussed in CRG1 had received some negative feedback upon publication, potentially because it was one of her earliest without supervisory support. She expressed relief about being able to “*selfishly to say something more about this project*” as well as contributing to the domain of ‘autobiographical design’ when she was given an opportunity to respond to these criticisms in an interview study that also got published in a mainstream HCI venue (Desjardins & Ball, 2018). She further added that this was typical of HCI research politics that was not “*just about generating knowledge for a particular subject, but also kind of building, debating other things too*” (CRG1 KH: 536-551). As a result, design researchers had to find a balance between reporting on what they needed to say to ‘get in’ in a pragmatic manner and what they actually wanted to say about these tensions within the broader design-led research practices in HCI, as well as their own project. However, these were often made implicit in the dissemination partly due to the concerns for anonymity, but also to maintain design’s disciplinary integrity in HCI, where there may be hostility towards design-led research practices that fall outside HCI’s conventional understandings. Therefore, it was important to foster a culture of design research in HCI that can resist the tendency to coalesce and methodise design-led approaches to research such as the Probes, respecting the divergence of research programs and schools of thought within design in the HCI context while turning these tensions into more productive discussions.

While the challenges to revisiting previous work that is already known to the HCI audiences may remain due to the anonymity in HCI dissemination processes, a shift in archival practices and the interactivity of HCI conferences

¹²⁶ Many design researchers I spoke to for this and the previous study mentioned that in one way or another that they’d have liked to change things for the better. While that’s probably the case for any researcher in any other field, I think there’s more value in revisiting previous work in design-led research beyond what Krogh & Koskinen suggested within the lens of “new experimentalism” in their book titled “Drifting by Intention” (2020).

could help contextualise design-led research practices and foster a culture of design and design research in HCI. For example, HCI's failure to understand the contribution of 'designerly' making is a systemic issue than something that can be justified in an individual publication of material limitations. Even the alternative formats that are more suitable to disseminate design-led research would not be sufficient to convey the value and contribution of making because of its tacit and phenomenological aspects, so it was suggested to have in-person workshops and conference tracks on making in addition to the publications. Andy suggested having "*proper making tracks where you could describe the process of making something and you could describe all the different failures*" in the main HCI conferences, and exemplified that just the casing of TaskCam took 100 iterations for them to "*get right*" although not mentioned in their papers (CRG2 ABo: 316-321). Heather resembled this to "*the behind-the-scenes footage that used to be on a DVD in the menu*" and argued to look for ways to incorporate that into publications to open up about different aspects of the work and the 'invisible' impact of dissemination (CRG2 HM: 461-464). For example, it was suggested that publications could be archived on ACM database along with notes by the authoring researchers. Upon Heather's 'behind-the-scenes' suggestion, Andy brought up the idea for "*annotated papers*" and explored ideas for being able to "*read it with the comments switched on, or track changes or something, or a director's commentary of the paper*", along with explanations for the things that get lost or made implicit in the dissemination upon de-anonymised publication (CRG2 ABo: 466-469). Arne further added that videos and pictorials can be uploaded to the ACM library along with the paper as the "*take-outs of the director's cut*" and even more ideas could be explored due to the "*creative capability in our work to bend those venues into telling our stories*" (CRG2 ABe: 471-474). Leveraging the existing opportunities as such would take the burden on individual design researchers to justify, explain and foster a culture of design research as a collective and further lessen the ongoing disciplinary segregation in HCI.

The conversations also implied that the personal nature of design work and the situatedness of design-led research were mutually exclusive with the

anonymous dissemination processes in HCI. Just above, Karey noted how anonymity makes the politics of design-led research in HCI implicit, potentially blocking the way to transform these tensions into productive discussions for design research. Similarly, Dan had earlier mentioned the ‘odd abstraction’ that prevented talking about the specifics and particulars of design-led research and building upon each other’s work in order to be relevant to larger audiences in HCI. Moreover, Andy had emphasised the programmatic aspect of design-led research, where their collective work as a research group over the years created a knowledge base, as well as resources and networks for their future projects. While the submission and review processes were anonymous to ensure fair judgement of research submissions, it created an imbalanced and potentially unfair dynamic for evaluation of design-led research in HCI, in which the authors of a submission can be somewhat recognizable due to the personal nature of design work, while the reviewers remained entirely anonymous. Besides, the use of citations as a means of positioning oneself in order to get reviewed in the right context within the relatively small but highly divergent design-led research communities in HCI was a form of ‘identity-signalling’ that could aggravate the imbalanced dynamic and even mediated gatekeeping of what kinds of design-led research were accepted into HCI. For example, Andy elaborated on their “really high failure rate with papers” at conferences like CHI, DIS, or TEI, which are the main HCI venues for publishing and presenting work. He further added:

“I kind of wonder why reviewers, particularly the design researchers, why we are all so hard on each other?¹²⁷ We seem to hold each other to very, very high standards, at least with the reviews that I get [...] the HCI efficiency brigade, they always seem to review my papers! They always seem to dislike what I’ve done. You do have to be really careful about how you frame these accounts.” (CRG2 ABo: 93-103)

In many ways, anonymity in the review processes amplified the existing disagreements to design-led approaches to research in HCI, combined with the material limitations of the dissemination formats. This false sense of anonymity facilitated gatekeeping and determined what kinds of design-led research was allowed in HCI, as well as who. The abstracted,

¹²⁷ It seems like anonymisation mediates being hard on each other.

decontextualised reporting of design-led research within the material limitations of HCI research dissemination formats and processes further prevented the means of creating mutual understanding within the divergences of approaches. The implicit knowledge and practices around publishing in HCI signified that publications have become a kind of 'bargaining zone', where the element of luck and learned behaviours transformed the submissions beyond means of sharing and advancing the field. Therefore, it was important to foster a culture of design research in HCI that can resist the tendency to coalesce and methodise design-led approaches to research such as the Probes, respecting the collective divergence of research programs and schools of thought within design in the HCI context while turning these tensions into more productive discussions. Design's re-orientation from market practices to academic ones brought with it many questions around social accountability, where the black-boxed and unquestioned expertise in catering to people's needs turned into self-skepticism through public scrutiny. Therefore, even where these efforts to foster such cultures of design and design research was found very valuable for the progression of design research both within and outside HCI, the questions remained: "*will that have an impact on society? Or will that only help us to feel more understood?*" (CRG2 ABe: 332-345).

Historical biases and institutional barriers working against design place a burden of proof on individual design researchers to defend their design research practices and 'disciplinary outsider' position.	Their individual strategies to overcome these barriers and material limitations of HCI research frameworks transform HCI publications into a kind of bargaining zone rather than being mere vehicles for knowledge transfer.
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Chapter 7 – Discussion:

Governance of Design in HCI

Introducing this chapter

Theory is often considered to be more prestigious than practice in the research context. While theory may be perceived and function in different ways for design, making design theory has historically been a task reserved for anyone other than the 'disciplined' designers. Hence, most of these attempts failed to recognise the inseparability of theory and practice in design, if not abandoned altogether.

HCI is increasingly concerned with the diminishing number of conceptual contributions to the field, indicating its ongoing disciplinary problems. As a result, it turns to design theory as a potential source of relief instead of becoming aware of its status as a design field.

In this chapter, I will discuss the troubled sense of ownership in design and the resulting governance of design in HCI. I will elaborate on how design research is attributed value to the extent it can be scientifically governed; in other words, made fit into the existing research frameworks of HCI. My goal is not to endorse gatekeeping or antagonising, but to constructively present the historical disparities within design research. These issues have implications for technological research that may potentially impact society, as well as the future of HCI as a research field.

Key Concepts

Demarcation problem
Design theory
Design methodology
Design entryism
Critical Design
Design research / design studies research
Extractivism
Utilitarianism
Disciplinary decadence
Engaged scholarship
Habitus
Metatheory
Design program
Knowledge claims
Absolute epistemic ideal
Scientism
Space invaders
Theory industry
Discipline
Relationality
Methodological innovation

Chapter 7 – Discussion:

Governance of Design in HCI

7.1 Demarcating design

In this thesis, I set out to demonstrate that design has a demarcation problem¹²⁸: Design research is something design researchers do, but becoming a design researcher is not reserved for designers. Similarly, design is not reserved for ‘disciplined’¹²⁹ designers. For a designer-turned-researcher such as myself, that brings many questions around design education, but one is particularly existential: “Then why study design at all?” In fact, looking at the existing body of ‘design theory’, it is dominated by those who entered design research from a wide range of other disciplines. While some of these disciplines are design-related in their shared concern for ‘designing’, like architecture and engineering, others span across scientific or humanistic disciplines. I acknowledge that this is likely because the discipline of design is much newer compared to those that ‘started’ it. However, it is not just a matter of academic duration – design is an artificial discipline, a ‘make-do’ vocational

¹²⁸ In philosophy of science and epistemology, the ‘demarcation problem’ refers to the ways of distinguishing genuine science from non-science, which includes pseudoscience and other human endeavours like art and literature. However, Laudan (1983) refined the demarcation problem of science/non-science into a distinction of reliable/non-reliable knowledge without a care for its ‘scientific’ status. In fact, he stated that ‘pseudo-science’ and ‘unscientific’ are “just hollow phrases which do only emotive work for us. As such, they are more suited to the rhetoric of politicians and Scottish sociologists of knowledge than to that of empirical researchers” (Laudan, 1983, p. 125). Evolutionary biologist-turned-philosopher of science Pigliucci agreed with Laudan’s criticism of the “old demarcationist tradition” as a “hopeless task”, but added that the history of the problem is in fact “a nice example of how philosophy makes progress” in a similar manner to science, “except that philosophy proceeds in logical space rather than by empirical evidence” (Pigliucci, 2013, p. 12). Further takes on the pseudo-problem of ‘demarcation problem’ argued for promoting critical thinking rather than emphasising the rhetoric of science, indicating that not everything non-scientific is pseudoscientific through the examples of arts and humanities not being sciences, but not pseudosciences either (Pigliucci & Boudry, 2013). The distinction then becomes rather about good and bad science, as well as differentiating a young field of research as a ‘protoscience’ from pseudoscience. Mahner noted that “heterodoxy should be welcomed as stimulating critical debate and research, whereas pseudoscience is just a waste of time” (2013, p. 31).

¹²⁹ By disciplined, I mean those that have studied design domains at design schools for their higher education, such as industrial design, graphic design, fashion design, as part of their higher education.

domain to meet the local market demands¹³⁰. I aimed to reflect that in how I referred to the disciplinarity of design as the “disciplinary project of design” in Chapter 2. However, design research is even more artificial than the discipline of design. It started out with an underlying assumption that there may be a ‘design methodology’ and design research was designed to find it ‘out there’¹³¹. In fact, design research did not even emerge from the discipline of design, but in a top-down manner that excluded the disciplined designers for decades. As a result, it developed outside the reality of actual design practices that continue to haunt designer-turned-researchers even today (Tonkinwise, 2017).

Does this mean we may need to abandon the disciplinary project of design altogether to focus on design research instead? There is high variance even within the outcomes of the disciplinary project of design due to a lack of shared structural and historical factors determining a ‘community’ (Tunstall, 2008 in Davis, 2008). Perhaps, design research would be better off if design researchers were trained in foundational disciplines with proper methodologies and base knowledge prior to design as a way of ensuring the validity of design research. Perhaps, design research is even more ‘homeless’ than HCI research (Grudin, 2006). There is something incongruous about me articulating these to obtain my doctoral degree in design from Northumbria School of Design. Despite what the future may hold for the design school after boundaries and disciplines¹³², I am here now and have always been at one. So, despite what the actual disciplinary status of design may be, I’ve been in, on, through, for, about it this whole time. For me and probably many others

¹³⁰ Throughout the history, design schools emerged out of a local need: Wherever there’s an industry that demands designers, there is a design school that caters to these needs. Ghajargar & Bardzell’s (2019) genealogy offered a brief glimpse of how some leading design educational institutions emerged in response to their local economies and needs. For a more detailed account, Guy Julier’s book titled “Economies of Design” (2017) made these links more clear, although it does not speak of specific design schools.

¹³¹ Here, I use ‘out there’ to refer to two things: First, to address how design methodology was thought to be an external reality in early design research. Second, I refer to Taylor’s (2011) article titled “Out There” to criticise HCI’s Euro-American ‘gaze’ into the developing world. In fact, design research started with the same concerns, albeit an internal gaze, with development purposes after the World War II (see section 2.2).

¹³² For example, Bremner & Rodgers’ (2019) work on “Design school: After boundaries and disciplines” explored the potentiality of an indisciplined design school.

that have been trained as designers, the disciplinarity of design has always been there despite the nuances in our specific domains, personal interests and histories. It was rather porous than non-existent, for design has lacked institutional cohesion that made it vulnerable to ‘design entryism’¹³³, especially in its outer edges (Julier, 2008, p. 44). For example, becoming an interaction design researcher can be as easy as making use of designerly approaches for many HCI researchers of diverse backgrounds, often for pragmatic reasons. Indeed, one can mix and match the existing HCI literature on design research and get published at CHI, as long as they know who to cite or participate in HCI’s prevailing dissemination practices. This is implicitly known to different design communities in HCI, often referred to as ‘cracking the CHI code’ or ‘playing the game’. Perhaps because of this and the HCI evaluation criterion for novelty, empirical work dominates most of HCI research with increasingly less conceptual contributions (Oulasvirta & Hornbaek, 2016). In fact, it is probably more fruitful for a researcher to find a gap in the undiscovered research territory of technological design and occupy it rather than try to put things together for a conceptual model or framework when our knowledge is supposedly bound to our disciplines.

On the other hand, becoming an interaction design researcher in HCI may entail particular challenges for a designer, ranging from the biases against the ‘designerly’ as part of HCI’s implicit scientism to the lack of research-oriented training in design education as often criticised (section 1.2.1). Furthermore, as the scope of design expands from an instrumentalised problem-solving or ‘shell design’ (in product design terms) as the last step of the research process, design researchers are able to integrate criticality into different aspects of research. In a way, what started out as ‘Critical Design’ has become about critical designing and further critical design research-ing. My methodological choices for identifying ‘designerly’ researchers and their uses of Probes in ‘critical’ ways were informed by such understanding of criticality

¹³³ Julier (2008) used ‘design entryism’ for how anyone can become a designer without specialist training due to design’s lack of institutionalised norms and systems of conduct both in its educational and professional bodies. I think it’s fair to extend this to design’s disciplinarity as a higher education domain.

in design research. In contrast, criticality in regard to design research has been discussed in HCI from narrow perspectives that reduce 'design' to finished artifacts and the designerly critique in Dunne & Raby's original formulation of 'Critical Design' into a matter of aesthetics and stylistic choices (e.g., the oft-criticised dissemination choice of exhibiting their Critical Design objects at art museums). In fact, what Martins & Oliveira have criticised about 'Critical Design' is probably more fitting for the HCI discourse on 'Critical Design': "a vicious circle of navel-gazing and self-appraisal", lacking "diversity beyond self-indulgent, narrow-minded perspectives" (2015, p. 65). I will talk about criticality in design later in section 8.2.1 and the issues around dissemination in section 8.2.2.

In demarcating design, my intention was not to endorse gatekeeping nor antagonising, but to understand how the heterogeneous academisation of design created a porous sense of disciplinarity to design rather than a lack thereof as argued by Rodgers & Bremner on several occasions (e.g., Rodgers & Bremner, 2013). As a result, design has a troubled sense of ownership. For example, many 'designerly' contributions to HCI research (e.g., 'Cultural Probes', 'Critical Design', 'Research through Art & Design') have been widely appropriated by HCI design researchers, in a similar manner to the territorialisation of design research by anyone but designers in its early beginnings (section 2.2). As such, entryism has the potential to 'kill' design in HCI (Pobiner & Mathew, 2007), just as it has the potential to keep it 'alive and kicking' (Rodgers & Yee, 2016), enriched by different perspectives and disciplinary approaches. Building a design community without disciplining design within the Design Research Society (DRS) has been one of the main concerns of the design historian Victor Margolin and design theorist Richard Buchanan, whom Margolin described as "a specialist in the history and philosophy of rhetoric" (Margolin & Buchanan, 1993, p. 22). They were especially influential to the efforts to pluralise the voices within design research and introduce the 'designerly' into design research. Their efforts included the

small conference of “Discovering Design” in Chicago¹³⁴ in 1990 and founding of ‘Design Issues’ in 1982 as “a journal of ideas that will embrace many forms from scholarship to polemics (Margolin, 1984, p. 3).

In many of his publications, Margolin implied an existence of a ‘research recognition gap’ in design, for design research has been monopolised by other disciplines than designers themselves (Margolin, 1992; Margolin & Buchanan, 1993; Margolin, 1995; Margolin, 2000; Margolin, 2005; Margolin, 2010; Margolin, 2016). In order to mitigate the impact of the gap, he suggested demarcating ‘design studies research’ “about reflecting on design as it has been practiced, is currently practiced, and how it might be practiced” from ‘design research’ “about producing design” (Margolin, 2016, p. 8). Its aim was not to break design communities apart, but “to delineate more precisely the nature of the knowledge and capabilities they signify” to ensure that design’s disciplinarity (ibid.).

Margolin further indicated to a lack of mutual exchanges in between ‘design research’ and ‘design studies research’. He argued that ‘design research’, in its vagueness and population by those that “adopt what appear to be valid methodologies to guide their investigations, the questions they pose are often narrowly drawn, have no relation to a larger set of issues, and are consequently of little interest or value to other [design studies] scholars” (Margolin, 2016, p. 1). This is of particular importance to me, for I have felt at home with what Margolin called ‘design studies research’, or design research as I’ve understood it (section 1.6). It means that if the ‘designerly’ continues to be appropriated due to design’s vulnerability to entryism and porous disciplinary boundaries, I may eventually lose my home in design research. While anyone can become a design researcher in HCI and populate design research to potentially subsume, marginalise, and discipline design once again, where would the ‘homeless’ go within the already precarious positioning of ‘design studies research’ in academia?

¹³⁴ Chicago has been an important location for design, for many former Bauhaus lecturers founded the New Bauhaus there.

<p>Demarcating design to position one's design work creates false dichotomies in design, as well as setting unrealistic expectations.</p>	<p>These dichotomies have historically helped position design against art/science, science/non-science; while some positioned design research practices against each other as engineering/creative design, pragmatic/critical design research, design/design studies research.</p>	<p>Demarcating design facilitates a disciplinary gaze into the heritage of design, fostering a troubled sense of ownership.</p>
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7.2 Extracting design

In section 3.2.2, I mentioned that the 'designerly' found a way in for itself through the cracks of an increasingly fragmented HCI in an opportunistic manner, albeit benevolent. Only upon realising the potential utility of designerly research, HCI 'turned' to design and later to design research as I've understood it. In this sense, HCI's turn to design has been 'extractivist' rather than truly inclusive to 'designerly' approaches to research. Despite the peaking interest in designerly approaches to research in HCI, design researchers still need to justify and re-align their approaches in reference to what has been already 'accepted' in the field (section 6.5.1). There are indeed many similarities to how ethnomethodological approaches to ethnographic studies needed justification within the Modern Period of HCI for they did not yield 'design implications' and therefore were deemed 'not useful'. Despite what the collective intellectual and ethical stance of ethnomethodology may have suggested, individual ethnomethodologists had to compromise on those and give in to the '5 takeaways' as part of HCI's prevailing narratives in order to get published (section 3.2.1). Only when we put these in context, we are able to see the origin of the existing norms around dissemination that perpetuate scientific narratives and practices around design research in HCI. However, this knowledge is often inaccessible to a newcomer, so these norms and practices are taken for granted and often uncritically adopted. It has been proven to work, so use attracts more use (Ahmed, 2019). Nonetheless, there's a potential danger that design research that do not fit into those criteria may

eventually be deemed useless, or even superfluous. It may start with a call for divorcing ‘pragmatic design’ from ‘critical design’ as its more designerly counterpart that resists those criteria (Forlizzi et al., 2017). I will talk about this more in section 7.4, but it surfaces some problems around the dissemination of design research in HCI: Where the crucial aspects of designerly approaches to research are made implicit in the dissemination in order to meet HCI’s expectations to research and dissemination practices, they may seem almost arbitrary to an outsider. As a result, rather than understanding those practices as a means of reflecting on design as part of ‘design studies research’ as Margolin (2016) argued, they may be deemed useless for ‘design research’ and its end goal of making design theory. In fact, there has been a race to develop a form of design theory from a wide range of HCI-related perspectives (Koskinen et al., 2011; Nelson & Stolterman, 2014; Redström, 2017; Krogh & Koskinen, 2020; Wakkary, 2020). In many ways, it reminds me of the race to develop design methods in early beginnings of design research, also in order to make design theory (section 2.2.2). Decades of design research should have yielded more critical stances to the *raison d’être*¹³⁵ of design research in its strive for making design theory like that of Rosner (2018). I believe that is especially important for academic design research that is funded by public money and aims to serve society first and foremost. This is not the same as being ‘useful’, which often comes with an underlying utilitarianism (Ahmed, 2019). It does not point at being ‘overly responsive’ to the industry and its demand for technological innovation for economical and technological progress either, as sometimes discussed (Norman, 2010a; Norman, 2010b). In fact, I’ve argued that these concerns brought the Ulm School to its end (section 2.1.4).

However, making design theory should not turn into a competition in its chase for ‘research prestige’ (Leyser, 2014). Design research needs to avoid ‘disciplinary decadence’ in the form of ‘disciplinary envy’ (i.e., the race to make theory in order to justify HCI as a research field) or ‘methodological righteousness’ (i.e., different forms of scientism in HCI), forgetting that “their

¹³⁵ Reason for being, reason to be, justification for existence.

impetus in living human subjects and their crucial role in both maintenance and transformation of knowledge-production practices” (Gordon, 2006, p. 4). What I mean by serving society is to look for ways to bridge the gaps between the university and civil society through ‘engaged scholarship’ (Beaulieu et al., 2018). Perhaps, this is even more important for HCI research due to its concerns around losing relevance to the industry practices that have been impacting society in unprecedented ways (Zuboff, 2019).

HCI design research’s extractivist approach to design (i.e., design studies research) can be further observed in the shift in its end goal from design to design theory throughout the decades of design research in HCI as such. The role of theory in design has been also discussed within design studies research. In fact, it has been discussed in terms of theoretical literacy in order to enhance critical engagement “in the act and practice of *doing* theory” (Agid, 2012, p. 30, emphasis in original). Rather than framing design theory as an end goal in itself as “big-T theory”, theory’s inseparability from the design practice has been emphasised for its active role in ‘worldmaking’ through designing (Agid, 2012, p. 30). Hence, design theory has been understood as ‘habitus’¹³⁶ within design studies research. Indeed, Pizzocaro described design theory “as a formulation and arrangements of the foundations and general principles of a discipline” rather than “as a set of precepts that serve to guide practice or as systems of ideas intended to explain facts or general principles relating to a particular subject” (2018, p. 1.2), where the latter is closer to the traditionally scientific understanding of theory.

Yet, when HCI design research ‘turns’ to design studies to dig for “circumstances of rhetorical crystallization” (Pizzocaro, 2018, p. 1.9) to extract concepts and approaches, as in the example of ‘Research through Design’, it

¹³⁶ As Pizzocaro described: “In sociology, the concept of *habitus* was used by Pierre Bourdieu (1979) to refer to the physical embodiment of cultural capital, namely the ingrained habits, attitudes, or skills that people may possess, given their personal experiences. According to Bourdieu, the *habitus* is a system of thought and action patterns acquired in a lasting manner and generated by objective conditions. The habitus tends to persist even after these conditions have changed; it integrates past experiences and acts by influencing current perceptions, evaluations and behaviours” (2018, p. 1.2, emphasis in original).

imposes that design studies researchers also use these problematic terms. In fact, 'Research through Design' had not been so popular within the design studies discourse outside HCI due to its historical baggage and conceptual problems until the re-appropriation efforts. For example, Pizzocaro noted that the use of 'research through or by design' as a label is stigmatised in Italian design doctorates, because the "still *provisional* use" of these terms "expresses the inertia of an *empty* theoretical framework" (Pizzocaro, 2018, p. 1.10). So, when HCI popularises these terms and 'empty' theoretical frameworks from the early design research (Forlizzi et al., 2009), it sparks reactions amongst the designer-turned-researchers for its regression. For example, when Zimmerman et al. (2007) brought in Frayling's 'Research through Design' into the HCI discourse, they treated the provisionality of these concepts as if in awaiting to be formalised into 'proper' research methodologies (Zimmerman, 2010). This move was slightly belittling in the way it undermined the intellectual capabilities of design studies researchers.

Moreover, it has been argued that Zimmerman et al. misread Frayling's idea behind research through art and design as "making the *right* thing" (2007, p. 493). The idea of 'the right thing' was repackaged as "ultimate particular" (Stolterman, 2008; Nelson & Stolterman, 2014) in their subsequent work (Zimmerman & Forlizzi, 2014). The way they formulated "ultimate particular" in relation to design-led research also entailed a misreading of Aristotle according to Cockton (2018), as well as imposing a restrictive view on design through their body of work¹³⁷ "as if the authors' desiderata (to use their term) is to induct the world into their formal version of design thinking" (Willis, 2004, p. 74). Gaver's influential paper titled "What should we expect from research through design?" (2012) is hence a reaction to this (mis)appropriation, in a similar way to Durrant et al.'s (2015) efforts to re-appropriate 'Research through Design' by introducing a new conference series.

¹³⁷ In fact, I've always found the title of Nelson & Stolterman's (2014) book, "The Design Way" unsettling for its explicit rejection of the plurality to the "Designerly Ways of Knowing" (Cross, 2006). See section 2.1.7 for my argument for how design research made the plurality of design practices implicit and resulted in a 'research recognition gap' (see Chapter 8).

HCI's extractivist turn to design often employs the same strategy: Bringing in concepts and terms from design and gradually 'hardening' them to ensure their 'scientific' legitimacy. In section 4.1.2, I talked about how design resources, especially the outputs of practice-based design research, are often excluded from the scientific 'hierarchy of evidence' for research. Design concepts and approaches that would be otherwise considered as 'soft data' are imported into HCI, where the traces to their 'soft' origins and material histories are gradually removed through a series of citations in the subsequent publications (Ahmed, 2019). This has been the case for the main interests of this research indeed: Probes, Research through Design, and Critical Design, all of which have originated as provisional concepts in non-conventional, 'soft' resources that needed 'hardening' for scientific research. Furthermore, HCI's extractivism is often accompanied by fragmentation that allows for regimentation. For example, 'Critical Design' as a term has been introduced to HCI discourse by Bardzell et al. (2012) rather than the originators themselves. It was a label that was unilaterally attributed by Bardzell and their collaborators to some design researchers in HCI. These 'critical design researchers' included themselves, Dunne & Raby (who had brought the idea to life in their published books rather than the conventional, peer-reviewed research outputs), and Gaver (for his previous collaboration with Dunne for the 'Presence Project' that led to the emergence of 'Cultural Probes' and institutional connections; for both were located at the Royal College of Art at the time and 'represented' the artistic design practices in HCI against the rational approaches to design).

In this paper, Bardzell et al. (2012) first identified "critical design" as a distinct approach within the broader "constructive design research" or "research through design" that they used interchangeably. In doing so, they began territorialising the Critical Design discourse in HCI over a course of publications that in some ways misinterpreted the approach (Bardzell & Bardzell, 2013; Bardzell et al., 2014; Ferri et al., 2014). Eventually, the new generation of 'critical design researchers' spoke and Pierce et al. (2015) published a paper in reaction to Bardzell and their collaborators'

misappropriation of 'criticality' in design. They reduced the underlying ideology of Critical Design (as proposed by Anthony Dunne and further elaborated in collaboration with Fiona Raby) to a set of stylistic and methodological choices in making use of artifacts for research. This reminds me of how Bauhaus ideology was reduced to a matter of aesthetics with the fetishisation of functionalist Bauhaus designs amongst the cultural elite, leading to the unchallenged domination of functionalist aesthetics for a long time in the design world (section 2.1.5).

Besides, Bardzell and their collaborators did not truly consider HCI's history of uncritical uptake, especially towards designerly concepts and approaches, when isolating criticality in design as a distinct approach. As a result, a perception that engagement with criticality was 'optional' rather than being integral to design (Dilnot, 2008), leading to a polarisation between the 'pragmatic' and 'critical' camps as opposed to how they were initially configured (section 8.2.1).

On one hand, this extractivist turn to design normalises design concepts and practices that fall outside HCI's understandings for designer-turned-researchers to build upon and elaborate within HCI. On the other hand, the appropriation mutates these concepts and practices until they become a 'simulacra', a copy of a thing that did not or no longer have an original (Baudrillard, 1994). Then, designerly researchers need to argue against the gatekeeping of terminology that once belonged to their native discourse (section 6.5.1.2). This problem of ownership resulting from 'design entryism' is likely to aggravate the 'research recognition gap' that I will discuss later in Chapter 8. It worries me deeply for my future design research practices in HCI as a designer-turned-researcher if I choose to do so, similar to the intellectual tensions and the invisible emotional work that design researchers mentioned in the studies.

<p>The inseparability of theory and practice in design makes design theory into habitus rather than an ideal.</p>	<p>When HCI turns to design with concerns to make design theory for research prestige, it is often extractive and neglects this aspect of 'design theory'.</p>	<p>HCI's ongoing transformation into an interdisciplinary design field from a design-oriented multidisciplinary one brings with it problems of 'disciplinary decadence'.</p>
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7.3 Programming design

As I've mentioned earlier, HCI has shifted its orientation from design to design theory as its end goal as its understanding of how design relates to research has become more nuanced. However, its concerns haven't been much different than the early design research, perhaps because of the regressively formal approaches to design rather than as a situated practice. The underlying concern of early design research was to come up with a design methodology to inform designing. As such, it was a rather top-down approach to design and making design theory, importing the hypothetico-deductive model of science, namely scientific method (section 2.3.2). Perhaps because of that, when turning to design, HCI purposefully turns a blind eye to the contemporary design studies discourse and research practices. For example, Grudin extensively discussed the relationship to method and theory in HCI (Grudin, 1990; Grudin, 2008; Grudin in Rogers, 2012, p. 6). Others have discussed the role of theory in HCI research practices. For example, Bederson et al. (2003) defined the 'acceptable' theories to use in HCI as descriptive, explanatory, predictive, generative, each serving a particular role in the HCI community. Rogers (2004) attributed further roles to theory as informative, ethnographic, conceptual, and critical in order to expand what's considered acceptable in HCI. She acknowledged that as an 'applied field', HCI is not bound to the same restrictions as the natural sciences, yet stated that "such eclecticism [...] is a weakening of its theoretical adequacy, i.e., being certain that an account is representative of the state of affairs" (Rogers, 2012, p. 18). As such, she marked the ethnographic approaches in the 1990s as the first critique aimed at HCI's use of scientific method to make theory (Rogers, 2012). Of course,

the use of ethnographic approaches has been a site of dissent within HCI, as crystallised in Crabtree et al.'s (2009) paper.

Fuelled by similar concerns and questions for his PhD research, Beck (2017) inquired into the use of theory in HCI by studying research outcomes as only one of the ways to do so. He had a positive outlook on the increasing fragmentation within HCI rather than viewing it as 'weakening' like Rogers (2012) stated. Beck (2017) presented DiSalvo et al.'s argument that the sustainability discourse in HCI benefited from the "remarkable *heterogeneity* of methods, orientations, and approaches" (2010, p. 1975) in order to support his positive outlook on fragmentation and frame it in terms of heterogeneity, diversity, or complexity. I agree with Beck's (2017) critique of Rogers that eclecticism is weakening the adequacy of theory only if viewed and assessed in scientific terms and that it posits a particular position on scientific research.

Throughout this thesis, I've aimed to endorse a plurality of approaches to design, but have also taken a particular position to HCI's turn to design in ways that can be exploitative for the sake of 'diversity'. Moreover, Beck's positive outlook on fragmentation to enrich 'theory' within HCI is not the same as Rogers' concern for HCI 'metatheory'. I'll refer to Redström's (2017) example in regard to 'design theory'. In arguing that theory always have "a direction, an orientation, a purpose", he distinguished "a theory *of* design" (i.e., theory that takes design as its subject) from a "*design* theory of something" (i.e., making theory in and through design) (Redström, 2017, p. 4, emphasis in original). So, the fragmentation in HCI, or the divergences across the different design programs to use Redström's terms, would indeed bring in a diverse range of perspectives into the HCI's 'design theory of sustainability'.

However, the same fragmentation and its "worrying lack of direction" (Rogers, 2012, p. 1) poses great challenges for HCI's metatheory; its disciplinarity, purpose, and research frameworks that negotiate, and sometimes impose, how these design theories of something are made. I have argued in section 2.3.2 that qualitative approaches to research are increasingly engaged with their metamethodological considerations, whereas scientific method has

historically outsourced this task to epistemology. Therefore, there are significant differences to how theory-method relationship is understood and practiced across the diverse research communities of HCI, as part of disciplinary concerns.

Despite the acknowledgement that there are other ways of theorising outside the sciences, an instrumental understanding of method for knowledge production and theory development is persistent in HCI. In contrast, the “innate and often fleeting ontology of practical knowledge” in practice research creates challenges beyond dissemination (Hann, 2015) for making explicit its fundamentally different theory-method relationship. The conventionally scientific dissemination (and research assessment) frameworks are far from neutral in translating practice knowledge into ‘knowledge claims’ as Hann (2015) put it. As a result, there’s a tendency in HCI to methodise the provisional designerly concepts that refer to a range of different practices, for example, Probes, Research through Design, and Critical Design as the main interests of this research. It is not the method of Probes, Critical Design artifacts, or Research through Design (quasi-)methodology that generate knowledge, it is the very practice of designing in the context of academic research. In fact, it is the very practice of researching that generates knowledge in qualitative research practices, for qualitative research is an approach rather than a methodology¹³⁸ (Morgan & Smircich, 1980). Therefore, thinking about the theory-method relationship in instrumental terms would continue to exclude some forms of knowledge from HCI, regardless of how *diverse* it may

¹³⁸ They wrote: “The range of possible approaches to qualitative research indicates clearly that the dichotomization between quantitative and qualitative methods is a rough and oversimplified one. Qualitative research stands for an approach rather than a particular set of techniques, and its appropriateness — like that of quantitative research — is contingent on the nature of the phenomena to be studied. Our analysis affirms the need for a more reflexive approach to understanding the nature of social research, with a focus on the way in which favoured techniques are often linked to underlying assumption. It emphasises a need to approach discussions of methodology in a way that highlights the vital link between theory and method-between the world view to which the researcher subscribes, the type of research question posed, and the technique that is to be adopted as a basis for research. [...] A preoccupation with methods on their own account obscures the link between the assumptions that the researcher holds and the overall research effort, giving the illusion that it is the methods themselves, rather than the orientations of the human researcher, that generate particular forms of knowledge” (Morgan & Smircich, 1980, p. 499).

eventually become. In fact, McCarthy & Wright (2004) made similar arguments in their framing of HCI's turn from rationalism to practice in much simpler terms than how Rogers or others historicised HCI's turns to different approaches. They argued that idealisation over-determines the ways of our thinking (McCarthy & Wright, 2004), similar to Pasnau's (2017) unpacking of how a narrower understanding of science have been positioned as 'absolute epistemic ideal' (section 1.3.3). They wrote:

“Designing computers became a process of transforming formal representations from a statement of a problem or requirements through design specification to artifact, equally idealised. Although these idealizations may not be obstacles in themselves, when they over-determine our thinking about and our practices around technology they are stultifying.” (McCarthy & Wright, 2004, p. 26).

However, the fragmentation in HCI and the antagonism that comes with it has restricted more pluralistic understandings of research, as well as design. The increasing complexity to socio-technological design requires more open-minded disciplinary discussions for HCI rather than maintaining a kind of nostalgia for its Golden Age that has become implicit in its scientism, acquiescent of its fragmentation. Indeed, the way we study the world has world-making effects in the way we *make* theory (De La Bellacasa, 2011). As Rogers noted, innovation indeed came out of the presence of creativity than theory:

“On the one hand, are staunch advocates, arguing that a theoretical foundation is imperative for addressing the difficult design challenges ahead that face the HCI community (e.g., Barnard et al., 2000; Hollan et al., 2000; Kaptelinin, 1996; Sutcliffe, 2000) but that there is a worrying lack of it (Castell, 2002) echoing earlier concerns about the field that ‘there is only an HCI theory vacuum’ (Long, 1991). On the other hand, those that favour the development of empirically based methods to deal with the uncertain demands of designing quite different user experiences using innovative technologies (e.g., Landauer, 1991). After all, many popular methods, innovative interfaces and design solutions have been developed without a whisker of a theory in sight.” (Rogers, 2012, p. 13)

<p>Theory-method relationship is made implicit in HCI's rapid expansion as a research field and manifests itself in the form of scientism within the resulting fragmented knowledge production.</p>	<p>Disseminating practice research in the science-based academic research frameworks despite its fundamentally different theory-method relationship results in a failure to distinguish knowledge from knowledge claims.</p>	<p>The implicitly scientific ideals over-determines our thinking about 'design theory' and design research practices, leading to misappropriation and methodisation of rather provisional design-led concepts.</p>
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7.4 Including design

As per Rogers' note above about innovation, designerly contributions to the HCI design discourse have also emerged in the absence of a 'design theory' in the conventional sense. Indeed, they have emerged from 'trained' creativity that embeds creativity "in the act and practice of *doing* theory" (Agid, 2012, p. 30, emphasis in original) (section 7.2). However, scientism tends to mistakenly perceive creativity as an 'anything goes' attitude for it resists formalisation (section 2.3). I've talked about scientism throughout this thesis, but in this section, I'd like to elaborate further on its impact on the partial inclusion of design in HCI.

Defined as the belief in the supremacy of the sciences in the realm of knowledge, scientism claims that there could be no "other ways of knowing" than the natural sciences (Boudry, 2020). Its extremist view ranges from the most radical one implying that all humanities and social sciences are 'rubbish' to the ones that imply only the (natural) sciences' 'superiority' (Hietanen et al., 2020). Therefore, epistemological scientism enables "illegitimately colonizing other fields of inquiry" (Boudry, 2020). We see the stigmatizing effect of scientism in the colloquial distinction of 'hard' (natural and formal sciences) and 'soft' sciences (social sciences) based on the perceived methodological rigor, exactitude, and objectivity. The snobbery within the realm of knowledge may also show itself even within the natural and formal scientific disciplines based on their inter-dependency on one another for knowledge and methods,

as Figure 1 humorously depicts¹³⁹. As a result, scientism is not just about the sciences/non-sciences distinction, but extends further onto considering applied research and its concern for real-world solutions as less prestigious than basic research and its virtuous concern for universal knowledge. Hence, scientism entails a regimentation of disciplinary boundaries as a symptom of ‘disciplinary decadence’ (section 7.1.2).

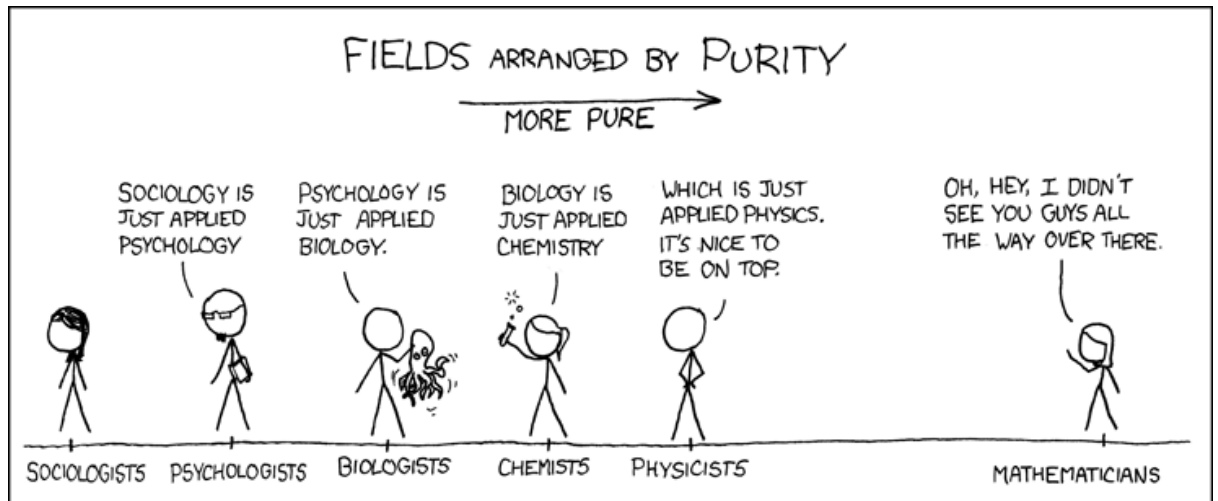


Figure 1. Fields arranged by ‘purity’. Taken from <https://xkcd.com/435/>¹⁴⁰

It is in this context design was included in HCI rather than becoming part of it. For a long time, the ‘designerly’ approaches to research were viewed as superfluous for they fell outside HCI’s understanding of design as ‘instrumentalised problem-solving’ (Pierce et al., 2015). HCI turned to ‘design’ only when these ‘designerly’ approaches have proved their ‘utility’ as offering a potential way out from its ‘crisis’. Strathern emphasised the impact of crises on the development of disciplines, and by crises she meant “issues that may have been in the making for some time, and then suddenly gather momentum” rather than “catastrophes” (2004, p. 2). For HCI, that crisis entailed becoming increasingly aware of the limitations of scientific approaches to studying

¹³⁹ Here, purity of a field entails self-consistency and independency from the other disciplines for knowledge and methods used, implying that methodological self-sufficiency makes a field superior. Any disciplinary transgression would then be something to evade.

¹⁴⁰ The Reddit thread on this cartoon offers some interesting points about it; for example, user ‘tyrsson’ stated: “It seems many people are missing the point that the comic isn't funny because it reflects an accurate portrayal of the scientific merits of each discipline, but rather because it accurately reflects the attitudes of practitioners in each discipline.”

human-computer interaction a 'human factors in computing systems'. Strathern further argued that crises prompt the ready-at-hand use of "[m]ethods and theories devised for other purposes have to be pressed into service" in a "response-mode investigation" (2004, p. 2). As technology started moving into contexts that are inaccessible to 'scientific research', 'Cultural Probes' as a ready-at-hand method offered a way of out of the lab, into the domestic contexts. As such, the turn was not to the discipline of design but its methods, without much consideration to what 'method' may mean in design or its portability. Their usefulness brought with it many misappropriations as well as many derivations (Boehner et al., 2007), hence the 'methodisation' of Probes began in HCI (section 6.5.3). It further encouraged an extractivist turn to contemporary design studies research, as well as to the early design research (section 7.2).

Many designerly approaches to research were imported into HCI for their potential usefulness. For example, Frayling's 'Research through Art & Design' was brought in to compensate for the shortage of a 'design-led methodology', but only partially. Despite the artistic origin of the term, its transformation into 'Research through Design' was a symptom of how HCI understood design and what was considered acceptable in regard to 'designerly'. On that note, Pierce et al. stated: "Anything else was considered superfluous, or, worse, art" (2015, p. 2083). Dunne & Raby's 'Critical Design' was brought in later as its more 'critical' counterpart to compensate for the overtly rationalised appropriation of RtD as a design-led methodology. It entailed an understanding of design as "art with utility" (Julier, 2017, p. 40); however "the frustrating lack of instrumental outcomes in the arts" (McNamara et al., 2019, p. 3) posed challenges for the justification of these practices for research. As 'Critical Design' gradually gravitated towards a more artistic realm and treat the 'Critical Design' artifacts as art in order to generate knowledge, HCI's underlying condition for design as utility surfaced in the efforts to divorce these two 'methodologies' of Critical Design and Research through Design (Forlizzi et al., 2017).

Therefore, it became clear that HCI's inclusion of design has been contingent to its usefulness, or more specifically its 'methods'. As Sara Ahmed put it; "An

instrument can also thus be understood as the loss of externality: *becoming useful as becoming part*" (Ahmed, 2019, p. 11, emphasis in original). Thus, design's inclusion in HCI entailed a form of 'disciplining' through its conditional and partial inclusion. It didn't go unnoticed when it re-surfaced and was critiqued through designerly explorations for non-deterministic art practices and the notion of 'contribution' in HCI (e.g., Andersen et al., 2018; Devendorf et al., 2019).

The partial inclusion of design also surfaced in the self-organising way designer-turned-researchers were included in the field. Borgdorff (2012) argued that academic research has been 'owned' by science, where research was often understood as basic research as opposed to applied research, and later on as research that makes use of 'scientific method'. He argued that this created a burden of justification for the novice disciplines in academia, by which he meant the practitioners of the new modes of knowledge production like practice-based researchers (ibid.). He further pointed out that "the prerogative of the old guard that thinks it holds the standard of quality against the rights of the newcomers who, by introducing their own field of research, actually alter the current understanding of what scholarship and objectivity are" (Borgdorff, 2012, p. 55). This was evident in the way designerly approaches to research was more likely to be accepted in HCI upon methodisation rather than kept as 'practices' as designerly researchers understood them (section 5.5.1).

This created particular challenges for designer-turned-researchers, for their novice disciplines had a destabilising effect on the traditional understandings of 'research' as Borgdorff (2012) argued: They became 'space invaders' for their presence defied the long-standing boundaries of research, disciplinarity, and also design in HCI. Postcolonial studies scholar Nirmal Puwar (2004) argued that bodies out of place become 'space invaders' when their dissonant bodies take up space in positions that have not been 'reserved' for them. She further investigated the ways the space invaders were micro-managed despite their seeming inclusion, which are helpful in understanding the ways design is disciplined in HCI as I will explain now.

First of all, space invaders often have to justify their existence (Puwar, 2004). For design, its novice and undisciplined position in academia enables locating design researchers in a wide range of academic contexts beyond the 'design school'. Its precarious positioning in academia as a 'discipline' creates different challenges for these design researchers. For example, a designer-turned-researcher working within the 'comfort zone'¹⁴¹ of a design school can choose to confront design's disciplinarity in order to challenge, subvert or expand it. A well-known example to this is Dunne & Raby's¹⁴² 'Critical Design' practices emerging from the Royal College of Art (RCA).

On the other hand, a designer-turned-researcher may also work outside this comfort zone, for example, under a different department like computer science and engineering for the close alignment of their work to those. This was observed across the study participants for their HCI-related work enabled their positioning within different departmental configurations as such (section 5.4 and section 6.4 for the overview of the study participants). Therefore, the latter is confronted with design's epistemological and methodological differences to these preceding disciplines where they may have to defend design's capabilities as a mode of disciplinary knowledge production more often than those remaining within the comfort zone. As the researchers of a novice discipline, 'the burden of proof' rests with them especially in these contexts (Borgdorff, 2012). Apart from having to justify their existence in those spaces that have not been 'reserved' for them, they may even face hostility. This was especially evident in the contrast between Britta and Enrique's experiences of 'everyday hostility' as designers at the computer science department in its subtler forms and Andy and his team's exposure to more overt forms of hostility at HCI conferences for challenging the conventional ways of HCI

¹⁴¹ This is not in any way to suggest that working within the 'comfort zone' is any easier than working outside of it. Both come with challenges of their own, yet design's disciplinarity creates a greater degree of issues for the design researchers outside this comfort zone.

¹⁴² On their website's FAQ, Dunne & Raby includes their graduate students James Auger, Elio Caccavale, Noam Toran as 'Critical Design' practitioners, as well as those that work in a similar way without describing themselves as such like Krzysztof Wodiczko, Natalie Jeremijenko, Jurgen Bey, Marti Guixe. Taken from: <http://dunneandraby.co.uk/content/bydandr/13/0>

research (section 6.5.4.2). While it was clearly the case that Andy and his team had a greater degree of freedom to do so within their own design department, this does not mean that they were exempt from the structural barriers within academia for design researchers.

Secondly, the methodisation of designerly approaches to research in HCI enabled design researchers to make use of these already-accepted approaches beyond using them for research. Here, I'd like to refer to Ahmed's distinction of making use vs use, where making use entails an active and creative effort to transform a limitation or restriction into an opening (2019). For example, despite their divergences from the existing stances to Probes, RtD, or Critical Design in HCI, design researchers made use of their methodisation, conceptual and methodological ambiguity in the literature to 'get in' (section 6.5.1.3 and section 6.5.4.2). As such, Probes were used as a form of 'endorsement' for becoming insiders (Puwar, 2004), as a rite of passage for becoming a design researcher in HCI (section 6.5.1.1). Puwar (2004) further pointed out to the use of language as a means of governance, where it acts as a boundary marker. This was evident in how design researchers often adopted the prevailing citational practices, research narratives of HCI underlined by an efficiency rhetoric and the language of Probes despite their ill-suitability for disseminating designerly research.

Thirdly, although the issues around design's partial inclusion are known across the diverse designerly communities in HCI, they are made implicit despite their impact both on research and design researchers themselves. The opportunities to express these concerns that especially impact early career researchers are often rarefied, even restricted to a few that have proven themselves. As a result, becoming a design researcher often entailed "an assimilative pressure to conform to the standards and values set by the template" (Puwar, 2004, p. 147). The intellectual tensions of strategically taking part in HCI's norms around dissemination was especially echoed by Arne, for whom the challenges endured into the latter stages of his academic career (section 6.5.4.1). Indeed, Puwar stated: "Certainly those outsiders who do not discuss their difference and just try to blend in with the norm are more

likely to be accepted and to succeed. As a strategy of survival, then, they might judge it more pragmatic to remain silent and to concentrate on the job” (Puwar, 2004, p. 154). Hence, when I invited design researchers to take part in my studies to make the invisible visible, I’ve received feedback on the timeliness and relevance of the topic. While some participants described the second study as “a much-needed support group” (CRG3 DO: 693) during the interviews, some others showed appreciation for the opportunity to share their collective experiences for the development of the field in response to the invitations to take part in the study.

Finally, the accumulation of divergent ‘Probe’ interpretations in reference to the original source and some other key papers from the previous decades indicated to an internal ‘disciplining’ of design that restricts design’s inclusion in HCI¹⁴³. Design researchers mentioned how anonymous peer review processes created an imbalanced power dynamic between the reviewer and the submitting¹⁴⁴ authors (section 6.5.4.2). As such, peer review was a means of enforcing disciplinary orthodoxy without confrontation (Schwartzman, 1997). It was acknowledged that the fragmentation within the design communities in HCI introduced an ‘element of luck’ in receiving fair judgment in the review processes due to the way reviewers are allocated in HCI (section 6.5.1.2). It often brought a necessity to decontextualise and abstract the reporting on Probes to ensure relevance to the anonymous reviewers (section 6.5.2.1). In order to get reviewed in the right context, citations were used as a means of positioning (section 6.5.1.3), or even identity-signalling (section 6.5.3.2). Overall, Probes facilitated easier monitoring and administration of design in HCI through anonymous peer review processes, in line with Ahmed’s argument to the implicit uses of framing use (2019). For example, it became

¹⁴³ A seminar note from the earlier stages of my PhD reads: “Everything is a Probe!”. I had the impression that any approach that made use of designed artifacts in design-led research for other purposes than data collection or those of the conventional research methods of HCI was a Probe. It felt chaotic and I initially wanted to organise them through a literature review or taxonomy in a similar manner to Boehner et al. (2007) or Matthews & Horst (2008) work respectively. However, talking to design researchers who have used and published on Probes urged me to explore the implicit aspects and structures behind it rather than organising Probes. Our framing of designerly interpretations of Probes as ‘critique of method’ (Çerçi et al., 2021) aimed to reflect this destabilising aspect of Probes as a way of creating divergence.

¹⁴⁴ Pun intended.

an organising and disciplining matter for design in HCI in the accumulation of a wide range of approaches to using designed artifacts for research (Ghassan & Blythe, 2016). Where designerly approaches to research are not accepted, Probes became a matter of ‘social cloning’ in order to ‘get in’ (Puwar, 2004) through superfluous justifications of the ‘method’ for ‘burden of proof’ always rests with the novices (section 6.5.1).

Neither HCI’s inherent design-orientation (Fallman, 2003), nor turn to design research did not entail the inclusion of design as a discipline. Where the former limited design research’s capacity to its end goals, the other brought in only the relevant methodological approaches. As a result, design wasn’t included in HCI to further explore the capacity of design practices for different kinds of knowledge, but for its “theory industry”¹⁴⁵. Therefore, it’s not surprising that much of the practical work disappears into conference tracks at HCI venues. While these are more suitable for disseminating the outputs of design research, they are also less prestigious than a conference paper that get archived and made available for distribution even after the event. Although papers get to live longer as per Karey’s comment on “the ongoing life of research outputs”, other kinds of knowledge remain exclusive to the lucky few who were there. The backdrop to the HCI design publications make the field inaccessible to a newcomer in terms of navigation, unless they have the resources to get there; mainly time¹⁴⁶, support networks and mentors. HCI design publications are far from ‘neutral’ in terms of research dissemination

¹⁴⁵ Rogers (2012) referenced Kristine Stiles (1996) for this term, who talked about how the artists themselves used to be the producers of written theory rather than limiting their actions to making through the examples of artist writings prior to the creation of a “theory industry” in the 1980s. Some of the examples Stiles used were indeed involved with the Bauhaus School of Design or occupied many other domains outside the art world. However, the changes to the art world in the 1960s, such as Barthes’ influence with his book ‘The Death of the Author’, meant that art could no longer spoke for itself, but neither could the ‘dead’ artist. Therefore, the professionalisation of arts created specialisms that are interconnected yet demarcated, such as art critic, curator for ‘linguaging’ art until artists started undertaking studio-led PhD research to be able to speak about their art once again, as elaborated by the artist Mark Titmarsh (2013). This is in many ways similar to the marginalisation of arts & crafts in design that resulted in the biases against people who make things and their questioned ability to speak about it until the inclusion of practice-based research in art & design (see section 2.3). I will be discussing this further in regard to criticality in Chapter 8.2.1.

¹⁴⁶ Even though it is my research topic and I’ve spent 4 years regularly reading HCI literature alongside design, I still don’t think I have a comprehensive view of the field.

and knowledge transfer: They often come from a matter of concern or care. They are far from being self-contained pieces of knowledge transfer: They are often carefully curated pieces of text that present a project from different aspects, divided into several publications, often by several authors. They are far from HCI's expectations for knowledge production as "an empirical matter of uncovering through fieldwork the methods that members employ to account for, accomplish and organise action and interaction in the settings they inhabit" (Crabtree et al., 2009, p. 885): They are 'cultural texts' for they are instantaneous snapshots of the field's concerns, expectations, and norms at the time. Therefore, navigating the HCI literature within the current archival practices require an implicit knowledge of the field, of key people, ongoing debates, and its history; all the while the search for an elusive CHI paper continues (Gaver & Höök, 2017a; Gaver & Höök, 2017b; Pohl & Mottelson, 2019; Nacke, 2022).

<p><i>HCI's ongoing disciplinary problems facilitate a turn to design, albeit partial based on the utility of the design-led concepts and processes as a potential way out of the crisis.</i></p>	<p><i>As a result, design researchers have learnt to adapt to the politics of design research in HCI and self-organise themselves around design-led concepts like Probes and Research through Design.</i></p>	<p><i>HCI needs to acknowledge that it is an interdisciplinary design field rather than a multidisciplinary design-oriented one in order to explicitly discuss its underlying scientism.</i></p>
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7.5 Disciplining design

In the previous section, I talked about how design is only partially included, resulting in a kind of accumulation of designerly research within HCI rather than being truly included. Hence, there is an observed lack of coherence across these fragmented designerly communities, especially in regard to their use of terminology. This was the reason why I included the keywords of design, design research, codesign, co-design, participatory design, as well as research through design for making a case of the 'designerly' research rather than engaging with the micro-politics of terminology in section 4.2.2. Similarly, I find design's inclusion in CHI as a sub-committee is somewhat dividing. It is

not the case that paper submissions for the outputs of designerly research are limited to the sub-committee of design. Anyone can submit to any relevant CHI subcommittee and many of the other sub-committees include designerly researchers within their list of sub-committee associate chairs. Upon a close look at these lists, designerly researchers seem to have gathered mostly around the sub-committees of ‘Critical and Sustainable Computing’, as well as that of ‘Design’ according to the sub-committee and chair list of CHI 2021 website¹⁴⁷. It is likely because design is inherently critical; however, it is also likely that criticality is made into an option for design in HCI. For example, when I check the sub-committee of ‘Computational Interaction’ overtly emphasises scientific criteria like ‘rigor’, ‘generalisability’, ‘replicability’, I also see a manifestation of that in the sub-committee description as follows: “In addition, critical viewpoints and negative findings are welcome”¹⁴⁸. This is a rather anecdotal evidence, but this research is indeed about the implicit aspects of how HCI has been disciplining ‘design’. Therefore, I will refer to ‘discipline’ as a final note to governance of design in HCI.

Discipline has many meanings, including the practice of training people to correct and control their behaviour. This training is a means of their governance. Order is ensured and obedience is enforced through punishment where necessary. Looking at the academic notion of discipline as the organisation of knowledge into departments from this understanding of discipline indicate the regimentation processes that go into the making of a discipline. The etymology of the word hints at even more: It comes from ‘discipulus’¹⁴⁹, the Latin word for ‘pupil’, meaning student. What I understand from this beyond an understanding of academic discipline as mere organisation of knowledge departments is that a student gets disciplined through their academic training, that they are expected to adhere to a

¹⁴⁷ See the link for the full list: <https://chi2021.acm.org/for-authors/presenting/papers/selecting-a-subcommittee>

¹⁴⁸ Taken from CHI 2021 website, link as follows: <https://chi2021.acm.org/for-authors/presenting/papers/selecting-a-subcommittee#Computational-Interaction>

¹⁴⁹ The same root word also gave rise to the word ‘disciple’ as food for thought: Although it is often understood as the followers of Jesus in Christianity, disciple means one who accepts and assists in spreading the doctrines of another.

primordial structure. The higher the degree of individual's adherence to the structure, the higher the coherence of the structure gets, hence its power and ability to maintain order through absorbing divergences. Once the structure stabilises itself enough to do so, it has an agency that cannot be neglected in the ways it will want to maintain itself through ordering of people, ideas, and concepts. For example, even where the Golden Age of HCI is long over, the scientific domination continues to absorb the divergences. Similarly, within the broader context of academia, there's an increasing divergence in terms of research approaches and philosophies in many disciplines outside the natural scientific disciplines. Yet, institutionalised 'discipline' strives to preserve their qualities (Strathern, 2004), regardless of the changing minds, technologies, and societal contexts. The more orderly a discipline is through normative curricula, code of conduct, and shared practices, the stronger its boundaries will be against 'entryism'. Hence, its internal problems and disagreements will stay within rather than making it vulnerable to appropriation and disciplining from the outside. Moreover, there is an underlying ideology to the formation of discipline as its closely-related word disciple suggests, one that may not always be clear to the student of that discipline¹⁵⁰. Yet, because disciplinary formations in academia are based on the idea of creating, maintaining and even extending order; they have become an order-machine that resists change and critique by definition. Therefore, the increasingly 'critical' approaches resist being disciplined, even where they may be born within a discipline, they exist as a body of what's termed 'Critical Theory'. This indicates to a greater problem within academia for isolating criticality is not exclusive to design research in HCI. Perhaps because of that, the increasing complexity of today's problems¹⁵¹, namely 'wicked problems'¹⁵², evade our disciplinary approaches to 'problem-solving' to use Laudan's (1978) term. On that note, Gordon said: "disciplines, in this sense, become epistemological or knowledge-producing models that offer proven ways under the imposition of

¹⁵⁰ For example, I've mentioned in section 4.1.1 the colonial origins of the social scientific research and in section 2.2 the modernist origins of design research.

¹⁵¹ Or more likely, they have always been complex, but we weren't aware of it until they became unsolvable through our usual methods and approaches.

¹⁵² As per the footnote above, I actually believe all problems are wicked, yet we don't know about it until we are able to observe its impact within the limits of empiricism.

which reality ... sighs" (2006, p. 3). Perhaps the problem lies in the way we only view the world from a set of problems to be answered through research, as emphasised in the formulation of 'research problem' in the conventional dissemination structures rather than expressing research aims and interests that allows for the researcher's unique perspective and possible shifts in the research trajectory. For research in art and design, research problem is almost always retroactively constructed due to the nature of not-knowing. Perhaps because of that, I struggled with coming up with a research question for this thesis, even after writing it up (section 1.2.6).

While many disciplines may take their disciplinarity for granted to varying degrees, disciplinarity is not something to be taken for granted for the inherently critical, constantly changing, relational nature of design. Design's disciplinary obedience (Abdulla, 2021) requires explicit discussions of its disciplinarity beyond the 'metamethodological' concerns. Yet, it can be difficult to do so when the academic term of 'discipline' is also taken for granted and rarely discussed in academia, for it is a foundational concept derived from 'ordinary parlance' (Kockelmans, 1979b, p. 16f.). Rare exceptions to this is Kellert's broad definition as follows: "knowledge-producing enterprises with some shared problems, with some overlapping cognitive tools, and with some shared social structure" (2009, p. 29). While institutional organisations offer a straightforward way of determining the disciplinary boundaries, the reality of disciplines is a much more complex picture.

Even though the Foucauldian sense of disciplining through training suggest a sense of order and coherence for a discipline as discussed above, many disciplines entail "internal incoherence" and "considerable internal heterogeneity" in regards to their approaches and epistemologies (Hvidtfeldt, 2018, p. 37). The degree of this incoherence and heterogeneity is amplified for disciplines that draw upon multiple disciplinary bases, such as political science, criminology, design. In order to signify this dependence on the other disciplines for knowledge and methods, such disciplines are often called an 'interdiscipline' to nuance the notion of disciplinarity in academia. When an interdiscipline has enough coherence to have its own dedicated research

journals, conferences and university departments, it is often referred to as a discipline rather than specifying its nature as interdisciplinary. In other words, it is the institutionalisation processes that stabilise an interdiscipline enough to turn it into a discipline. In that sense, design has become a stabilised discipline on the surface.

However, design's relationality and ongoing flux continue to create divergence and destabilisation, while the porous boundaries to its unfinished sense of disciplinarity (i.e., the unfinished disciplinary project of design) exposes its internal incoherence. Furthermore, due to the heterogeneous academisation of design and the semantic ambiguity of the word 'design', design research is fragmented, creating disciplinary problems that are indeed very similar to the theoretical/metatheoretical concerns within the 'discipline' of HCI (section 7.3). Making design theory without addressing these first is likely to increase the existing fragmentation within design research. I understand Redström's (2017) intermediary notion of design program intends to nuance 'design research' as opposed to disciplining it in order to make design theory, as implicated in his emphasis on the 'transitional' nature of design theory.

However, it is likely that design programs will become an end than a means for design theorising, becoming a form of territorialisation (section 2.2.3). By locating innovation this time in a programmatic approach to design research, it is likely to create a new race to develop 'design programs'¹⁵³, sitting in between the race to develop 'design method' in early design research (section 2.2.2) and the race to develop 'design theory' in contemporary HCI design research (section 7.3). Although not yet addressed in terms of programs according to Redström's spectrum (see Figure 2), different approaches to design in HCI, such as 'ludic design', 'reflective design', 'soma design' to name a few, can be thought of as 'programs' for their varying degrees of internal coherence within. Their contribution is not in the program itself, but in the

¹⁵³ In fact, I've already seen an example by Søndergaard (2020), presenting and advocating for 'troubling design' as a design program for designing with women's health. Hers is a call for considering neglected aspects of designing 'for' women's health and acknowledges the politics of demarcation involved in the notion of program.

perspective each brings to the practice of design. As such, their ‘methodological innovation’ (Yee, 2010) lies in their critique of rational approaches to design. Rather than being an end goal in itself, the program is a ‘byproduct’ of their innovation or contribution. However, when Redström locates contribution in the program itself by saying that a design program is where “research through design may make its most important contribution to design” (2017, p. 41), ‘program’ accepts and normalises the fragmentation within design research (section 7.1). It shifts the focus from the disciplinary and meta-theoretical problems of design research into the micro-politics of programs in design, all the while design research remains vulnerable to get ‘disciplined’.

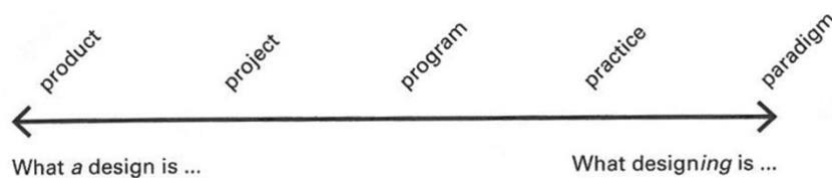


Figure 2. Redström's (2017) spectrum for making design theory within the programmatic approach to design research, spanning from the particular to the universal.

I'd like to finish this section on a positive note to also emphasise why the following section is particularly important. I've talked about the governance of design in HCI in regard to demarcating, extracting, programming, including, and disciplining design, all of which have strongly negative connotations for how HCI treats design. My aim in doing so was not to antagonise HCI and its practitioners of different forms and understandings of design research. Instead, I aimed to point out to the problems in trying to do so, starting with the title of this thesis and the approach to understanding design research in HCI. Perhaps the problem lies in the artificiality of design research. I've talked about the porous boundaries of design research throughout the thesis and the entryism that came with it. I've also talked about how difficult it can be to get to the design research, especially in section 4.1.2 when explaining my methodological choices in searching scholarly databases for design-related literature. Even though I have been trained as a designer and have been familiar with what's considered to be 'design theory' for 12 years now, I still needed to follow rather unorthodox ways to find design research. I had the

prior knowledge for what and whom to search for, as well as how to find design due to my privileged immersion in the know-how of not one, but many design schools. Yet, similar to how design researchers talked about knowing who to cite for positioning one's work in order to get to the right context for reviewing for design-led research in HCI (section 6.5.1), I acquired this knowledge through my support networks.

Despite design's porosity and relative accessibility as a 'discipline', this know-how remains reserved for design schools. Hence, an outsider's interest in designerly approaches to research is welcomed by the early design research or the rational, engineering-based approaches to design. It offers a more accessible way into design research not only through its greater visibility on the scholarly databases, but also in its emphasis on 'rationality' in comparison to the 'design school'. Where design school requires a commitment to acquire the tacit know-how of practice, the transfer of rationality and knowledge becomes a more available option for an outsider. Besides, the prevailing biases and perceptions around design school as a home to privileged, (overly-)aestheticised, fanciful practices (see footnote in section 2.2.2) may be even inhibiting for an outsider, unless they are located at or in proximity to a design school. In order to address that accessibility problem, we first need to acknowledge the existing visibility problem of practice-based design research. In the following chapter, I will talk about the 'research recognition gap in design' as part of my contributions to the design studies discourse.

<p><i>Design researchers self-organising themselves around certain concepts and practices is a result of disciplining design in HCI.</i></p>	<p><i>Design's disciplinary disobedience requires nuancing rather than disciplining; however, it gets absorbed into the existing research frameworks that favour certain aspects and approaches to design research.</i></p>	<p><i>The visibility problems of practice-based design research result in reinforcing the entry barriers into design, while some 'disciplined' approaches to design research are propagated.</i></p>
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Chapter 8 – Conclusion:

Research Recognition Gap in Design

Before moving onto the elaborating on the different aspects of the disparities in terms of worth, visibility and acceptance of design within academia, I'd like to make a note of why I called it 'research recognition gap'. I've mentioned earlier that the latter entrance of designer-practitioner-researchers into academia happened only after the inclusion of practice-based forms of design research in the 1990s. Before that, the practice-based forms of design research happened mainly in engineering or art schools. However, these were not considered to be 'research', but 'experimental development' in isolated development to each other and to 'design research' (section 2.2.3). Within the changing context of academia, these almost conflicting approaches to design were put in the same basket of 'design research' when these schools were included in the third-cycle education. As design became an autonomous discipline, 'design schools', similar to the Bauhaus and Ulm Schools (section 2.1), started to emerge. While some maintained their connections to their origins in engineering or art, some looked for new ways of framing design research. It only became apparent over time that there were disparities within design research that impacted especially one approach to design; namely those aligned closer to practice research.

Despite the disadvantageous start to academia in terms of lacking research culture throughout design's transitioning into an autonomous discipline, design schools of engineering origin had an advantage over the others: Not only they had been previously deemed the primary custodians of design as the 'professional designers' (section 2.2.3), but they further inherited the rationalistic legacy of design research. For example, some of the key ideas and texts from early design research indeed came from engineers. Moreover, rational approaches to design were a better fit for academia compared to the messiness of design practice as a knowledge production domain, especially those of artistic origin. Academia and its research frameworks weren't equally

welcoming to all of these newcomers. The structural challenges and biases continued to impact *some* design researchers more, creating disparities within the contemporary design research on top of the existing heterogeneity and stratification (section 4.1.2). While one's knowledge claims could be somewhat disciplined to participate in "The grand game of the GAS [Great Archive of Science]¹⁵⁴" (Volonté et al., 2018), the other's claims were put into physical boxes and locked away (Hann, 2015). Design practice was already ill-fitting for academia due to the challenges of its implicit and other forms of knowledge. Hence, it was easier to lock its 'knowledge claims' away than destabilising the academic research frameworks to look for ways to accommodate it. Where visibility mattered in terms of knowledge transfer, distribution and evaluation, practice-based design research fell behind the rational approaches to design within the contemporary design research.

Hence, this gap within design research reminded me of the 'gender pay gap', for both addresses a kind of equity gap resulting from historically systemic exclusion. More importantly, I liked that the pay gap reference emphasises that top-down approaches to equality and diversity would not be enough unless supported by bottom-up approaches and culture change strategies and that it acknowledges the variances within a group. For example, I aimed to make these disparities within interaction design research in HCI more visible and called for fostering a culture of design and design research in academia (section 6.5.4). By referring to 'research' in the naming of the gap, I aimed to emphasise the exclusionary history of academic research. Despite their long-existing traditions of knowledge production, some practices were excluded from the definition of research for they didn't fit the academic criteria based on the sciences (section 2.3.2). Yet where the 'knowledge claims' are not treated equally, the 'recognition' gap persists. I demonstrated how the knowledge production capacities of different approaches to design research are not met with the same kind of suspicion in HCI (Chapter 6). Similarly, when terms and approaches are extracted, appropriated and populated, recognition becomes

¹⁵⁴ The authors used GAS to refer to the "scientists' habit of making the results of their research public" (Volonté et al., 2018, p. 319).

more difficult even when using one's own terms. Furthermore, when the gap and its impact is made implicit to 'fit in', as in the case of becoming a design researcher in HCI and disseminating design-led research within its science-based frameworks, the potentiality of design practice as a site of knowledge production is restricted. In the following sections, I'm going to propose further directions to address this research recognition gap.

8.1 Histories for design and research

I am not an historian, yet I had to construct my own narratives for how design research and HCI research came to be for the purposes of this thesis respectively in Chapter 2 & 3. I benefited from a wide range of sources for both narratives, as well as spending a lot of time tracing citations on scholarly databases. It became clear to me that because of the research recognition gap in design, the former is positioned disadvantageously against the latter: While constructing a narrative for how HCI research entailed making use of the already available resources on the topic¹⁵⁵ and spending a lot of time tracing citations on ACM Digital Library as the main scholarly database for HCI research, the other was a much more complex process. Constructing a narrative for how design research required having a wider range of resources at-hand, including personal anecdotes and experiences of mine and others, and being open to less common ways of collecting data, such as obituaries published online (e.g., see the footnotes in section 2.3.1).

Despite the abundance of emerging approaches to studying design from historical, sociological, political, ethical, cultural and ecological perspectives¹⁵⁶, there are not many resources that present how design

¹⁵⁵ I benefited a lot from Rogers' (2012) book titled 'HCI Theory: Classical, Modern, and Contemporary' and McCarthy & Wright's (2004) book titled 'Technology as Experience' for their comprehensive overview on the development of ideas and concepts in HCI. I frequently referred to the Interaction Design Foundation website and Wikipedia, too.

¹⁵⁶ For example, Julier et al. (2019) proposed 'Design Culture' studies as a means of negotiating the dispute between Design Studies and Design History based on Margolin's (1992) distinction of the two. Similarly, Gunn et al. (2013) introduced 'Design Anthropology' integrating the strengths of design thinking with anthropological research. Furthermore, there is a growing body of work that explore the relationship between design and power (Fry,

research came to be, except for somewhat anecdotal papers like that of Bayazit et al., (2004) and Margolin (2010). These two papers helped me put together the many, but scattered papers by the key figures that established design research in order to understand them as a whole. Despite the blurring of design specialisms (Bremner & Rodgers, 2013), constructing a narrative for how design research came to be often involved specifying the design domain (section 1.1.2): Design research is such a vague concept that exists across disciplines and can mean very different things in terms of its objects and approaches in each due to the claims for disciplinary design knowledge (e.g., as argued by Cross (2006) for industrial design; or Lawson (2006) for architecture). As a result, I had no choice but take a stance for the kind of design research as I've understood it due to my prior training and experiences (section 1.6). I was lucky that Bürdek (2005) had provided a comprehensive resource on the history, theory and practice of product design; which was particularly helpful for my writing of the section 2.1.

Overall, I had to stitch 'bits and bobs' from a wider range of resources on design, including design studies books that are not necessarily directly related to my topic of interest, and further adapt my scholarly database search strategies to the heterogeneity and 'softness' of resources on design practices. I was able to commit to this, because I have been personally invested in the value of design research, as well as for the research purposes, yet I have become increasingly aware that some forms of design research are more difficult to get to (section 7.5). It's not surprising that 'design entryism' in the research context is facilitated by the earlier, scientific ideas on design research rather than contemporary design research that offers increasingly critical perspectives on design¹⁵⁷ (section 7.1). As a result, those anticipating the value of design research and wanting to participate in it could potentially end up perpetuating the earlier ideas. Furthermore, where this is combined

2008; Fry, 2010, Fry, 2013; Fuad-Luke, 2013; Keshavarz, 2016; Canli, 2017; Escobar, 2018; Abdulla, 2018; Keshavarz, 2018; Bieling (2019) Contanza-Chock, 2020). Some of these ideas have consolidated in the 'Decolonising Design Collective' and their subsequent efforts (Schultz et al., 2018a; Schultz et al., 2018b; Abdulla et al., 2019).

¹⁵⁷ See footnote above.

with the structural barriers to the incommensurability of disseminating practice research in art and design within the science-based research frameworks, as in the case of HCI, it may even result in the governance of design (see Chapter 7).

This is why it's very important to address the research recognition gap in order to convey the true value of design research. It should not equate the value of design research with virtues in research integrity: Just as in any other research endeavour, there could be bad design research, as well as the good ones. We need to be able to assess these on their own terms in order to ensure the future quality of our research. For example, Tonkinwise argued that the practice-based design research in the 2000s had to adopt a “defensive insularity” in trying to live up to the epistemological claims made by early design research (2017, p. 29). Hence, justifying design research should not involve inaccurate knowledge claims, nor encourage individual design researchers to do so in order to cope with the collective precarity to their disciplinary positioning in academia (section 1.2.2). As I will be discussing in the following section, dissemination plays an important role in the production of knowledge for the future of design research, but it is the histories for design and research that can communicate the value of design research on its own terms. It can allow us to contextualise the endurance of certain ideas that may potentially conflict with the reality of design practices, understand and tackle them rather than dismissing them entirely.

Tonkinwise called for a “more honest history” to design’s inclusion in academia (2017), yet acknowledging the plurality of design practices (section 2.1.7), I call for histories than just one. Although design historiography is a subject matter for design history, there have been emerging approaches to relating the past of design to its present. Some of these include re-historicising design from a critical practice perspective (Rosner, 2018), from a conceptual and methodological perspective (Göransdotter & Redström, 2018; Göransdotter, 2020), or for pedagogical purposes (Nooney & Brain, 2019; Boling et al., 2020). Similarly, there have been calls to turn to design history within HCI (DiSalvo, 2014; Ghajargar & Bardzell, 2019). On the other hand, design history

itself is a discipline in flux (see Walker, 1989; Fallan, 2010; Atkinson & Oppenheimer, 2016 for example). Therefore, unless HCI and its means of governing design are explicitly discussed in terms of its implicit disciplinary concerns, the turn to design history may become yet another resource to extract information rather than truly historicising design (Tonkinwise, 2006). For example, in the following excerpt, Walker talked about design history, arguing for multiple and various histories of design, but I think it fits well for design research, as well as HCI research:

“What constitutes a discipline may be hard to grasp. It can be described briefly as the ensemble of assumptions, concepts, theories, methods and tools employed by a particular group of scientists or scholars. During the early stages of a discipline, most of these assumptions, etc., will be implicit and unconscious. When they become explicit the discipline attains self-awareness. Also, of course, disciplines are defined by the particular body of material or field of research they claim for themselves.” (Walker, 1989, p. 279).

As a result, design needs histories in order to explore, facilitate and enhance its ongoing transitioning into a site of knowledge production. Bremner & Rodgers also acknowledged “design’s poor historiography” as the reason behind its “position of not knowing what to project” (2011, p. 9), building upon Dilnot (2009). Perhaps because of this, the ongoing flux of design research is even more of a complex matter than that of design practices and their relationality to be studied as a whole. It’s likely that this is the reason why we lack a design research history. Moreover, scholarly design research further involves a flux in terms of its vocabulary, which is often taken for granted. For example, Melles (2008b) examined the fluidity of the meanings around ‘wicked problem’ in scholarly design research. Similarly in this thesis, I have demonstrated the fluidity of the metaphor of Probes in HCI (section 1.2.4) and how its increasing conceptual and methodological ambiguity has indeed served to pluralise design research in HCI, expanding the ascribed disciplinary boundaries of design in HCI (section 1.2.5).

I believe such micro-histories of design would also encourage a move away from the micro-politics of demarcating and disciplining design towards explicit

discussions of intentions and approaches to designing, research-ing, and theorising. Throughout this thesis, I emphasised that the notion of institutionalised research has been also responsive to the societal changes (section 2.3). Yet, it continues to create intellectual and ethical challenges for design researchers and become only apparent in highly sensitive settings that design researchers often find themselves working in for design's facilitation of the small politics of research (section 5.5.3). The politics of research in terms of its authority and purpose (e.g., the colonial origins of qualitative research) indeed require explicit discussions of why, as well as how. We need to consider the end of design theory, for theory can be a means of domination (hooks, 2014; de Sousa Santos, 2015), if not for instrumentalisation of 'the better', but then, whose better (section 2.2.1)? Creative research has resisted a formalisation even regarding its name in order to explore a broader range of possibilities to how practice can fit in academia (Prentice, 2000), risking becoming vulnerable to the interventions from the outside. Perhaps what design needs is not a methodology or theory as part of its academic legitimisation, but being given the chance to explain its value on its own terms. In the next section, I will talk about how dissemination of design research can further encourage that.

8.2 Dissemination of design research

8.2.1 Criticality in design

Historically, there have been biases against people who make things that they do not understand the politics of what they are doing, that they are not 'critical' enough (e.g., in Arendt's 'The Human Condition' (2013)). As a result, people who make things have been excluded from the process of finding and defining a problem to be solved. Instead, they have been included in the very last step of the process for their manual labour to bring a closure to the problem. Their reduced agency in the process continued to reinforce these biases against people who make things.

There are unsettling similarities to the historical biases against people who make things and the positioning of designers in early HCI design research

(section 3.2.1). Where design research was understood in limited terms as scientific research conducted to inform an end design in the form of ‘design implications’, designers were only included for the last step of the process: ‘design’. This exclusion was not only belittling for designers, but also diminished their agency over the design process. Hence, it significantly limited the potentiality of design for HCI research, which was considered to be the end product at the time, as well as for research. In section 2.1.5, I’ve talked about how the reduced agency of craftspeople resulted in their deskilling and the devaluation of their handiwork, leading to worsening working conditions for them. In doing so, I wanted to demonstrate the impact of scientifically managed division of labour and the subsequent reduction of practitioner agency on the collective future of their practices beyond the individuals. Most importantly, I wanted to show that it was not because craftspeople weren’t good at what they were assigned to do, but because they weren’t allowed to do more than that within the strict division of labour. This should have been our cue to emancipate ‘practice’ from the segmentation of academic labour.

On the other hand, Sennett (2008) told a different story about craftsmanship than what we have been made to believe. He reminded us that the reality behind this historical framing of craftsmanship as mere labour was much more than being a problem of craftspeople: It stemmed from the prioritisation of the mind over the body within the dualistic conceptions and the gendering of skills that historically devalued some crafts even more (Sennett, 2008). Therefore, critical thought was made into a criterion to demarcate the privileged from the rest in order to justify the subsequent actions to strip them of their agency rather than being thought to reside in everyone. Sennett further pointed out to the “nearly *instant* relation between problem solving and problem finding” (2008, p. 26, emphasis in original) and expanded the scope of craftsmanship from skilled manual labour onto a desire to do any job well for its own sake. In doing so, he aligned criticality closer to ‘care’ than as a means of oppression as before.

When Anthony Dunne & Fiona Raby conceptualised their work as ‘Critical Design’, their criticism targeted the conventional positioning of design in the

industry an “agent of capitalism” (Dunne & Raby, 2001, p. 59). They defined ‘Critical Design’ by its divergence from what they called ‘affirmative design’. Despite the ostensible level of agency in design professions, they argued that affirmative design lacked criticality in the way it “conforms to cultural, social, technical, and economic expectation” (Dunne & Raby, 2001, p. 58). In their framing, design was not about the problem solving or even finding, but questioning. Their criticism did not target professional designers nor aimed to devalue their work for lacking criticality, but acknowledged their boundedness to how industry ascribed a top-down role for designers. Hence, they argued that it was academic designers’ responsibility to use their privileged position to push the ascribed boundaries of design rather than perpetuating these industrial understandings of design (Dunne & Raby, 2001).

In fact, it becomes clear that Dunne & Raby’s argument for ‘Critical Design’ was directed at the academic design practices if we look at the state of ‘design research’ at the time. When design was included in the third-cycle education, the lack of prior research training and experience created structural challenges for grounding research in design practices (section 2.3). As such, it could even be argued that it wasn’t an all-benevolent inclusion for it left the newly-appointed design researchers to their own means without infrastructural changes to accommodate them. Therefore, Melles (2011) pointed out to the 3 main ways of tackling this problem in the early practice-based design research: The first approach entailed adopting industry-based research, where the research served the development of professional skills (Laurel, 2003). The second approach maintained an ‘affirmative’ conformity; albeit to the academic expectations than the industrial ones (Becher & Trowler, 2001). Durling criticised this approach where a “deep understanding of the nature of research is limited” (2002, p. 80). It was only within the third approach that the understandings of both practice and research were beginning to be creatively questioned, also rethinking the relationship between the two (Newbury, 1996).

When placed in this context, Dunne & Raby’s critique becomes more clear in its target. Rather than maintaining a top-down approach to design as in the early design research or conforming to disciplinary conventions embodied in

the first two approaches to early practice-based design research, Dunne & Raby sought a bottom-up approach to grounding research in practice. To put simply, 'Critical Design' was an invitation for designer-turned-researchers, saying: We are designers and we have been trained to design, design is our research language, so why don't we design to contribute to the domain of knowledge on our own terms rather than trying to fit into the traditional conventions of academia? This is my interpretation, but to clarify, the following excerpt is what they actually wrote:

"Rather than writing papers and seeking conventional academic approval, they could exploit their privileged position to explore a subversive role for design as social critique. Free from commercial restrictions and based in an educational environment, they could develop provocative design proposals that challenge the simplistic Hollywood vision of the consumer electronic industry." (Dunne & Raby, 2001, p. 65).

As Dunne & Raby continued to develop their approach and discourse¹⁵⁸, it became even more clear that they have reached a similar understanding of criticality similar to that of Sennett (2008): "The critical sensibility, at its most basic, is simply about not taking things for granted, to question and look beneath the surface. This is not new and is common in other fields; what is new is trying to use design as a tool for doing this" (Dunne & Raby, 2009). They pioneered and advocated for 'Critical Design', opening up possibilities for further critical approaches to design and design research. Yet, Malpass observed that it has become "overly self-reflexive and introverted, sustained, practiced, and exchanged in a closed community. By operating in this way, its usefulness as part of a larger disciplinary project is undermined" (2013, p. 334).

In both framings of criticality above, it becomes clear that the lack of criticality in any practice stems from the practitioner's reduced agency in decision-making than their capabilities for the endeavour in question. In creating overly-aestheticised objects and exhibiting them in art galleries, Dunne & Raby aimed

¹⁵⁸ Coming from an art school ethos, they often complemented their design their writings in the tradition of 'artists writing about their work'. I explained this in the footnote on 'theory industry' in section 7.3.

to subvert the biases against that reinforce the idea that one has to compromise on 'style' (or 'craft' in Don Norman's terms as part of his critique of design in section 1.2.3) for 'substance' in order to be intellectually respected. Hence, they made explicit references to art in describing their aim as "to make us think. But also raising awareness, exposing assumptions, provoking action, sparking debate, even entertaining in an intellectual sort of way, like literature or film" (Dunne & Raby, 2007). Their stylistic choices as part of their critical approach to design was not all that there is to criticality in design, yet came to form the base of the criticality discussions around design in HCI (section 7.1). Underlying these debates is an art-based understanding of design that locates criticality in the artifact and the discourse it creates (i.e., how they are interpreted through design criticism) rather than understanding the artifacts as outputs of an inherently critical practice (section 2.1.7). It indicates that we lack a culture of design and design research in academia, even within design research (section 6.5.4). This was also evident in Sennett's notion of criticality as follows:

"Getting things in perfect shape can mean removing the traces, erasing the evidence, of a work in progress. Once this evidence is eliminated, the object appears pristine. Perfection of this cleaned-up sort is a static condition; the object does not hint at the narrative of its making" (Sennett, 2008, p. 258).

Indeed, Dilnot argued that design starts with a critical apperception and is "the process of the realisation of these perceptions – these truths – into an actualised form" (2008, p. 179), which was also implied in Simon's famous definition of design (section 2.2.3). However, unlike Simon and his rationalised view of design process, Dilnot pointed out to the subjectivities involved in the process by further saying that design process entails translating them into "a composite synthetic configuration that is the realisation of these perceived truths (no matter how intuitive their origin) and the realisation of the critical truths of configuration." (Dilnot, 2008, p. 179). Dilnot was also aware of the dominant stance to design as operational or instrumental translations, where criticality was framed as if it was an 'option' or a 'luxury' despite being integral to design. Similarly, Tonkinwise argued that "[e]very time you qualify design with, or add design to, some other quality or practice, you are claiming that

design does not already do that” (2019, p. 13). For him, a wide range of design-led approaches¹⁵⁹ were all redundant and/or appropriative of design (Tonkinwise, 2019), indeed territorialising design rather than ensuring these qualities for all design practices (section 2.2.3). Keshavarz (2016) further pointed out to this ‘blindspot’ in Dunne & Raby’s framing of ‘Critical Design’ in binary opposition to ‘affirmative design’ by providing affirmative examples to criticality¹⁶⁰. According to Keshavarz, the instrumentalisation of design’s inherent critique was also evident in DiSalvo’s (2015) framing of ‘adversarial design’ as political design merely for its engagement with an explicitly political content: “An understanding of design as an inherently political practice points out that critiquing the content of the designed thing does not make design critical” (Keshavarz, 2016, p. 89). When criticality is presented as an end product rather than the “very state of being a practice” (Dilnot, 2008, p. 177) as in Keshavarz’ examples, it may be externalised and even isolated from the design practice. Such separation may even lead to the presumptions around being able to study criticality in the detached manner of early design research studies into design (section 2.2). Furthermore, design practices that fall outside these ‘critical’ practices may become increasingly conformist and infantilised. Hence, criticality may once again become a means of demarcating the privileged from the rest.

Indeed, these potential dangers can be observed in the HCI discourse around critical design, where Dunne & Raby’s initial critique of design’s intellectual positioning has been co-opted similar to the appropriation of ‘Probes’ and ‘Research through Design’. Despite the initial intentions to challenge and expand HCI’s existing understandings around design research at the time,

¹⁵⁹ For example, Critical Design, Speculative Design, Adversarial Design, Ludic Design, and even Design Probes to name a few.

¹⁶⁰ Keshavarz (2016) argued that forged passports are an example of affirmative criticality rather than a negating one as Dunne & Raby’s formulation of critical design. He explains: “It criticises through the affirmation of the ways the passporting regime works. This can be seen as a sort of ‘affirmative criticality’ to borrow Dilnot’s (2008) term. This affirms that the freedom of movement facilitated by forged passports is a material critical practice because it produces its own space of functioning by refusing to engage in the legal space that is dominant and hegemonic. In fact, it affirms that despite states’ attempts to totalise and monopolise the space and time of governance over mobility, there will always be spaces left, or spaces produced that escape from such governance” (Keshavarz, 2016, p. 213).

'Critical Design' got "absorbed into the disciplinary orthodoxy through the shared efforts of theorists, commentators and practitioners" (Malpass, 2013, p. 335). In line with Dilnot's concerns, criticality in design was first made into an option in HCI as a domain of methodological expertise within RtD approaches that one can choose to engage with (Bardzell et al., 2012). Then it was questioned in terms of its potentiality to become a methodological approach (Bardzell & Bardzell, 2013). Malpass (2013) argued that the strict para-functionality of Dunne & Raby's Critical Design objects questioned the designers' role within the broader context of design, but only when supported by a narrative of use that contextualised their contingent critique through performance. In this sense, the knowledge that can be generated from Critical Design objects are strictly situated, even through the means of 'design criticism' (Bardzell; 2011; Bardzell et al., 2014; Bardzell et al., 2015; Pierce et al., 2015).

On the other hand, HCI's appropriation of designerly concepts and approaches has an underacknowledged benefit to the development of design discourse as this research aimed to demonstrate: By extracting and bringing in these concepts and approaches into HCI, they help normalise the 'designerly' in HCI, attracting more people to engage with design research. For example, the progression of the discourse on criticality already started expanding the notion of criticality in design in HCI (Pierce et al., 2015). The appropriation provokes design researchers' engagement in the discourse and encourages further 'designerly' interpretations and appropriations of the concepts. That indeed enabled me to consider Probes as a case study to understand design research in HCI (section 4.2). Either way, it is the design research that wins by expanding its scope and visibility in HCI beyond rational approaches towards expressing its value on its own terms, with style and substance.

8.2.2 Production of knowledge in dissemination

Dissemination of research is about articulating the outcomes of the knowledge production for advancing collective knowledge. In putting the emphasis on

knowledge production rather than research in the title of this thesis, I aimed to draw attention to this production process more than the outputs themselves. Indeed, Strathern argued that “self-consciousness about ‘knowledge’ is a tool for knowledge making. Reflections on the academic contributions of a thesis should, therefore, also reflect on what is meant by ‘knowledge’ and how this knowledge is produced” (2018, p. 64). In doing so, we may be able to distinguish knowledge from knowledge claims both in the dissemination and evaluation, the tacit from the unspoken (Mareis, 2012).

The ways to tackle implicit knowledge involved in design are different to tackling the structural challenges that result in making implicit of knowledge or deliberate obfuscation of the knowledge claims. For example, many of the design researchers participating in my interview studies expressed concerns about the success narratives that have been the norm in HCI research narratives that conflicted with their designerly willingness to invest in the uncertainty of the process, un-learn, try & fail¹⁶¹. In line with Howell et al.’s (2021) call for rethinking failure, they suggested that more of ‘failure stories’ around Probes can help normalise other research narratives in HCI, as well as provide chances to create new learnings for themselves and others (section 6.5.3.2).

However, I should make a note here that these learnings would not always be ‘knowledge’ in the scientific sense but help contextualise and situate it. For example, in section 6.5.4.2, it was suggested that it was potentially more appropriate to discuss failure stories behind Probes at special conference tracks than writing papers about those. In this way, all the Probe ‘trials’ could be displayed and discussed in terms of the reasons why they failed to share design know-how, e.g., materiality, technical problems, as well as institutional reasons, like running out of resources. I believe when all the work that goes into making of Probes or any other designed research artifacts are made visible, designerly challenges like that of Andy and his team would be less

¹⁶¹ For example, see the comments by design researchers throughout section 5.5.1, 6.5.1, 6.5.3.2.

likely to be approached with hostility (section 6.5.4.1), but more with curiosity and perhaps, respect for the labour behind them. In a way, Probes would continue to humanise research beyond humanising participants (Graham et al., 2007).

As I've demonstrated throughout this thesis, research dissemination in HCI entails different levels of conforming to its scientism, willingly or unwillingly, and sometimes perhaps subconsciously. Any effort to tame design research historically or methodologically are manifestations of scientism. It is another way of knowing that science, yet non-scientific is often associated with 'pseudoscience' and things that are not ways of 'knowing'. Methodology is often a means of demarcation, yet the idea of methodological continuity is often understood in very narrow terms. Boudry (2020) pointed out that despite the contrived contrast to the institutionalised science and its methods, these 'other' ways of knowing are still most of the time based on empirical observations, generating and testing hypotheses, using logical inferences, which are not too different than the ones being used in science. In this case, all valid modes of knowing, including the humanities, are continuous to each other methodologically, to be deemed 'rubbish' only when they are completely detached from the broader understanding of scientific research methodology as in the case of fortune-telling (Boudry, 2020). So, when talking about 'other' ways of knowing, we are indeed talking about 'other' ways of researching than what 'scientific method' or much narrower understandings of scientific research methodologies imply.

It's likely that HCI's ascribed scientism is often induced by material limitations rather than problems within its researcher community. Throughout this thesis, I exemplified how material world actively takes part in the shaping and development of ideas. I also showed that HCI's science-based research frameworks cannot accommodate disseminating these other ways of research-ing on their own terms, especially its artistic, practice-led forms. However, this is not a unique problem to HCI: Translating these other ways of knowing into the conventional means of knowledge transfer is difficult in many other settings, too. For example, Malpass (2013) expressed concerns about the oversimplification of the Critical Design movement, where the

dissemination of objects may involve “short, digestible captions and in some cases misrepresented and lacking scrutiny”, like in art galleries or magazines (Malpass, 2013, p. 335). Therefore, analysing critical designs in the HCI research context (Ferri et al., 2014) at first may seem slightly better in terms of scrutiny and length. Yet, is it enough to articulate the criticality that is the very practice of design (Dilnot, 2008)?

The incommensurability of practical knowledge and academic research frameworks that have been shaped by the sciences does not mean that we need to give up on this way of dissemination altogether. There’s still a lot of value to a research paper on a practice-based design research, there’s still a lot we can say, share, and learn from. However, my argument is that it may not be the only or the supreme way to disseminate these other kinds of research. Although some stances to artistic research argue against any kind of academisation to remain ‘true’¹⁶² artistic research and “an alternative culture of knowledge”, Borgdorff pointed out to the caricaturised view of academia in those views (2012, p. 5). Academisation can mean many things and if we are talking about practice as a site of knowledge production, academisation is necessary, but it matters how. Similarly, Tonkinwise stated that practice-based design research “should not just be a higher order form of conventional design practices” nor “be a more strategically applied form of research” (2017, p. 38). Despite the common tendency to think in binaries, it does not have to be one way or the other.

Moreover, if design research is often conducted with and for people, relying heavily on their input for research, so why shouldn’t be its dissemination, too? Tonkinwise further suggested other ways of disseminating for these other ways of research-ing, saying practice-based design research “must always

¹⁶² I stated that Probes started demarcating ‘true’ design in HCI in section 1.2.5 and strategically looked for ‘designerly’ in participant screening and recruitment as I’ve explained in section 4.1.2 on the basis of designerly tendency for criticality and interdisciplinarity. In other words, it was not about the background but rather about my subjective effort to demarcate good Probes from bad Probes for I wanted to bring in creative and critical perspectives into the interview studies. I also explained in section 4.2.1 that I made provisional boundaries to the case of Probes for the purposes of this research, but argued against demarcating design in section 7.1.

also involve articulating its experiments to a wide range of people and not speaking only to other expert practitioners” (2017, p. 38). There can be many ways to do that. For example, out of the design researchers I’ve interviewed, Jeanette Bell included her participants in the paper writing process to give them credit for their input and control over the research narrative. Similarly, Doenja Oogjes shared research outputs and further discussed the proposals with her participants even after the ‘research’ was done. She also mentioned that pictorials, while devalued in HCI research, was perceived as a respectably scientific research output by their participants (section 6.5.4.2). Many of these design researchers have used Probes to create and maintain conversations, further debate, and perhaps change, too. This was especially the case for longitudinal Probe studies by some of my interviewees, who did not necessarily label their work as Critical Design or created artistic objects.

As of today (January 16, 2023), Frayling’s (1993) RtD paper has 2359 citations, whereas Gaver et al.’s (1999) Probes paper has 2832. It’s likely that many of these citing publications have not explicitly articulated the reasons how and why they needed to reference these key texts. It’s likely that they are mostly signposted for a kind of justification and legitimisation without an interpretation of the concepts proposed in these texts. Indeed, citational analysis reveals the uncritical engagement with some other key design texts; e.g., Beck & Chiapello’s (2018) citation analysis of how DRS publications engage with Schön’s legacy, Chivukula & Gray’s (2020) citation analysis of Bardzell’s ‘feminist HCI’ legacy. Discourse has a memory that is often reinforced and advanced through the use of citations and references. Especially for the two papers, Frayling’s and Gaver et al.’s, where the material histories of how they came to be are as important as the ideas contained in these papers, the knowledge is produced in the way we interpret and engage with these ideas rather than the ideas themselves. Therefore, we need to diverge from the “citational path” that do more to demonstrate that we know of the field’s dissemination habits (Ahmed, 2019, p. 168).

8.3 Future work

In this thesis, I've explored the macro-politics of design research (see Chapter 2) and micro-politics of design research in HCI (see Chapter 7). In doing so, I drew parallels between how the expansion of both research domains made their unresolved issues implicit, yet continued to work in the background. Similarly, I aimed to demonstrate that a top-down approach to design, whether to 'discipline' or theorise on it, does not do justice to the plurality of design practices. As a result, I'd like to offer to meet in the middle, between the top-down structural changes and bottom-up individual practices to tackle our disciplinary anxieties and concerns.

First of all, I understand the goal of the disciplinary project of design as a way to lower the entry barriers into design. For example, the Ulm model's efforts to theorise on design was to facilitate knowledge transfer in teaching design (see section 2.1.3). Similarly, the conception of design research aimed to make design know-how portable for applicability in its underlying goal to divide and conquer the many problems of a post-war Europe (see section 2.2.2). So, the ultimate goal of this disciplinary project was indeed societal progress, albeit top-down. When I call for a critical stance on the disciplinary project of design, I am not talking about dismissing it altogether, but encouraging ways to understand how and why this project emerged in its particular time and context. If the goal is to make design know-how accessible for more bottom-up ways of designing, then the solution should not involve 'design entryism' (see section 1.3.1, section 7.1) that depreciates this know-how in all its contexts, but explore more participatory approaches to design and research and new modes of knowledge production (see section 2.3.2).

Design researchers employ individual strategies to counteract the impact of design's problematic sense of disciplinarity. Some of the knowledge and practices around Probes were made implicit in order to navigate the politics of research dissemination in HCI. In section 6.5.1, I've detailed that the ambiguity of the literature on Probes was intentional rather than indicating a lack of rigour; not with the intentions to gatekeep design know-how, but to bypass scientific framing of Probes as a method. Citational practices not only helped

position oneself, but also helped form the invisible colleges of design research. Design researchers chose to stay close to their networks as such, not for exclusivity, but to introduce some form of coherence towards developing a 'program' within the plurality of design research practices. Some even initiated collective efforts to reclaim designerly concepts against their appropriation through entryism, as in the example of RtD conference series (see section 1.2.2). However, the impact of these efforts remain limited without a structural change to support their underlying goal of sharing the value of design research.

Similarly, the governance of design in HCI stems from design's problematic sense of disciplinarity. The rapid expansion and the following fragmentation of the originally multidisciplinary HCI brought with it a regimented division of intellectual labour in this domain of academic research (see Chapter 3). We have seen how the division of labour in industrial production resulted in reduced agency of industrial designers (see section 2.1). It has been argued that the regimentation of academic disciplines result in disciplinary decadence, where knowledge production is turned into a matter of power and domination before serving public benefit (see section 7.2). When fitting design into the science-based research frameworks of HCI with a top-down approach, the critical aspects of design's historically problematic disciplinarity are neglected due to the research recognition gap. Despite the underlying goal of introducing designerly concepts to the field and encouraging their widespread use, imposing this kind of disciplinarity on design-led knowledge production brings disciplinary decadence for all. It ultimately forces design researchers to engage in ill-fitting practices, ranging from the adoption of (quasi-)scientific language, research narratives, citational practices, or even intentional obscuring (see section 6.5.1 and 6.5.2). Without a structural change to support design's accommodation in the field of HCI, design will continue to be a disciplinary outsider to be included. The devaluation of pictorial in HCI, despite initially being an effort to explore alternative formats and processes for disseminating design-led research, is an example to this (see 6.5.4.2).

So what are these structural changes we need rather than relying on the efforts of individual design researchers trying to make change happen? Certainly, it's not up to me to decide on these alone, but I can indicate some points of departure. We can start by conducting more studies into the contemporary issues of our 'discipline'. We can reconsider our dissemination and archival practices to push for ways to make knowledge production processes more accessible and assessable towards alleviating the research recognition gap. If design is inherently collaborative and critical as often argued, we can use it to facilitate more mutual exchanges between disciplines and embrace new forms of disciplinarity in the face of increasingly complex problems. Similarly, we can engage more with theoretical studies into design, such as design history as a field, not only to draw lessons from the past, but also to ensure theorising from, through and for practice. As I've mentioned throughout this thesis, theory, method, methodology may mean and function quite differently for disciplines outside the traditional sciences, and especially for practice research. Last but not least, we need to explore and articulate our situatedness in the structure of Design Research that confines us within the limits of disciplinarity. Instead of relying on knowledge that was produced as part of the disciplinary project of design to justify our design research practices and then having to deal with their historical baggage, we should focus on research as a means of knowledge production and how design can enhance that. Becoming a design researcher can and must transgress Design Research.

8.3.1 Value of design research: Utility or criticality

Throughout this thesis, I implied the impact of 'utility' in regard to the notions of design, research, and knowledge. The value of design research is often linked, and sometimes confused with, the concerns with its utility. This can be especially observed in HCI, which is increasingly becoming a design field than a domain of computing research. It extends a functionalist design ideology onto design research, equating utility with its value (section 2.1). On the other hand, utility concerns can be particularly harmful to critical thought, which should be flourishing at the universities and further engaging citizens. Therefore, we need to address the issues presented in section 8.2.1, through

policy change to research frameworks, research community-building efforts, and developing some kind of code of conduct for design research and providing the necessary training for those wanting to engage with design research. Given the institutional differences and heterogeneity to design research, we need to start local. On that note, Strathern wrote:

“A discipline’s success becomes defined in terms of how well it produces or performs its relational potential. Making responsiveness relevant is to assume that responsiveness only gives evidence of itself when its use can be shown by those on whom it has impact. Interdisciplinarity becomes a tick-box qualification for a grant.” (Strathern, 2005, p. 103).

There are several other things we can start practicing right away, wherever we are, regardless of approaches to design in order to mitigate the research recognition gap and encourage criticality in design research. We may start by rethinking criticality in our own work to consider the relationality, complexity and uncertainty of design. For each design research project we engage in, we can articulate these aspects in the publications and encourage others to do the same. Design’s relationality entails ontological concerns ranging from the more abstract questions to the more concrete: What is design and how can I articulate this *through* design in this project? For example, choosing to use conventional terminology like ‘design problem’, ‘problem-solving’ and ‘design knowledge’ convolutes what could be potentially articulated without the use of jargon. Even by articulating that it cannot be articulated, we would be articulating something about design. Similarly, if we acknowledge and indeed embrace design’s interdependency on other disciplines to ground its knowledge claims beyond ‘design knowledge’, we may be able to look past the concerns for legitimising design research through theory. The idea of undisciplined (design) researcher (Rodgers & Bremner, 2013) is already evident across writings of many scholars on different aspects of design, e.g., Findeli (2001), Tonkinwise (2017), Pizzocaro (2018), arguing for design and practice research’s capacity to exist outside the conventions of disciplinarity. Perhaps it’s time we give back to the fields we’ve been borrowing from, in the similar manner design researchers use Probes to give something back to their participants.

Furthermore, we need to acknowledge that all design problems are wicked to ensure criticality in every design practice, regardless of its approach, concern, discipline. Complexity needs to become more than a buzzword in our publications and start becoming a part of them through a consideration for the future consequences (Sturdee et al., 2021) and the situated nature of design knowledge amongst many more ways forward towards different configurations to disciplinary approaches to knowledge production. The different levels of uncertainty of design needs to be accommodated in the publications rather than made implicit (e.g., uncertainty of use, uncertainty in participant engagement with Probes, uncertainty of knowledge to name a few). Currently, there are not many ways that enable design researchers to express the uncertainty of the design process, of not-knowing what could be known, in HCI. The intentional conceptual muddying of Probes is amongst the few ways of managing the uncertainty of the design research process, despite the difficulties it initially creates for the design researchers to get started with them (section 6.5.1). As a result, publications often happen after a project ends and gets post-rationalised to report on the findings and contribution. How we got there, from not even knowing what to know to knowing something, is the key to sharing design's tacit knowledge, yet the least articulated in the contemporary dissemination practices within HCI. What would be different if we were able to report on a project from early on? Perhaps we would receive feedback from a broader research community than merely our own support networks or get a chance to collaborate with people interested in or already working on the topic. Moving beyond insularity towards building a community, we would ensure a higher level of criticality in design research.

The emergence of critical thought in discursive practices has created a lasting impression that often equates it with deconstructive questioning, yet it can be constructive or 'affirmative' in design, as Keshavarz (2016) argued. It can be equally about maintaining as it is about mobilising change through disruption, innovation, or subversion. That is because criticality originates from a place of care (de la Bellacasa, 2017). Critical thought is the quintessential situated knowledge, for it cannot be abstracted nor separated from its knower

(Escobar, 1992). Acknowledging and then addressing the invisible work by design researchers is only one of the ways we can maintain critical thought: If we can't care for that kind of knowing, we can care for its knower. We need to start thinking about the ways we can foster a culture of design and design research in academia (section 6.5.4) rather than relying on the capacities of individual design researchers to cope with the 'burden of proof', which varies across institutions and design research contexts. It's an indirect way of ensuring the value of design research, for it acknowledges that the current state of design research is contingent to the financial, social, and cultural capital existent within the institutions, hence in direct relation to privilege. Throughout the process of participant screening and recruitment, I've become more aware of the inherent Eurocentricity of design research¹⁶³.

Probes often entail more invisible work than what goes into its materiality, for example, emotion work. Probes are valued and often used for their capacity to show care and inquire into the increasingly personal and sensitive settings of technological design in much gentler and thoughtful ways than conventional research methods (see Chapter 5). As part of the qualitative research they're used for, Probes prompt reflexivity in a similar manner to psychotherapy, yet design researchers are not trained as therapists nor should be (Hirsch, 2020). This emotion work is often underacknowledged in the publications due to HCI's underlying 'science lab' understanding of fieldwork as formalised and detached 'user studies' (section 3.1). Where working with marginalised or vulnerable communities using Probes, it's important to maintain boundaries for the researchers' safety, as well as that of the participants.

Unless we start talking about the emotion work that's often made implicit in the citational references to Probes, we are risking the integrity of the research and the safety of those taking part in it, for design researchers are often ill-prepared

¹⁶³ There are also language barriers, even within Eurocentric contexts of design research. For example, German and Italian design discourses remain rather introverted due to their development in their native languages. Design research has originated in the UK and HCI research originated in the US, both of which are English speaking countries. Does this mean English should be the de facto language of design discourse?

to engage in this kind of emotion work (Balaam et al., 2019). Leaving Probes behind, as often emphasised in the discourse to describe the way they are used, does not mean they are exempt from these issues. Future work should tackle these problems, first by acknowledging those in dissemination and then providing the necessary actions. These include providing infrastructural support such as training and supervision for the fieldwork (Birch & Miller, 2000) rather than leaving design researchers to their own means once again (section 2.3.1).

8.3.2 Dissemination and archival

Double-blind peer review processes in HCI creates an imbalanced power dynamic to the review processes, where the submitting authors can be somewhat identified due to the personal nature of design-led work (section 6.5.4.2). As such, peer review can be a means of enforcing disciplinary orthodoxy or gatekeeping rather than ensuring fair judgment (section 7.4). There are several ways we can go about this based on this research.

Firstly, we can acknowledge the personal nature of design-led work and situatedness of practical knowledge and try to develop new platforms and approaches to disseminating RtD and practice research (Durrant et al., 2015; Chen et al., 2017; Chen, 2019). Secondly, we can extend 'peer review' onto stakeholders as well as disciplinary peers in line with the accountability concerns of mode-2 knowledge production (Borgdorff, 2012; Tonkinwise, 2017). In terms of HCI's concerns for relevance to the industry practices, industry practitioners can be invited into extended peer review processes and further connections can be built more organically than trying to close the theory-practice gap with a top-down approach.

Thirdly, we can modify the existing dissemination structures and make them open to reviewer feedback and further development, as in the example of 'Journal of Artistic Research' (JAR) (Borgdorff, 2012). For example, in alt.chi, the un-anonymised commentary gets published along with the publication. In evaluating and archiving the publications that way, it is not a matter of

convincing reviewers to get in anymore, but a dialogue that invites readers to join in. It potentially ensures a fairer judgment than gatekeeping. I've mentioned the element of luck in the assignment of the reviewers in HCI venues, especially in CHI (section 6.5.1.2), which impacts the quality of submissions as well as the reviews. In de-anonymising and publishing the reviews alongside accepted publications, the design research community in HCI can further evaluate the review and the reviewers' suitability for the submission. Alternatively, if reviewers are to remain anonymous, they can self-assess their suitability for the submission and guidelines for reviewers¹⁶⁴ can be provided to ensure quality of reviews, as in the example of JAR above. In the longer term, these can help identify different domains of expertise within the community.

In order to tackle the archival-related problems around design research in HCI, several suggestions were made by the design researchers taking part in the second study (Chapter 6). First of all, shared archival around Probes could be developed into resources for practice-based design research. In the first study, when asked if I could see their Probes, most of my participants could only show the documentation on their Probes rather than the artifacts themselves. There were few exceptions, where design researchers literally took their Probes out of big, archival boxes after they served their purpose of administration. This was the basis to Hann's (2015) argument and call for a second wave research culture for practice research. She argued that where practice knowledge was locked into boxes and obscured, knowledge claims were not subjected to healthy evaluation but suspicion by disciplinary peers, as well as disciplinary outsiders (Hann, 2015). The same concerns are valid for especially practice-based design researchers, where their work is met with suspicion in the science-based research frameworks of HCI, sometimes even met with hostility (section 6.5.4.1). Documenting and archiving Probes

¹⁶⁴ For example, criticality in design research can be further developed into a guideline for reviewers. However, I am wary that guidelines should be open-ended in order to avoid their absorption into tick-box culture or uncritical uptake as templates as it tends to happen in HCI.

alongside the publications would not only supplement the publications, but strengthen their argument, too.

Other suggestions for archival included 'annotated papers', where researchers can curate and inter-link related papers on the database, as well as include commentary to provide context for the papers and the projects they were talking about if there was any. Design research often takes place with several stakeholders and co-authors, therefore a project can be disseminated in several outputs for its different aspects. These details that are crucial to understanding design research in HCI, but not included in the stand-alone publications, can help a research like this one in understanding how and why design research comes to be. It would also give researchers a chance to revisit their previous work in the light of their future learnings. In explicitly re-evaluating and discussing their publications, the ongoing life of the publications, therefore the ongoing flux of design research would be emphasised rather than understanding them as the final say.

Finally, given my experiences on navigating the scholarly databases, we may also need to develop and follow consistency in indexing research on the platforms we use. For example, Clemons & Eckman (2004) discussed the importance of indexing to the development of the discourse for interior design. At this point, I am wary of the different perspectives on formalising names and terminologies and I acknowledge the value of keeping it as it is. However, I also believe we need to look for ways in-between what we want to do and what we could do. Alternatively, we can supplement and/or modify our current ways of dissemination in creative ways that would fit us rather than having to fit in. As designers, these are not far from what we are known to be good at; relating, negotiating, facilitating, translating, provoking, initiating, amongst many more. It's time we unite design and research on their own terms this time: It's a match made in heaven!

9. References

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Appendices

Appendix A: Study I materials

A.1 Participant information sheet



**Northumbria
University**
NEWCASTLE

Probing into Research through Design

Participant Information Sheet

You are being invited to take part in this research study. Before you decide it is important for you to read this leaflet so you understand why the study is being carried out and what it will involve.

Reading this leaflet, discussing it with others or asking any questions you might have will help you decide whether or not you would like to take part.

What is the Purpose of the Study

This study aims to obtain insights on the diversity of practices surrounding (design) Probes in RtD activities. It will supplement a broad systematic review of Probes by providing insights into the lived experiences of making and deploying them.

Why have I been invited?

Because you are a design researcher who have used Probes in at least one of your past projects and published about it, mentioning Probes/probing either in the title, keywords, or body text in reference to Gaver et al's Cultural Probes (1999).

Gaver, B., Dunne, T., & Pacenti, E. (1999). Design: cultural probes. *interactions*, 6(1), 21-29.

Do I have to take part?

No. It is up to you whether you would like to take part in the study. I am giving you this information sheet to help you make that decision. If you do decide to take part, remember that you can stop being involved in the study whenever you choose, without telling me why. You are completely free to decide whether or not to take part, or to take part and then quit the study before completion.

What will happen if I take part?

If you are located within the UK: You will be asked for an in-person interview by the researcher in your workplace or another location of your choosing. You will receive an outline of the interview questions once the meeting date is set, giving you at least a week to reflect upon them. Upon meeting, you will be asked to sign a consent form that you agree to take part in the study. The principal investigator will then interview you on these questions about your previous use of probes and your design background. The interview is expected to last about 90 minutes. The session will be audio recorded and photographs of your workplace, project and probing work may be taken.

If you are located outside the UK: You will be asked for a Skype interview with the researcher. You will receive an outline of the interview questions once the interview date is set, giving you at least a week to reflect upon them. You will be sent a consent form that you agree to take part in the study via e-mail, and you will be asked to sign and deliver it to the principal investigator before the Skype interview. You will then be interviewed on your previous use of probes and your design background via Skype (or equivalent) on the arranged date. The interview is expected to last about 45-60 minutes. It will be audio recorded.

What are the possible disadvantages of taking part?

If your previous Probe work was deployed as part of a confidential project or with vulnerable participants, you need to ensure protection of their privacy yourself and not provide more information than you should.

You can always contact the principal investigator after the interview and share your concerns if you have any. The contact details are provided at the end of this document.

Will my taking part in this study be kept confidential and anonymous?

You and your work is already known to the research community, but for this study, you will be given the default option to be anonymized. If you prefer, you will be explicitly credited in the study. All audio recordings will be transcribed by the principal investigator, and if you request anonymization, the transcripts will be given a unique identifier, which will match an anonymized participant identifier. If taken any, photographs will not include identifying features of participants.

How will my data be stored, and how long will it be stored for?

I will use a portable hard drive and store the data encrypted in it. The hard drive will be physically locked away and stored in a cabinet to which only I and my supervisors have the key.

All audio recordings will be transcribed by the principal investigator, following which the original audio recordings will be destroyed.

All other information and data gathered during this research will be stored in line with General Data Protection Regulation and will be destroyed 36 months following the conclusion of the study. If the research is published in a research journal it may be kept for longer before being destroyed. During that time the data may be used by members of the research team only for purposes appropriate to the research question, but at no point will your personal information or data be revealed. Insurance companies and employers will not be given any individual's personal information, nor any data provided by them, and nor will we allow access to the police, security services, social services, relatives or lawyers, unless forced to do so by the courts.

What categories of personal data will be collected and processed in this study?

Data collected will include audio recordings from interviews, and photographic documentation of participants' work if the interview takes place in-person.

What will happen to the results of the study and could personal data collected be used in future research?

The general findings might be reported in a scientific journal or presented at a research conference, however the data will be anonymized and you or the data you have provided will not be personally identifiable, unless you to be explicitly credited. The findings may also be shared with other organizations/institutions that have been involved with the study. We can provide you with a summary of the findings from the study if you email the researcher at the address listed below.

Who is Organizing and Funding the Study?

Northumbria University

Who has reviewed this study?

The Faculty of Arts, Design and Social Sciences Research Ethics Committee at Northumbria University have reviewed the study in order to safeguard your interests, and have granted approval to conduct the study before this study could begin.

What are my rights as a participant in this study?

Your rights under GDPR include:

- A right of access to a copy of the information comprised in their personal data if you submit a [Subject Access Request](#);
- A right in certain circumstances to have inaccurate personal data rectified;
- A right to object to decisions being taken by automated means.

If you are dissatisfied with the University's processing of personal data, you have the right to complain to the Information Commissioner's Office. For more information see [the ICO website](#).

Contact for further information:

Principal Investigator Sena Çerçi: sena.cerci@northumbria.ac.uk
Principal Supervisor John Vines: john.vines@northumbria.ac.uk
Research Ethics Director Mark Blythe: mark.blythe@northumbria.ac.uk
Data Protection Officer Duncan James: dp.officer@northumbria.ac.uk

A.2 Consent forms



**Northumbria
University**
NEWCASTLE

CONSENT FORM

Project Title: Probing into Research through Design

Principal Investigator: Sena Çerçi

*please tick or initial
where applicable*

I have carefully read and understood the Participant Information Sheet.

I have had an opportunity to ask questions and discuss this study and I have received satisfactory answers.

I understand I am free to withdraw from the study at any time, without having to give a reason for withdrawing, and without prejudice.

I agree to take part in this study.

I also consent to the retention of this data under the condition that any subsequent use also be restricted to research projects that have gained ethical approval from Northumbria University.

Signature of participant..... Date.....

.....

Signature of researcher..... Date.....

.....



**Northumbria
University**
NEWCASTLE

**FOR USE WHEN PHOTOGRAPHS/VIDEOS/TAPE RECORDINGS WILL BE
TAKEN – IN-PERSON INTERVIEWS**

Project title: Probing into Research through Design

Principal Investigator: Sena Çerçi

I hereby confirm that I give consent for the following recordings to be made:

Recording	Purpose	Consent
project photograph	to convey the materiality of the probes	
voice recordings	to transcribe and analyse to understand the use of Probes	

Signature of participant..... Date.....

.....

Signature of researcher..... Date.....

.....



**Northumbria
University**
NEWCASTLE

CONSENT FORM

Project Title: Probing into Research through Design

Principal Investigator: Sena Çerçi

*please tick or initial
where applicable*

I have carefully read and understood the Participant Information Sheet.

I have had an opportunity to ask questions and discuss this study and I have received satisfactory answers.

I understand I am free to withdraw from the study at any time, without having to give a reason for withdrawing, and without prejudice.

I agree to take part in this study.

I also consent to the retention of this data under the condition that any subsequent use also be restricted to research projects that have gained ethical approval from Northumbria University.

Signature of participant..... Date.....
Signature of researcher..... Date.....



**Northumbria
University**
NEWCASTLE

**FOR USE WHEN PHOTOGRAPHS/VIDEOS/TAPE RECORDINGS WILL BE
TAKEN – SKYPE INTERVIEWS**

Project title: Probing into Research through Design

Principal Investigator: Sena Çerçi

I hereby confirm that I give consent for the following recordings to be made:

Recording	Purpose	Consent
Video recording	Only the audio will be used for transcription and the latter analysis to understand how Probes were used. The relevant video excerpts where Probe materials may be shown will be used only for reference by the researcher and will not get published anywhere.	

Signature of participant..... Date.....

.....

Signature of researcher..... Date.....

.....

A.3 Invitation e-mails

E-mail Subject: Interview request on Design Probes for PhD study

Attachments: Participant Information Sheet

Hi [Name],

I am a PhD student in Northumbria School of Design (UK) working with John Vines (cc'd), studying how Probes generate knowledge within Research through Design practices. As part of my PhD studies, I am conducting interviews with design and human-computer interaction researchers to understand why and how Probes have been used in their research. I am especially interested in understanding the practices surrounding Probing - in particular how Probes themselves are made, and why they have been made in specific ways.

I am getting in touch with you because you have published on Probes and used them in your research. If you're happy to do so, I would like to interview you about your use of Probes, discussing why you used them, why you made them as you did, and what you feel you learned from using them in your projects.

The interview could be via Skype or similar. It is estimated to take no longer than 60 minutes and will be audio recorded. It would be great if we could also take a look at your actual Probes or visual documentation of them. I've attached the information sheet, should you be interested in knowing a little more. If you agree to take part in this study, I will provide the consent form at least a week in advance before the interview.

I look forward to hearing back from you - and if you have further questions, please do not hesitate to contact me from this e-mail address. Thank you for your time.

Kind regards,
Sena Çerçi

A.4 Interview guide

Introduction, Briefing and Consent

S: I am a design researcher working on Probes. You've been selected and contacted because you've worked with and published on Probes. ...

S: Please tell me about yourself, your current work and your background as a researcher. How did you end up here? What areas have you worked in?

[Byproduct: focus on Probes, the rest is byproduct.]

S: Of course I'm here because I want to talk to you about probes in your research. So, what does a Probe mean to you?

Enabling reflection on their use of Probes and their paper

S: Could you talk me through your use of Probes for [project] which you've talked about in [paper citations]?

S: Why did you choose probes as a technique for this project?

S: Was this your first time using Probes? How many times have you used Probes before?

S: How did you make decisions about how your probes were designed:

S: What did they look like? Why did you make them look/feel/sound like that?

Deployment:

S: Could you tell me about how you introduced your Probes to your participants?

S: Who were your participants?

S: How did your participants react on first being given the probes?

S: How long were they with the participants for?

Probes after use

S: How did participants return the probes to you if they did at all?

S: Did participants engage with them in ways you expected, or unexpected?

S: How did you feel about your probe returns? How did your participants feel about your Probes?

S: Did you or your participants keep the Probes? What was their value to you?

S: How did Probes engage you with your participants?

S: How did you interpret the Probe outcomes? Who was involved?

S: How did what you learned from the Probes influence the following parts of the project?

S: Do you think using these Probes led to insights that you could have not learned through other approaches or techniques?

Post-project

S: What happened to these Probes after the project? Did you use/refer to them for another project/paper/work? Are they still in use? Are they bespoke (one time-off)? Did you reuse these or elements of them at all?

S: Is the project ongoing? Are you still engaged with your participants? How so?

Probes and knowledge & reflexivity

S: What did you learn about Probes through the experience of deploying them? Did “learning by doing” change your understanding of Probes?

S: Outside of what was learned for the project, did you learn anything else through using these probes – i.e. skills, knowledge etc.

S: What were the challenges in working with probes?

Probes over time

S: If this project was to take place today, would you use Probes again? How would you use them? Would you do anything differently?

S: Is there any advice you would give to a design researcher using probes for the very first time?

S: Anything else that we haven't covered that you feel is important?

S: Have you used Probes in other projects that was different to this one? How were they different to this one?

Debriefing

S: Why I am doing this. How to integrate this into the research.

S: Even if anonymized, their identity may be traced. Ask them what they would prefer, whether they want to be credited.

Appendix B: Study II materials

B.1 Participant information sheet



**Northumbria
University**
NEWCASTLE

Probing into Research through Design

Participant Information Sheet

You are being invited to take part in this research study. Before you decide it is important for you to read this leaflet so you understand why the study is being carried out and what it will involve.

Reading this leaflet, discussing it with others or asking any questions you might have will help you decide whether or not you would like to take part.

What is the Purpose of the Study

This study aims to obtain insights on the implicit aspects surrounding (design) Probes in Research through Design activities. It will supplement a historical review of overlooked or taken-for-granted issues around design-led research, and build upon the researcher's previous study on the unreported motivations and aspects of decision-making around Probes by providing insights into researchers dissemination practices.

Why have I been invited?

Because you are a design researcher who have used Probes in at least one of your past projects and published about it, mentioning Probes/probing either in the title, keywords, or body text in reference to Gaver et al's Cultural Probes (1999).

Gaver, B., Dunne, T., & Pacenti, E. (1999). Design: cultural probes. *interactions*, 6(1), 21-29.

Do I have to take part?

No. It is up to you whether you would like to take part in the study. I am giving you this information sheet to help you make that decision. If you do decide to take part, remember that you can stop being involved in the study whenever you choose, without telling me why. You are completely free to decide whether or not to take part, or to take part and then quit the study before completion.

What will happen if I take part?

Because of Covid-19, all activities will take place virtually. You will be asked for a Skype (or similar) focus group interview with the researcher and 3 to 4 other design researchers. Once the interview date is set, you will be sent a consent form for you to complete to say you agree to take part in the study, and you will be asked to sign and deliver it back to me before taking part in the interviews.

Before the interviews, you will be asked to confirm/suggest a published paper on your use of Probes, and highlight sections and points of discussion to expand and reflect on during the interviews. The researcher will then curate and circulate the selection of quotes and points of discussion along with the papers within the focus group. You will be given at least one week to read through and reflect upon these resources before the interviews.

You will then take part in a focus group interview, where we will start by giving some background about ourselves and our research, move on with individual reflections on the implicit and often not reported aspects of Probes and a semi-structured discussion on the dissemination practices that make these aspects implicit. The focus group is expected to last about 60-90 minutes. It will be video recorded for the researcher to refer to the relevant excerpts if shown a visual material, but only the audio will be used for analysis.

What are the possible disadvantages of taking part?

You can always contact the principal investigator after the interview and share your concerns if you have any. The contact details are provided at the end of this document.

Will my taking part in this study be kept confidential and anonymous?

You and your work will very likely already known to the research community and this study would benefit from non-anonymization for contextualization. However, if you prefer, you will be given the option to be anonymized. Otherwise, you will be explicitly credited in the study. We will also offer for you to be a co-author a potential publication on the study, after the researcher has finalized their PhD thesis. All recordings will be transcribed by the principal investigator, and if you request anonymization, the transcripts and other materials will be given a unique identifier, which will match an anonymized participant identifier.

How will my data be stored, and how long will it be stored for?

I will use a portable hard drive and store the data encrypted in it. The hard drive will be physically locked away and stored in a cabinet to which only I and my supervisors have the key.

All audio recordings will be transcribed by the principal investigator, following which the original video recordings will be destroyed.

All other information and data gathered during this research will be stored in line with General Data Protection Regulation and will be destroyed 36 months following the conclusion of the study. If the research is published in a research journal it may be kept for longer before being destroyed. During that time the data may be used by members of the research team only for purposes appropriate to the research question, but at no point will your personal information or data be revealed. Insurance companies and employers will not be given any individual's personal information, nor any data provided by them, and nor will we allow access to the police, security services, social services, relatives or lawyers, unless forced to do so by the courts.

What categories of personal data will be collected and processed in this study?

Data collected will include video recordings from interviews and the curated quotes and points of discussion.

What will happen to the results of the study and could personal data collected be used in future research?

The general findings might be reported in a scientific journal or presented at a research conference, and you will be asked to co-author these. However, the data will be anonymized and you or the data you have provided will not be personally identifiable, unless you prefer to be explicitly credited. The findings may also be shared with other organizations/institutions that have been involved with the study. We can provide you with a summary of the findings from the study if you email the researcher at the address listed below.

Who is Organizing and Funding the Study?

Northumbria University

Who has reviewed this study?

The Faculty of Arts, Design and Social Sciences Research Ethics Committee at Northumbria University have reviewed the study in order to safeguard your interests, and have granted approval to conduct the study before this study could begin.

What are my rights as a participant in this study?

Your rights under GDPR include:

- A right of access to a copy of the information comprised in their personal data if you submit a [Subject Access Request](#);
- A right in certain circumstances to have inaccurate personal data rectified;
- A right to object to decisions being taken by automated means.

If you are dissatisfied with the University's processing of personal data, you have the right to complain to the Information Commissioner's Office. For more information see [the ICO website](#).

Contact for further information:

Principal Investigator Sena Çerçi: sena.cerci@northumbria.ac.uk
Principal Supervisor Stacey Pitsillides: stacey.pitsillides@northumbria.ac.uk
Research Ethics Director Mark Blythe: mark.blythe@northumbria.ac.uk
Data Protection Officer Duncan James: dp.officer@northumbria.ac.uk

B.2 Consent form



**Northumbria
University**
NEWCASTLE

CONSENT FORM

Project Title: Probing into Research through Design

Principal Investigator: Sena Çerçi

*please tick or initial
where applicable*

I have carefully read and understood the Participant Information Sheet.

I have had an opportunity to ask questions and discuss this study and I have received satisfactory answers.

I understand I am free to withdraw from the study at any time, without having to give a reason for withdrawing, and without prejudice.

I agree to take part in this study.

I also consent to the retention of this data under the condition that any subsequent use also be restricted to research projects that have gained ethical approval from Northumbria University.

Signature of participant.....	Date.....
.....
Signature of researcher.....	Date.....
.....



**Northumbria
University**
NEWCASTLE

**FOR USE WHEN PHOTOGRAPHS/VIDEOS/TAPE RECORDINGS WILL BE
TAKEN – SKYPE INTERVIEWS**

Project title: Probing into Research through Design

Principal Investigator: Sena Çerçi

I hereby confirm that I give consent for the following recordings to be made:

Recording	Purpose	Consent
Video recording of the interviews	Only the audio will be used for transcription and the latter analysis. The relevant video excerpts where the visual materials may be shown will be used only for reference by the researcher and will not get published anywhere.	

Signature of participant..... Date.....

.....

Signature of researcher..... Date.....

.....

B.3 Invitation e-mail

E-mail Subject: Invitation to Critical Reading Group on Probes

Attachments: Participant Information Sheet

Hi [Name],

I am a PhD student in Northumbria School of Design (UK) working with Dr. Stacey Pitsillides and Prof. John Vines (cc'd), studying how Probes generate knowledge within Research through Design practices. As part of my PhD studies, I'm forming a critical reading group on Probes. All activities will take place virtually in late March, expected to take 60-90 minutes, and will be recorded to form the core part of my PhD case study. I am happy to share the recording with you following the study and collaborate towards a co-authored publication on its outcomes.

I'm getting in touch with you because you have published on Probes and used them in your research. I'd like to invite you to take part in this collective space to explore each other's work on Probes and discuss some of the implicit practices, concerns and complexities around using them to further improve our design-led research practices. Attached is the university-approved Participation Information Sheet for this study if you'd like to know more and below is a brief abstract for my PhD research. Please feel free to contact me from this e-mail if you have further questions about the study or my research. If you're happy to take part in the critical reading group, please add your name and select your availability in the week of March 15 and 22 in the following

link: https://doodle.com/poll/cmn8xmeiyctesar8?utm_source=poll&utm_medium=link

I look forward to hearing from you.

Kind regards,
Sena Çerçi

-

Abstract: My PhD research investigates the narratives and practices around design Probes in Human-Computer Interaction (HCI) to understand implicit practices and complexities around conducting design-led research in the field. By locating the prior conceptual and methodological discussions surrounding Probes in contemporary design-led research in HCI, I problematize the plurality of design-led research practices that are taken-for-granted under the umbrella term of 'Research through Design'. This research expands on the under-articulated aspects of reflexivity around Probes as a designerly approach to research through a series of empirical studies with design researchers who have used and published on Probes.

B.4 Forming & informing groups

Calendar Event Subject: Critical Reading Group

Attachments: Consent Form

Hi again [Name],

Thank you for your interest in taking part in the Critical Reading Group.

Based on your availability, I suggest a session on [Date, time] with [Name], [Name], [Name]. The details to join the Zoom meeting are as follows: [Link], [meeting id & passcode].

Before the session, there are three things I'll ask you to do:

- Please confirm the paper you would like to talk about in the session: [Paper title]. If this is not the paper you'd like to talk about, please send your paper to me before [date – two weeks before the session*send reminder about this if they don't].
- Please sign and send the attached consent form to me.
- Please read the other researchers' papers, all available to download in the following link: [Dropbox link]. As you read, please think about the following questions for your own paper, as well as what you'd like to ask to the other researchers during the session:
 1. How did you make decisions on what is included and left out when reporting and dissemination of your work?
 2. Why did you leave certain key motivations, factors and aspects of your work out of published accounts?
 3. How might we encourage and support making explicit our critical reflection and reflexivity through the conduct and dissemination of design-led research?

I'm looking forward to hearing from you again.

Kind regards,
Sena Çerçi

B.5 Overview of study participants

Researcher	Bio	Paper, Venue, Format	Related Papers
Eleanor Chin Derix CRG1 ECD	<ul style="list-style-type: none"> PhD student at Interaction Design + Human Practice Lab, School of Computer Science, University of Technology Sydney, Australia Design background 	Probes to Explore the Individual Perspectives on Technology Use that exist within Sets of Parents (Derix & Leong, 2020: DIS 2020 Full paper)	<p>Towards a Probe Design Framework (Derix and Leong, 2019: OzCHI 2019 Full paper)</p> <p>Tactics for Designing Probes to Explore Parents' Differing Perspectives on Family Technology Use (Derix and Leong, 2020: NordiCHI 2020 Full paper)</p>
Jeanette Bell CRG1 JB	<ul style="list-style-type: none"> PhD student at Interaction Design + Human Practice Lab, Faculty of Engineering and IT, University of Technology Sydney, Australia Medical sciences background 	Collaborative Futures: Co-Designing Research Methods for Younger People Living with Dementia (Bell and Leong, 2019: CHI 2019 Full paper)	Collaborative Futures: A Technology Design Approach to Support Living Well with Dementia (Bell and Leong, 2019: OzCHI 2017 Short paper)
Dan Lockton CRG1 DL	<ul style="list-style-type: none"> Assistant Professor at Department of Industrial Design, Eindhoven University of Technology, Eindhoven, Netherlands Design background 	Sleep Ecologies: Tools for Snoozy Autoethnography (Lockton, Zea-Wolfson, Chou, Song, Ryan, Walsh: DIS 2020 Full paper)	
Karey Helms CRG1 KH	<ul style="list-style-type: none"> PhD student at Department of Media Technology & Interaction Design, KTH Royal Institute of Technology Stockholm, Sweden Design background 	Leaky Objects: Implicit Information, Unintentional Communication (Helms, 2017: DIS 2017 Provocations & Works in Progress)	<p>Revealing Tensions in Autobiographical Design in HCI (Desjardins and Ball, DIS 2018 Full paper)</p> <p>Design Methods to Investigate User Experiences of Artificial Intelligence (Helms, brown, Sahlgren, Lampinen, 2018) - AAAI full symposium paper</p> <p>Careful Design: Implicit Interactions with Care, Taboo, and Humor (Helms, 2020: DIS 2020 Doctoral Consortium paper)</p>

Researcher	Bio	Paper, Venue, Format	Related Papers
Andy Boucher CRG2 ABo	<ul style="list-style-type: none"> Senior Lecturer and Co-director of the Interaction Research Studio at Goldsmiths, University of London, UK Design background 	TaskCam: Designing and Testing an Open Tool for Cultural Probes Studies (Boucher, Brown, Ovalle, Sheen, Vanis, Odom, Oogjes, Gaver, 2018: CHI 2018 Full paper)	ProbeTools: Unconventional cameras and audio devices for user research (Boucher, Drown, Gaver, Matsuda, Ovalle, Sheen, Vanis, 2019: ACM interactions magazine article)
Arne Berger CRG2 ABe	<ul style="list-style-type: none"> Professor of Human Computer Interaction at Hochschule Anhalt, Köthen, Germany Design and computer science background 	Sensing Home: Designing an Open Tool That Lets People Collect and Interpret Simple Sensor Data from Their Homes (Berger, Kurze, Totzauer, Storz, Lefeuvre, Bischof, Freiermuth, 2018: De Gruyter i-com Journal paper)	<p>Sensing Home: Participatory Exploration of Smart Sensors in the Home (Berger, Bischof, Totzauer, Storz, Lefeuvre, Kurze, 2019: 'Social Internet of Things' Book chapter)</p> <p>Sensorstation: Exploring Simple Sensor Data in the Context of a Shared Apartment (Denefleh, Berger, Kurze, Bischof, Frauenberger, 2019: DIS 2019 Full paper)</p> <p>Guess The Data: Data Work To Understand How People Make Sense Of And Use Simple Sensor Data From Homes (Kurze, Bischof, Totzauer, Storz, Eibl, Brereton, Berger, 2020: CHI 2020 Full paper)</p>
Heather McKinnon CRG2 HM	<ul style="list-style-type: none"> Lecturer at Queensland University of Technology Design Lab, Brisbane, Australia Design background 	Exploring the home environment: fusing rubbish and design to encourage participant agency and self-reflection (McKinnon & Sade, 2019: Design Studies Journal paper)	<p>The Work of Making: Reflections on the Process, Form and Function of Two Sets of Design Research Artefacts (McKinnon & Foth, 2017: OzCHI Long paper)</p> <p>1300 Pieces of Rubbish: A Collaborative Approach to Making Sense of Everyday Resource Sufficiency in the Home (McKinnon, Foth, Sade, 2020: DIS 2020 Pictorial)</p>

Researcher	Bio	Paper, Venue, Format	Related Papers
Enrique Encinas CRG3 EE	<ul style="list-style-type: none"> Assistant Professor at Department of Computer Science at Aalborg University, Denmark Design background 	Metaprobes, Metaphysical Workshops and Sketchy Philosophy (Encinas, Durrant, Mitchell, Blythe, 2020: CHI 2020 Full paper)	
Doenja Oogjes CRG3 DO	<ul style="list-style-type: none"> PhD student at Everyday Design Studio at Simon Fraser University School of Interactive Arts + Technology, Surrey, Canada Design background 	Designing for an other Home: Expanding and Speculating on Different Forms of Domestic Life (Oogjes, Odom, Fung, 2018: DIS 2018 Pictorial)	Diversifying the Domestic: A Design Inquiry into Collective and Mobile Living (Odom, Anand, Oogjes, Shin, 2019: DIS 2019 Pictorial)
Britta Schulte CRG3 BS	<ul style="list-style-type: none"> Postdoctoral researcher at Computer Science Department at Bauhaus-University Weimar, Weimar, Germany Design background 	Homes For Life: A Design Fiction Probe (Schulte, Marshall, Cox, 2016: NordiCHI 2016 Full paper)	HawkEye - Deploying a Design Fiction Probe (Noortman, Schulte, Marshall, Bakker, Cox, 2019: CHI 2019 Full paper)

Researcher	Bio	Paper, Venue, Format	Related Papers
Chris Elsden CRG4 CE	<ul style="list-style-type: none"> • Postdoctoral researcher at Design Informatics at the University of Edinburgh, Edinburgh, UK • Social sciences and design background 	Metadating: Exploring the Romance and Future of Personal Data (Elsden, Nissen, Garbett, Chatting, Kirk, Vines, 2016: CHI Full paper)	On Speculative Enactments (Elsden, Chatting, Durrant, Garbett, Nissen, Vines, Kirk, 2017: CHI 2017 Full paper)
John Mills CRG4 JM	<ul style="list-style-type: none"> • Associate Professor at Media Innovation Studio at UCLan, Lancashire, UK • Journalism and media background 	NewsThings: Exploring Interdisciplinary IoT News Media Opportunities via User-Centred Design (Mills, Lochrie, Metcalfe, Bennett, 2018: TEI Work-in-progress paper)	
Susanne Hensely-Schinkinger CRG4 SHS	<ul style="list-style-type: none"> • Postdoctoral researcher at Multidisciplinary Design Group at Vienna University of Technology, Vienna, Austria • Design background 	Using Cultural Probes in the Sensitive Research Setting of Informal Caregiving. A Case Study (Hensely-Schinkinger, Schorch, Tellioglu, 2018: De Gruyter i-com Journal paper)	
Tom Jenkins CRG4 TJ	<ul style="list-style-type: none"> • Assistant Professor at Department of Digital Design at IT University of Copenhagen, Copenhagen, Denmark • STS and arts background 	Designing with Emerging Science: Developing an Alternative Frame for Self-Tracking (Jenkins, Boer, Homewood, Almeida, Vallgård, 2020: OzCHI 2020 Full paper)	

B.6 Transcripts

CRG1 audio

R = Researcher

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R - ... recording now.

ELEANOR - I can go ahead if you like?

R - Yes, please.

ELEANOR - Hi, I'm Eleanor, I'm a PhD student as well at UTS, so currently I'm in my third to fourth year, because of COVID last year was a little bit of a weird one. So the paper that Sena shared is actually one of, just for context, it's one of three papers published around that method that I used as part of pretty much the core piece of my PhD work. I'll be really honest about the... I was really surprised to have those papers published around the method. There wasn't... my PhD's not focusing on methodology, or at least the intention from the outset wasn't... I was surprised that there was that contribution, so pleasantly surprised. I have an industry background, so I was coming into academia from design industry and I was interested in, from an industry perspective, working in user research, looking at taking more of a reflective look at how technologies were affecting every day life in families, whereas my experience in industry had been more to probe into life in order to find opportunities to insert more technology, and this was more to be taking a look at what was the existing technology doing to those dynamics rather than trying to find holes to fill with more tech. So I was looking... I was anticipating that this study was going to be having the predominant contribution on the content side in terms of the insights around the experiences, but this... there was a preceding workshop with parents, so the focus being on families who have small children and looking at the literature, there was a lot of work looking at the way in which technology affects the dynamics between parents and children, but what seemed to have been overlooked was how technology actually affects the relationships between parents. So parents tend to be researched as a homogenous group, that parents do this or parents do that, that this workshop revealed that there was a lot of conflicted feelings between parents trying to collaborate on integrating technology into their family's life and that parenting being a joint endeavour had been sort of overlooked. So then the challenge was to go into families and try and tease apart these individual experiences of each parent and try and pick apart what was common and what was maybe particular to each parent. So that's where the method came in, because I didn't find a method that had taken two people and try to examine a collaborative but individual perspective of an experience. So families had tended to be... work with probes in a way that a whole family would... so just some high level examples, there would be one family representing each... one person

CRG1 audio

36 representing each family, so eight participants representing eight different families, that's how an
37 individual way of using probes on families had been done, or there was this way of taking... of
38 forming persona families, so the Jones' and the Smith's and having them all work together and
39 presenting themselves as a family. So the work that I did ended up finding a middle way and
40 combining these approaches and offering participants a combination of opportunities to respond
41 both individually, and this really important part of... there was one method... one probe that I used
42 that took... each parent would complete the probe individually, and then later in the study they
43 would share their responses to the probe with each other and then repeat the same task
44 collaboratively, and that... just by tweaking it in that way opened this matrix of comparison
45 between each parent, the joint one. So this particular paper ended up really highlighting, on quite a
46 focused way, two particular tactics that we used in order to get to what we were trying to get to,
47 and, so that was the framing. So this particular paper ends up focusing down. There was a preceding
48 paper on just opening up on to that topic of how do we move from probes in general towards probes
49 with multiple perspectives, and then there was another one just describing more the probes in
50 general... describing each probe and giving you a sense of the context in probably a larger view,
51 and then this particular paper that Sena shared was much more focused on a strategic way to tease
52 apart these different... if you were going to any other situation with a social element, how you
53 could use that particular tactic quite strategically. So I'd say this is the most focused paper on the
54 method side, yeah.

55

56 R - Thank you. Who would like to continue? Jeanette you're speaking but you're muted.

57

58 JEANETTE - Thank you. I'm thinking I might go next because Eleanor and I are colleagues from
59 the lab in Sydney, same university, so really watched Eleanor develop that one for work and those
60 concepts. I guess mine is probably in a very similar setting in a sense in a sensitive setting, where
61 Eleanor is looking at families and children and my research is really looking at people with younger
62 onset dementia and looking how digital technologies can support their lives. I guess similar to
63 Eleanor as well, my background is not really in HCI, it's in medical science and again like Eleanor,
64 I have a corporate background, 20 years in medical science and in dementia, and looking at
65 pharmaceutical solutions and really there are no treatments coming, the pharmaceutical pathway is
66 still not really leading to supporting people with dementia. So I sort of shifted my attention
67 knocking on the door around the university to think, "What else can we do?". Then I think by virtue
68 of, my dad had Alzheimer's, so by virtue of watching him with the iPhone and taking selfies and all
69 these things that we use, tactics to distract him, I started to think about technology and dementia.
70 So I was fortunate to be invited in to a PhD programme and mine is really just... now I'm at the

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71 stage where I'm a few weeks off, hopefully, finishing my thesis, so I'm at that end stage, and mine
72 is definitely about methods. I didn't realise that in the beginning. What really... in principle what
73 it's about is that thinking about how to elicit these experiences and these stories and how different
74 the experience is, not just for people with dementia in general, how different those individual
75 experiences are, but how different dementia in a later stage of life is to dementia being diagnosed in
76 your 30s or 40s or 50s, when you're in the workplace and you have dependent children and you're
77 failing in the workplace, so many different things are happening, there's financial burdens way
78 beyond anything really that you experience when you're in a later stage of life. So how do you
79 elicit those stories? That's where the... I hit the methods barrier, I looked for conventional methods,
80 I was aware of them even in my medical science work, but really with dementia there was a... in
81 particular one way was to gather information by virtual... using a proxy or another person speak on
82 behalf of the person. Really as I started to meet people with younger onset dementia, I realised that
83 that's just not who they are and that is so not what they want, and it didn't take me long, and I think
84 maybe meeting two or three people in with younger onset dementia that I realised that really they
85 had more experience than me even in this space, they had scientific backgrounds, and I really just
86 had to work out a way to facilitate their stories. So with that I start... my first paper was really a
87 position paper, like an awareness paper, "This is what I'm seeing", second paper was building from
88 that then and collaborating with people with younger onset dementia. So they were co-designing the
89 methods and suggesting a way, an approach that they would find respectful and collaborative, so,
90 and that was my second paper that probably is the one here for tonight. As I say, we went on this
91 journey together, there were five people who joined my study years ago and they're still part of it.
92 The beautiful thing I think, the most proud moment of all these years is really that they... we have
93 co-authored a chapter in a book that talks about methods, but it's their words, they're authors now,
94 co-authors and that's been a wonderful ending to this PhD.

95

96 R - Thank you. Dan or Karey, which one of you would like a go?

97

98 DAN - I don't mind if it's easier. Thanks everyone. Yeah, so I mean I think... so the paper the Sena
99 chose is really... I mean I feel a bit of a, well not fraud here, but I mean it's... so this is really a
100 paper where myself and a group of undergraduates that I was teaching, design students, we did a
101 project where they investigated their own sleep, how... because a lot of students, and this was
102 before the pandemic, this was in early 20... I guess we did it in 2019, I suppose. Yeah, I'm trying to
103 remember when we actually did the work. But students don't always sleep very well right, I mean
104 it's a basic point due to lots of pressures, due to learning how to live independently and lots of
105 different ways. Students sleep in some quite unusual ways, and where we were at the time at

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106 Carnegie Mellon, the students were under a lot of pressure, I mean it's very much a stress culture
107 place where the students felt that they... they felt pressured to not to sleep that much or to do all-
108 nighters or to do this level of working hard in order to play hard, but actually not playing hard
109 either, just working hard and then being upset about it. So we were interested in sleep from that
110 point of view, but part of the motivation, and this is partly where it's a little bit, I don't know,
111 circular reasoning in a way is that we managed to get a small grant from Philips who were setting
112 up a sleep, sort of, research centre I guess around their various sleep products and sleep healthcare
113 products that they produce, so things like... there's a lamp, a light, an alarm clock that wakes you
114 up gradually with a sunrise effect and various products for sleep apnea and OPD masks and things,
115 and Philips were interested in effectively HCI research around sleep, and they agreed to partially
116 sponsor us on the student project. But they were very interested in it from I guess a big data point of
117 view, I think their perspective was that, "Oh, well the students will devise some sort of app that you
118 use to monitor your sleep", and they'll get a huge amount of data from it and that could enable
119 some application, machine learning and all this sort of stuff. But I think we were interested, or
120 partly I wanted to resist that a bit while still taking the money to keep for the student project, so we
121 did something that was explicitly not about collecting big amounts of data, it was about individual
122 students building or devising probes for themselves to investigate their own sleep patterns. A
123 couple of people used... you know, gave it to a couple of their friends to try, but these were very
124 much tailored things based around individual students' investigation or exploration of their own
125 sleep, what do they feel affects it, is it things due to work pressures, is it something around, sort of,
126 the actual patterns of where they sleep even, do they sleep on campus and different places, did they
127 have particular routines they did before they went to bed that they felt, or when they woke up that
128 they felt helped them sleep better or didn't. So they were very, very personal things effectively what
129 the students built, like probes for investigating their own sleep patterns. I mean they are probes, but
130 I would say they're somewhere between... sort of... like... I mean what does it mean to design a
131 probe for yourself? I guess it means paying attention to things you think you want to notice about
132 yourself and designing something that amplifies those in some way, or helps you amplify them. So
133 they're very different things, we had... I mean over the five students some of the things they built
134 are physical, some were digital, some were a mixture, they were basically things they found
135 interesting. It meant that, we did have to justify it to Philips and I think they wanted something... I
136 think they would've been happier with something that generated more explicit quantitative data, but
137 I felt there was something interesting in trying to explore this idea of auto-ethnographic probes or
138 autobiographical probes or whatever we want to call that. But I would say as with lots of things in
139 writing papers, there's a degree of us, or me to a large extent, trying to fit what the students did to
140 established terminology in HCI. I mean we did talk about them as probes, but I mean we only

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141 realised the autobiographical aspect or auto-ethnographic aspect would become a central thing once
142 we partly realised that the students were devising things that really only worked for themselves. So
143 although it started with, “Investigate yourself and then let’s apply it to others”, it never really got to
144 the apply it to others bit, and, so we thought, “Okay, well this is fine, well let’s justify it as being
145 that”. So yeah, I don’t know, so it’s a rambling kind of explanation but I mean really they
146 developed these things, some of them were products, some of them were, you know, combined with
147 apps, some of them were physical things like giving people bits of foam and saying, “Could you
148 sleep comfortably on this chair?” or whatever if you produce a pillow or something in that way. So
149 yeah, I mean I guess the insights from it were kind of around the sort of possibilities of this type of
150 thing, giving people things that they can reconfigure or use to investigate their own, sort of, patterns
151 in their life and then, you know, what can designers get from that I guess, and we came up with
152 some justifications to fit it into some bigger patterns around that. But yeah, anyway, sorry, that’s a
153 rambling explanation but I hope that makes sense.

154

155 R - Thank you Dan. So finally, Karey.

156

157 KAREY - Yes. Can you hear me okay again, because this needs to be at just the right position?
158 Yeah, Dan’s is actually I think a perfect precursor to mine because mine is an autobiographical, and
159 I also hesitate on whether the word “probe” is quite right or how it’s being used. But first I guess a
160 bit a background, so I’m a PhD student at KTH, and I have a year and a half left of a five year
161 programme, and this work-in-progress paper was the very first paper I did in early 2017, and the
162 math doesn’t add up because I took leave for a while. So this project, which it is ongoing in terms
163 of writing and reflecting on it, but the actual probe itself is no longer ongoing. So I’m part of a
164 project that’s really looking at the implications or the design of, well, we use the term “implicit
165 interactions”, so invisible or unseen technology that’s often operating on the behalf of humans.
166 This project started when my partner and I, this was our, I don’t know, our fourth international
167 relocation together and this one time it was for my job, and he left his job, we were living in the UK
168 before, and I had been the one moving “for him” before, and, so I was very aware of the changes in
169 routines and being that person at home, and sometimes enjoying the freedom of not knowing what
170 to do with yourself and also being a bit scared about what’s going on and also very aware of...
171 concerned about resentment and making a move and these big life decisions together. So this probe,
172 I think Dan said really well, is paying attention to things you want to notice about yourself was
173 really grounded in me trying to understand what this meant... what was going on in terms of our
174 move and exploring something to understand how our communication might change. From it, I
175 think it’s really interesting because this short paper definitely speaks to... has a focus on, okay, how

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176 can we generalise me building this really simple system and designers learning from it and this
177 phrase, “leaky objects”. But from it I got a lot of critique in terms of the ethics that... of doing...
178 essentially spying on my partner, and this happened in terms of presentations, “Does he know?”
179 asked over and over again and also this being the first thing I wrote and I wrote alone, my
180 supervisor was on leave at the time. I realise now maybe I could’ve phrased or said some things
181 differently to clarify his involvement in some parts and also maybe perhaps my taking advantage of
182 him in other parts, but again, the very first thing. Now I feel like I’m rambling. But what was really
183 interesting I think, from also a dissemination perspective, is I was then later interviewed about this
184 project for a paper on tensions in autobiographical design, and that was incredibly therapeutic in a
185 way that it gave me an opportunity to then say to the community, “No, actually we did
186 brainstorming together, he was involved in certain kinds of ways”, and to just very explicitly say
187 how much I care about us and I recognise that there is a tension here. Not that I necessarily think I
188 did something wrong, but I have reflected on how it might... things might be done differently later
189 on. So maybe it’s also worthwhile saying, so the progression of my PhD has been to... I continue to
190 focus on intimate settings of care as way to critique and explore the design of implicit interactions
191 from... and this includes urinary systems and infrastructures to also a project I’m working on right
192 now is on my breastfeeding relationship. So again, very intimate family settings where now we are
193 involving, I think relating to Eleanor’s work, a child and how we talk about... what we include
194 when we include certain types of things in research and what is shared and what is not shared and
195 the weighing between family in a very intimate researcher connection setting, and really wanting to
196 impact design and other non-design communities with certain types of knowledge. So maybe
197 that’s... I think perhaps that’s a good enough overview.

198

199 R - Thank you. So I guess now we can have an open discussion if any one of you wants to start
200 asking questions or opening up a certain theme about their own paper, feel free to do so, otherwise
201 I’ll start asking questions. Eleanor, you were saying something but I think you’re muted.

202

203 ELEANOR - Yeah, from the questions that you sent out I was wondering what would be... I was, I
204 guess, trying to guess what the focus of your work is on in terms of... the thing that seemed
205 interesting to me was the question about what you chose to include versus leave out and reasons for
206 that, I was assuming that you were... sorry, you had taken this assumption or you’ve done work
207 that has led you to a belief that there are these motivations for people to leave things out and that
208 your work might be looking at how... I was just really curious to know what the focus is and what
209 your vision is with your work?

210

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211 R - Yeah, thank you, so maybe I should've clarified that a bit better before actually bringing you
212 together here. But one of the things that I have already found out that from my first study, which
213 was an interview study with design researchers again on probes, why and how they use probes, it
214 came across as... one of my findings was that it's a very open to interpretation concept. So it's
215 either a set of designed artefacts or it's a stance to data and it's still not clear in what way it's
216 addressed as or referred to as probes, and sometimes there were also things that are not reported in
217 the papers that resulted from either the format or the venue or sometimes the review processes that
218 eventually resulted in calling them probes. I'm also interested in how do you read a design text,
219 whether that be the original text on probes and how people interpret these texts and get inspired by
220 it, but also how we read each other texts and what we focus on trying to understand the implicit
221 aspects of them, so these are really my interests.

222

223 ELEANOR - Okay. Yeah, so as I said, because I hadn't entered with a heavy intention to start with
224 probes and rigorously push them out, it was more a needs must. But had there already been a
225 method designed, teasing apart, I don't know, you know, in workplace situations. So I think what
226 my experience with probes was, would've been initially... and this sort of talks to me coming from
227 industry was that... I think my supervisor said, "Well have you thought about using probes?" and
228 it's funny because I studied at the Royal College of Art where... and then found this seminal work
229 from Tony Dunne on probes, and I used to be in the next room to this guy and had no idea that this
230 was... so I think I said, "I've not used probes", and then I looked at it and I was like, "We use
231 probes all the time in industry, we just don't call them probes". So we would run field work with...
232 I would have heard diary studies, I've never... in the hundreds of scopes to clients I had never
233 included the word "probe". So that was my first, that's my first memory of this word "probes".
234 Then it came to okay, well I'll definitely use that method because I'm super familiar with it, so my
235 process was probably a little bit backwards in that coming with that experience, I then... had I not
236 had that industry experience I probably would have then thoroughly checked out all the literature to
237 see how probes had been done, chronologically, given my focus, or rather I saw, "Okay, these are
238 examples of probes, yes use them". It was sort of similar to how I then began with my interview
239 study with that experience, there's some parts of the PhD process where I am a complete beginner,
240 so in that industry experience there was... I don't think, apart from scopes, we didn't do a whole lot
241 of writing so I'm like, "Okay, how do we do this?" The probe design I took on as building on my
242 experience of probes. So it was more... my second flag where that word "probes" came up was in
243 returning to the literature and seeing how contested it was, so finding a lot of papers, which
244 frustrated me at first because I felt like I wasn't getting anywhere, that all seemed to be just people
245 making a case for what probes were and weren't and a lot of caution raised around probes that I felt

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246 again, coming from a space where things are practised and done and less read about and thought
247 about, it felt like it was sort of picking over quite fine details and potentially, yeah, I think from a
248 practice point of view as a practising designer, felt like this could maybe be holding things up,
249 because it was then introducing a sense of caution into my writing about how... so space being
250 taken up in a paper to clarify that a nod to all these opinions that had been made before to say,
251 "Yes, I understand this and this and this". It felt to me like, whilst understanding those texts, given
252 the page restrictions on a paper, that it would be a shame if too much space was being used up
253 continually making all these nods instead of getting to the nitty gritty of what actually had been
254 done on this method. Yeah, I think where Dan had said, "Where's the line?" I definitely find in the
255 text that I've read about probes, given that it's contested so much in the literature, it does
256 sometimes feel quite interesting the span of things which are called probes, and I guess the line is
257 almost like probes and then at some point it becomes a design intervention, and I wonder if there's
258 pros and cons of using those terms. If you move it and you say it's a design intervention, if you're
259 then expected to have further contributions or something, so why people choose to either call it a
260 probe or an intervention would be interesting to me to understand. I think from reading all those
261 texts and trying to frame for myself, I saw... so for instance, with my work where I was trying to
262 understand how technology was affecting people's experiences, there was definitely the thought of
263 maybe including some existing technologies that say "track phone usage" and then saying if you
264 use an off the shelf product that tracks phone usage, is that a probe? Because yes, it's capturing data
265 but on the other hand you haven't designed it, it's something that... and also that decision not to use
266 that came from this, almost a bit of a purer ideology of thinking, "You're going to be changing their
267 device use, because they're going to be using a tracking device like this probe is supposed to be..."
268 I always have a visual of a moon landing, that this is a probe that goes out and it roams around and
269 it brings back things in quite a random way, and then from that it opens discussions. Yeah, I think
270 finally from an industry perspective, when I've used probes in industry, my issue with clients has
271 been primarily having them... it's a completely different... it's the polar opposite in having
272 frustrating conversations about how we don't know what we're going to get. So there's always a
273 huge fear about going to collect... and I wonder if that's with Philips even the case that they want
274 to know what they're going to be getting before investing in something and it's totally foreign to
275 them not to know what they're going to be getting. So the thing I had been drumming for years was
276 we don't know what we're going to get and that's the whole point, and that's why it's so valuable,
277 and that the data that we capture serves to open discussions and it is not the data for the data's sake
278 that we're capturing. So there's no need to be worrying about a lack of return on investment if we
279 capture data from several families and we can't compare it because it's different, that's the not the

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280 point of the data, and I think that for me was always the most uncontested aspect of probing, and, so
281 maybe that's different from an intervention or something.

282

283 DAN - It makes a lot of sense Eleanor a lot of the things you said there. I think there were two bits
284 that I wanted to pick up I guess in relation to some of this. One of them was, well that last point
285 around how do you... almost like, what is the point of doing this... it seems like part of the point of
286 probes or part of at least the way that they, I guess Tony Dunne, and Eleanor potentially, and Bill
287 Gaver, when they... they seem to talk about it very much as being almost unexpected, unplanned,
288 the responses being intentionally not easily reducible or categorisable or labelable even. But that is
289 difficult to explain the value of that to someone, whether that's someone in academia or in a more
290 corporate setting perhaps, where the whole point of funding the study is to be able to categorise
291 things, to be able to cluster them, to be able to say, "What category do these fit in? How can we
292 code them?" and if you say, "Well the whole point is that people are generating things that are not
293 about your categories", that can be a difficult starting point I think. The one thing we found with
294 what we were doing was that there was a project that Philips had sponsored, or another project
295 they'd done that involved... which was quite a big data led project around various things including,
296 one of the applications was around baby bottle feeding practices I guess, how do parents make the
297 decisions about when to feed, how to feed, how is that related to technology, and it was very... that
298 was quite quantitatively driven. But it had this one element in the project, which was a dial that
299 participants could use to record different things. So it was a dial that all it did was log a time stamp
300 with a value from one to 100 and it didn't... and it was up to the participant to say what that meant,
301 so it could be perceived stress levels, it could be how sunny it was outside, it could be anything, and
302 that was included in one of their projects and we were able to keep highlighting that and saying,
303 "Look, you do do stuff like this, look, see this, this is what we're trying to do but on another scale".
304 So it felt like sometimes it took having one thing you could point to to say, "This does already exist
305 as a thing, we haven't made this up as a practice". I don't know if that makes sense. But the other
306 thing that... I'm not sure that when I think about how actually writing papers like this, the amount
307 of extra space taken up by justifying the method in a way that is a bit superfluous. It feels like in
308 some ways it would be easier to describe what you did and not having to apply a label to it. I mean
309 we called ours "research products", using the term that Will Odom and some various other people
310 have used, is this idea that, I think at least in my understanding, was somewhere between a probe
311 and an intervention, it was like giving people a thing to live with that was almost a research artefact
312 and then the designers or the researchers get it back, they all... maybe it provides data, you
313 understand a bit about how... it's like the product itself does research. But one of the reviewers
314 really didn't like that and told us that what we'd done was not research products, because it wasn't

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315 planned in the same way as... this wasn't for this paper, I think was for a previous thing we'd tried
316 with the same, based on the same project. So we just ditched that completely because just like, well
317 it's not worth it. If reviewers, or if academia has kind of, I guess, gatekeepers maybe about the
318 particular use of terminology, sometimes it's easier just to adopt a term, which is so vague like
319 probes that has been used in so many different applications, that can in general be used to refer to
320 giving people a thing that they do something creatively with that you learn from something about...
321 from that something about their lives or the way they do things. I'm not entirely satisfied with that,
322 and people have distinguished, "Well is this a cultural probe or is this a design probe?" or whatever,
323 and I'm like, "Well everything's culturally situated, everything is designed", whatever. So yeah, as
324 you can probably tell I have some frustration with the amount of justification needed to explain or
325 situate what you're doing in reference to other people's, not... because I mean other people's work
326 is great, but almost in terms of having to justify something not in terms of what it provides, which is
327 fairly evident right, it's obvious that it has certain limitations, it has certain things that wouldn't be
328 captured by other things, but almost having to justify it being in a... It seems like using probes is a
329 way of doing things that have nothing to do with... well not necessarily nothing to do with
330 computers, but are not necessarily actually HCI. They may be about people recording elements of
331 their life on paper or drawing things or putting things in a jar or whatever, but it's a way of bringing
332 that into an HCI academic domain in a way that people, at least some of the people in that
333 community understand and they go, "Oh, well it's probes, okay, that's fine, we're okay with that",
334 even though it's not necessarily... it doesn't necessarily involve interacting with computers, though
335 it might do. But anyway, sorry, that's a rambling thing, I don't know, it just... yeah, but I agree
336 with a lot of what you said Eleanor basically.

337

338 JEANETTE - Dan, I don't think that's rambling at all. I think everything you're describing is things
339 we're all experiencing I'm pretty sure. It's funny the way I think we've already all spoken about
340 how retrofitting what we're doing into some type of rhetoric language and it's really tough, right?
341 Because I think even coming from medical science, it's very qualitative [means quantitative] and
342 it's so, now I think it's so easy compared to this qualitative... the quantitative versus the qualitative.
343 I was listening to you Karey as well and the challenges with ethics, what do you put in, what do you
344 leave out. So every, I feel like every corner I turned there was another hands up in the air, "I don't
345 know what I'm doing, can someone help?" and then go to the literature, "Okay, that's no help",
346 okay, then go to the people who I was trying to hear their voice and get these experiences out. In
347 terms of linking that to design at the end of the day, so what would they want from digital
348 technologies that would be anywhere useful for them in their day to day lives, there were two things
349 coming out of that at the end of day after a few years of this research in a technology design

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350 workshop. There were the technical attributes we were trying to pull together, but there was also the
351 experiential pieces, what do they want to experience, what are they experiencing, what are the keys
352 things they're trying to achieve from an experience perspective? So it was very important for them
353 to maintain agency and have a sense of independence. Then looking back at all the stories and the
354 data and the transcripts and like, "Okay, where are signs of agency and independence?" It was... I
355 don't know. Then ethics, ethics was such a challenge in my work, really, really tough, what was I
356 doing, how was I doing it, and then at the same time having these wonderful talented, smart folks
357 who just happened to have particular cognitive challenges just saying, "I don't want to fill out a
358 survey and okay, if you want to hear about my experiences, I can't actually even finish my name in
359 writing so how am I going to diarise for three weeks?" So at the end of the day it was... they
360 informed what they wanted in terms... they understood probes strangely enough, and they were the
361 ones who said, "Okay, give me a choice, so let's build a probe and on top of that let's actually
362 provide choice in how we give you experiential information about our day to day life and our
363 role... our experiences with technology". That was funny, at the end of the day everyone chose a
364 different means of recording their experiences, so one person was thrilled to text, loved texting,
365 loved emoji's before and after they got dementia, another person could actually... really loved
366 writing, pages and pages of writing, another person wanted to record their experiences, so every day
367 I'd get a voice file. Then trying to pick up the content in there and try and thematically and analyse
368 it all, and I think it's just a really challenging, I'm venting now by the way, I think it's just a very
369 challenging space. So I think everything you've all said, I hear the ethics challenges and what are
370 you actually doing, is it a design intervention, is it a probe, is a survey a probe, where do you put all
371 this stuff? I think it's really hard. I don't know if that's helpful, it's just me, it sounds like it's a
372 super hard space. But the richness that you get at the end of the day, you know, I think going back
373 to what you were saying Eleanor, what does it matter at the end of the day, why should it look like
374 qualitative research with so many data points that tell you one dimensional information that you
375 half expected anyway as opposed to someone's story that has a deep insight in there that could
376 completely change the way you look at a piece of technology, yeah, that's hard to get to.

377
378 KAREY - When Dan was talking I was thinking about how early on when I started my PhD the
379 advice I was given was, "If you're writing for CHI it's really good instead of saying you're
380 exploring something, say you're investigating it", there's a big difference in terms of how that is
381 taken seriously in a certain extent in regards to design, and this word "probe" to me carries in some
382 ways that same weight of an investigation, investigation of ambiguity versus just exploring what I
383 don't know. I was also thinking about how... I think I literally laughed out loud in Dan's paper
384 when it says, "Self-probe, a better name needed", that was just really kind of like a clever call out,

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385 like, "Please don't make me call this a self-probe", but because it's... not that... maybe I should
386 clarify that; not that necessarily self-probe would be a bad thing, but recognising that maybe probe,
387 other words could be used in that sense. I actually last week, I'm not going to lie, before reading
388 these papers looked up in the dictionary what probe means, because I was like, "Was mine a
389 probe?" I've kind of lost that, I think that word in term... or I use it quite loosely. Maybe it is a bit
390 of that training in terms of sticking with me, someone saying exploring versus investigating,
391 because as Eleanor was talking I was like, "Yeah, it definitely could still be a design intervention,
392 but no, I still think it is a probe". I realise the conflict that through my different research projects
393 other than this one of differentiating between what is it I'm trying to understand about myself that I
394 might or might not include in research, which I am probing, versus intervening in a space where
395 maybe I've identified something more clear or a problem or, which perhaps also gets at the... I'm
396 not sure which one of you said this, how we don't know what we're going to get, maybe it was
397 Eleanor. So mine very much being a probe because one is I, and I say this in that later paper I was
398 interviewed with, of it not being formally a research project, and, so also I think part of that was me
399 leaving space open for myself to have an out should things go wrong with it, which obviously still
400 could in some ways, in the same way especially with the work I'm doing now on breast feeding
401 relationship is trying to find ways I think as I formulate certain kinds of projects of... how can I
402 say, not just leaving space for not knowing, but leaving... having and escape plan for lack of better
403 words in terms of involving myself. There was something... there was two other things I was going
404 to say. Oh, yeah, so one was, in the project that I'm doing on urinary habits, and there's a paper I
405 wrote, the first paper I have written and hopefully there'll be more, where I did data tracking and
406 labelling of my own urinary habits for about six months, and I was like... so then do this reading all
407 your work I was thinking, "So why did I specifically label that as autobiographical data gathering
408 and labelling?", very much like the investigating. I realised it's in as a broader project is I had done
409 a very open speculative design work and I was using this data gathering to critique that. So I think
410 part of that is in a research context is I needed to have something more "closed" in what I was
411 looking for, it was too much open and ambiguity if I didn't package it I think in that way. So I,
412 because I think I could, even though I didn't think this through, now I think I could've justified it as
413 a sort of probe if I wanted to, so they all fit within these bigger pictures. The other thing I was
414 thinking about with Jeanette's work is something that I think that really stood out to me, especially
415 in reading the paper, how often you really emphasise co-authoring and co-researchers is, I think, so
416 strong. Then in your presentation you reiterate again not wanting to speak on behalf of, and I think
417 that's I think something within my autobiographical work that I'm really struggling with that I
418 really admire how you're doing and is, I think, really difficult and whether it's a vulnerable user
419 group or in my instance, well I guess now my daughter is definitely very much would be considered

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420 a vulnerable user group, but how... I can invite my partner in as a co-author but do, can I invite
421 her? Would she want that in the same way how you deal with consent and whatnot? So I think
422 there's also something really interesting in terms of probes as an invitation, I know I'm definitely
423 rambling, but where the invitation line is drawn and consent within these probes and the ways of
424 involvement beyond how I've felt they've been done in previous research, which I think Jeanette's
425 work really starts to I think capture differently. Yeah, I think that's...

426

427 ELEANOR - I'll go again if we've got time. Yeah, it's interesting the things that have come up in
428 what you guys have said have made me think about that there's a lot of... within all that discussion
429 within academia about defining probes and what they are, to me one thing that seems... that I have
430 never seen... talked about that seems almost obvious now, and it makes me think that it's quite
431 ironic that there's discussion about what they are and what there are not, when it comes to
432 actually... maybe when not when you're using them as autobiographical because then you could
433 say, "Well you've designed them so you know the intention". But I mean for sure there is this... the
434 obvious thing with when you're engaging participants is that you have to introduce and explain
435 these probes to participants, and these guys do not have design backgrounds, you get people off the
436 street, you go into their homes and you introduce them. So it would feel like in having
437 communicated what these things are, regardless of the name, if I say, "These are some probes", or if
438 I say, "These are some objects", or some activities, and for them to have completed them over the
439 course of however many weeks, it would be seem like there's already a tick in that that would
440 demonstrate inherently that the activity/object need not be justified, because by having somebody
441 participate and open themselves up to contribute within their own personal space and time would
442 mean that you've already defined that. So that I've never really thought about before but it seems
443 funny, odd that between ourselves there's these big discussions about what they are and are not, and
444 it would seem like maybe just as a devil's advocate, if you've managed to get someone's buy in to
445 do whatever it would be, to share their intimate details with you over the course of two weeks, then
446 that would be a tick, well it is what it is. Something else that I feel when I... or that I've realised, I
447 think being a PhD student comes often with a lot of... there's that very, very slow journey of
448 initially coming in and being intimidated by everything and assuming that everything that's come
449 before is correct and that you're needing to navigate to make your own correct path through that,
450 and I think it comes much later to start questioning, "Really, is that how it needs to be?" I'd say that
451 a frustration from a design point of view of... the very practical side of being a designer is that what
452 I find... let's say I take a paper and I'll skim parts and then I wouldn't want to admit that I've
453 skimmed because I would want to think that I'm becoming a very thorough academic researcher
454 who reads every single thing, but from a user experience taking myself as a user and thinking how I

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455 engage with texts, I think there is something that's a bit of a... again, something that we potentially
456 miss. Let's say if you're presenting, if you were presenting a concept again, back in a design
457 setting, or just to take that experience, if I was presenting to a client what I've done, I don't have to
458 fear... I don't have to break my work up and then fear that I'm only going to get to focus on
459 presenting one part of the method but for... because the results part wasn't accepted, didn't get
460 through a particular gate, no-one would see those. So I know for sure when I go to my client
461 presentation that I have the full hour to present each of these parts, and then I can dedicate a
462 planned amount of time proportionally to each of those parts. I feel like within the academic work
463 because of the paper process, the paper writing process and the limitations within that, you break
464 your work into these small slithers and then you focus your time and energy on presenting pieces,
465 and then it's sort of a little bit up to again, the review process, luck, a lot of... it's as if you... the
466 analogy being that you go in and then that you're told just before your client presentation, "Okay,
467 but we're only going to be seeing slides four to ten and 16 to 20", and it feels then when I'm
468 reading... if I'm then on an audience side, reading text, I feel like I get some insight into a method
469 that I feel would be much more valuable if I saw that embedded with a complete picture of what the
470 output was. Then I'm reading texts about output where I don't really get a sense of how that output
471 was gathered, because unless somebody happens to have six papers on a particular study where they
472 manage to get all their thinking through, yeah, that maybe the efficiency would come into question
473 of how we are communicating the work we're doing and whether or not an awful lot of it might not
474 be getting lost, because even within probes from my side definitely, I presented... and maybe this
475 again is more of a beginners thing because it was the first time I was presenting a probes process, I
476 did not shine a huge amount of space on the bits of probes that didn't work. So I showed the probes
477 that got the most out, whereas if I was to be presenting honestly I would've also said, "I also tried a
478 couple of other activities but people didn't complete them", but again, because of space, and not
479 probably just space but wanting... thinking, "This will get published if these probes were
480 successful", versus, "Here's a paper on three probes that didn't work at all", whereas you could
481 maybe learn a lot more from the probes that didn't get so much return...

482
483 JEANETTE - That's a great point Eleanor, a great point. It just made me think of something as a
484 last minute paragraph in my thesis because we had... there was one probe that I thought was perfect
485 very, very early on like you say, a wearable camera, just the tiny little cameras, and that was a way
486 that they could record their day, and that, that's just like... some wanted to do it, others didn't, their
487 families definitely didn't want them to be walking around with a camera recording their day. But
488 that probably was a three month effort of looking at that, and I've got a lot of information as to why
489 that you wouldn't go down that path in that setting, but I've never done anything with it because I

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490 thought, “Okay, well we’ll focus on...” what we ended up doing, what did work. So yeah, I think
491 it’s a great idea actually, we should do a, everyone co-write a paper on all the bits that didn’t work
492 and why, what’s the thinking behind that? So in my setting it didn’t work, maybe in another
493 setting... and I know why, and it’s not my interpretation of that, it’s what I was told from them.
494 But yeah, I mean I think it’s been used in other settings, so yeah, I think that’s a great... I don’t
495 know, you’ve really motivated me to do something about that.

496

497 DAN - It makes me think, building on what you said Jeanette, and also what Karey said earlier
498 about having places where you could escape and it still be okay, well not escape, exit strategies
499 maybe and it will still be okay, that might be an interesting way to think about these things as
500 having, like, can you design even... so even if a probe, or whatever it is, doesn’t work in the way
501 you hoped but it still generates something that you can use that will be interesting, even if... I don’t
502 know. It reminds me there was, years ago there was a thing where we did... we try and do stuff
503 around how people used energy, how people understood electricity and stuff like that, and there was
504 an activity we’d imagined as a sort of warm up exercise, so we sent people these “probe booklets”
505 with all these creative things to do. It became clear that the warm up exercise we did of getting
506 people to draw what comes to mind when you think of the word energy was far more generative
507 and useful actually than most of the rest of the booklet that was about, “Record your daily
508 activities”, and all this sort of stuff, which people got bored of, they gave up on that quite quickly as
509 I probably would as well. But the bit which was the sort of thing we’d just gone, “Oh, get them
510 thinking about energy, draw what you imagine”, that was much more interesting and that led to far
511 more work subsequently than the actual rest of the probe that was supposed to be quite... well
512 didn’t go anywhere honestly, so few people completed the whole process of mapping their days and
513 all this sort of stuff that it wasn’t usable for anything. But the bit that was, you know, the info bit
514 was more exciting, and I wonder whether there’s more things like that where some tiny, I don’t
515 know, insights, like putting a frame around a page or around a box so people don’t feel they’ve got
516 to... it gives them a guide for how much to put in even, how much they’re expected to put in a
517 space, those sort of tricks like that seem to make quite a big difference. But I don’t know, because
518 they’re always incidental things you just notice, like, “Okay, that seems to work better when we do
519 that” or “Don’t give people so much space they feel intimidated but give them the...” you know,
520 those sorts of things, I don’t know, I’m rambling. But yeah, it definitely made sense the learning
521 from the things that haven’t worked and why could be really useful.

522

523 KAREY - I wonder if... I was thinking about... I’ve just lost my train of thought. Oh, it was
524 something about showing rigour in terms of how... because I feel like if Dan’s like, “We just drew

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525 boxes”, or how you, I think like, package it, because even if you don’t explicitly say things didn’t
526 work, if you still show this broad breadth and then implicitly you might be saying things don’t
527 work because you’re then saying, “Well we’re actually going to focus on X, Y, Z rather than E, F,
528 G”, or whatever. So I think there’s something yeah, there about how we build this rigorous
529 foundation at times to, I guess, position ourselves. But this also makes me think a lot about,
530 especially being a PhD student, who has the authority or the... I’m blanking on that simple word,
531 like you know, the hierarchy of who can also talk about failures, I think, is that I think as a PhD
532 student, I mean that would be still difficult for me even though I’m older, as in being later in my
533 PhD student to talk about those types of things. Whereas, I won’t say a name, but I feel like if a
534 professor came out there with talking... other people can also maybe have... and I don’t know if
535 through a knowledge of also knowing who to cite or how to position the work or also just them
536 being known. Then this also... I think, a thing I think about a lot especially relative to this first
537 paper of mine is how within the research community, which maybe how this differs than, also
538 seeing what Eleanor was talking about, the positioning of industry versus academia, is that the
539 research community, it’s... how it not just being about trying to further a particular field of
540 knowledge, but there’s also these internal research politics and conversations happening. So for
541 example, within my paper, and then been given the opportunity because I was interviewed about
542 autobiographical design, then I can further the conversation or participate in a conversation to
543 explain myself. I’ve recently, under submission, written about this project again and where I just
544 critique myself and this work that I’ve done as a way to again, I think it’s, yes, definitely I want to
545 contribute to a particular designers designing in certain kinds of context, but I also want, I think,
546 selfishly to say something more about this project that I’ve done and explain it a bit further. I think
547 that happens across... I think once someone was pointing out to me, it was some paper by the
548 Bardzell’s like, “Do you understand why they actually wrote that paper, it’s because they disagreed
549 with X, Y, Z from somebody else”, and I’m like, “Oh, okay”... I’ve really got lost there. But I think
550 there’s these conversations that are happening that aren’t just about generating knowledge for a
551 particular subject, but also kind of building, debating other things too.

552
553 DAN - Yeah, and there’s something interesting there about, just briefly, about the way that the
554 models for how things... there aren’t that many... well, I suppose there are lots of routes to
555 publishing things, but the few that seem acceptable don’t really allow you to build on someone
556 else’s ideas in a way that is not... you can’t go to a person and say, “Look, I’m really interested in
557 what you’re doing, I’m going to build on your work”, because it... well, I suppose you can do that.
558 But it has to go through a publication process where you know, anonymise, reviewers who maybe
559 are not as deeply interested in particular aspects of it as you are or as the people’s work you’re

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560 building on is. I think there's something there about the slightly odd abstraction, work has to be
561 abstracted into something that's relevant to everyone, or at least relevant to reviewers who don't
562 necessarily know that much about the specifics, or you don't know who they are, and then, only
563 then later can it become applicable again to a particular... I don't know, that doesn't make sense,
564 but you know what I mean, I think...

565

566 ELEANOR - Yeah, it's almost like probing the knowledge, the whole process is quite a bit
567 randomised and you have to do... it's a fair amount of energy to tie it all together and build your
568 own... Yeah, I think on the... I'm just thinking on... there's some, definitely some... on the
569 positive side, I think, having that academic kind of, like Karey said, that opportunity for dialogue
570 that doesn't exist in industry, it's so closed, it's like within the remit of my project and it's almost
571 like a slight, one company just almost wouldn't want to show... they weren't interested in what
572 they were doing because their company's more ahead or whatever. But I think that the... something
573 that I found... there was a... when it came to probes, it was really helpful to have, and I think that
574 would be with all methods, if I was going to be coming in as a researcher and going to a method,
575 the first... a way in for me to even start writing about the method, and I again, didn't intend to do
576 that, I submitted a paper on the method, and like I said, coming from that industry background, the
577 client once they had... they would come along to experience the method, they would not want a
578 huge amount of presentation time taken up by explaining the method. So writing about the method
579 was really new for me, and it was very vague for me to understand where the focus should be and
580 how to pare back findings, and that again, like I said, with that... it was really hard for me to know
581 where to stop and say, "We've made a contribution but I'm not going to go into the whole output",
582 and being able to actually extract that and frame it that it still made sense and was still
583 understandable to people and had a certain level for context but had this focus on method, the first
584 time didn't work. So it was unsuccessful and I had a reviewer recommend that I take a look at...
585 and I basically went back to the beginning and I looked at the design of my probes through a
586 framework that had been, that had already been put out there and that was a really useful way. So I
587 think... and even that, that was a huge... it was the word "framework", it's like another bomb went
588 off of framework, it was like, "Loosely a framework, not a framework, just some guidance", so that
589 was another one. But I think for methodology for researchers coming in, really useful to be able to
590 have frameworks with a caveat of, you know, allowing flexibility and for people to adapt them and
591 that these are not prescriptive, but to have formats where you're able to see what the... I just think
592 it's really... it's troubling that I've heard researchers who have then seen, or having published
593 papers on probes, hearing from people saying, "I'm going to use probes and I have no idea what to
594 do, would I be able to have a conversation?" and I think then something's going wrong in how

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595 we're writing about probes because that shouldn't be the case, it's decades of having a method. I
596 think that to have lost... in order to preserve a sense of you know, not wanting to pin things down
597 too much, to have people coming in who say, "I have no idea from reading 20 years of work, but
598 I'm still wanting... I'm still feeling nervous", and I think a lot of is nervousness. I think when you
599 see... Mattelmaki's book on design probes, I think when you look through that and when you've
600 had a first run at using probes, I think there would be a sense of relief of like, "Oh, it's actually not
601 that..." it's mystified a bit more and all the language around it, I think might make it feel a bit
602 more... yeah, that people are inhibited just to get in and do it and that would be not great as an
603 outcome I think.

604
605 R - I'm wary of the time a bit and I'm happy to continue if you would like to continue the
606 conversation, but if you need to leave at 10.30 maybe we should wrap up for some final comments.

607
608 ELEANOR - My final comment would be, and I think Jeanette... I guess from all four of us, that I
609 would say that something I would love to see a little bit heightened in terms of when I read about
610 probes, that I feel that I always try to get in there, is how... either if you are using probes yourself
611 or if participants have used the probes, how... to me the most important thing almost is how those
612 people felt their experience of using the probes was. So for instance, with this family study, it is not
613 the first time that I have been thanked for the opportunity for people to have the space to reflect on
614 things that they find have been really helpful for them. But I think sometimes the, less about what
615 they're putting into their probe, kind of how they're completing the probes, but more their
616 experience of it and if people say that they are grateful to have had that opportunity to complete
617 them, that regardless of if you can map what they've done to a particular thing, I think that's really
618 telling of the probe design, yeah.

619
620 DAN - That's a really interesting thing Eleanor. I mean I think that's partly what, I don't know, if
621 you can do something that people want to keep, if they've made something or if they've drawn
622 something or if they've noticed something, then they want to keep it because it's actually really
623 valuable to them, it's giving people a structure for keeping a record of their thoughts or their
624 feelings or things they do. I almost think that's, that's where it becomes... you have designed a
625 product in a sense, you've designed... or an experience in some way, and that's quite interesting
626 that, I don't know, yeah, where it becomes... it's not just an intervention to change the way people
627 do things, it has change the way people have done things or have felt about things perhaps or given
628 them an opportunity to reflect on it, but it's for them as much as it is for the researcher, and I think
629 that's quite an interesting area to, I suppose, value in a way. I don't know, what can you do, what

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630 can you create that actually gives people something that they've wanted to understand more about
631 their own lives or about themselves that is at least as valuable for them as it is from an external
632 research point of view. I would love to do more in that area because it's like... I don't know. It
633 seems like that's a good, I don't know, it seems like something that designers can do that... I don't
634 know. The projects here, all of them, I mean I guess Jeanette's, and well, Karey's in all different
635 ways, they're all about actually giving quite a lot of value to the people who are taking part in them
636 right, I mean it seems like that, or them finding value in it, or the project's been planned in a way
637 that it's not just about providing data to a researcher, but it's very much, kind of, I don't know, you
638 get something out of taking part much more than you would do in a survey or even in an interview,
639 or may... I don't know, maybe an interview gives... it's the chance for people to be heard, but then
640 you're still a test subject in some ways, I don't know. I'm rambling. But I mean yeah, I do think
641 there's something there quite interesting about that, yeah, where the value... can the probe itself
642 create value for people rather than solely extracting it, might be quite interesting.

643
644 JEANETTE - I think that's a wonderful point that you make Dan, and I never think you're rambling
645 because there's so much in there that triggers this thinking. Look, I think moving from... my
646 experience and my final word would be my learning's moving from medical science where it's
647 quite structured into HCI, I was so heartened that this space even existed and the humanity in this
648 research is incredible. I think I was really lucky to be challenged from the beginning with having to
649 close the gap between researcher and participant. There was no way I could stand in front of these
650 people and be a researcher, you know, new to this space with my L plates on and then I... people
651 joining me had backgrounds in law and still in their careers, scientists and... So I quickly realised
652 that I had to step back, you know, and just spend time in the beginning setting an environment of
653 trust so that I could get these conversations flowing before I could even think of handing them,
654 "Here, write down how's your day going", journal this and do that, you know, it felt so wrong. So I
655 think that yeah, again, my experience was quite confronting and I really hope that we can continue
656 to close those gaps, whether it be with children or any sensitive setting and marginalised groups and
657 we can drop the whole, "I'm the researcher and you're the subject", and just facilitate, use these
658 tools and artefacts, whatever they are, to produce stories that they're proud of. So like you're saying
659 Dan, something that they're proud of, whether it's a story or a design that they've contributed to,
660 but they know they've been part of that. Actually a piece of feedback for me was that to make sure
661 that I went back to them, and I still go back to them to let them know how this field is progressing.
662 Even HCI, they're all quite... they're really buzzy about the whole HCI space and they want to
663 know, they want updates, so, and that's hard, that's tiring and it's hard over so many years, but

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664 that's where I can help and give them that respect and autonomy and value in everything in the
665 project.

666

667 KAREY - I think my final point maybe is slightly different because I wouldn't... because probes I
668 wouldn't say are a big part of... that's a discussion, I might just leave out that word for my thesis
669 because I'm realising how much is within here. But I was thinking about how... sorry, I keep losing
670 my train. Every time I make some half-assed joke I lose my train of thought. Oh, I know, I was
671 thinking back, it wasn't that too long ago in our research lab how we were having a discussion
672 between knowledge generation... I can't figure out the exact phrasing, but what is it that a designer
673 in industry does differently than me as an interaction designer in research if I still consider myself
674 an interaction designer? If I were to go back to industry, then I would want to stay an interaction
675 designer, not a "design researcher" based on how that's packaged there, if that makes sense. So part
676 of the discussion was like, is it just because we write about it in research and we have these
677 publication channels through which our knowledge is filtered or packaged in certain ways, and if in
678 fact, the argument which I'm on the side of that an artefact is a form or knowledge, which I think
679 kind of complicates this. So I think within that if... under the thread of writing about it being the
680 key factor within academia, all the politics that come with using those words that, as Eleanor was
681 saying, are not in industry, you don't need to... I think, Dan also saying this, really strongly back
682 up, probe has this long lineage of blah, blah, blah, no, you just tell what you did and give those
683 results. So I think these politics with the words that we use, but I also think there's something with
684 these ongoing conversations and papers and how papers and these stories being shared and
685 packaged in particular ways, the life that they take, that's ongoing, it's not... even some ways it's
686 often positioned as being a final output but it's really not, which I think is also really interesting to
687 the politics of the words we use and how we I think position what we're doing, and I think probe
688 being a very great example of that.

689

690 R - So if I am to wrap up because I think we have only five minutes left, I'm happy to continue the
691 conversation if you like or we can also use the email. But to wrap up, some of the points looking at
692 my notes that came forward with all of your work is one, the invisible work around probes, whether
693 that critiquing yourself and the discourse around probes, whether that's the tensions between design
694 and research or the power imbalances in spying on your partner in Karey's case or working with
695 your own experiences of dementia and then with the participants in Jeanette's case. Then there's the
696 whole, this emotional work, ethical challenges that come with those as well, and then there are the
697 language games and policing of terminology, the gatekeeping and the baggage that comes with the
698 word as well and thinking about that, and that also is some form of invisible work, if I might put it.

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699 Then we... I think one of the things that all came forward with all of you was also leaving an open
700 space or escape plan as Karey said for failure or unexpected things throughout the process, so it's
701 the indeterminability of this whole process and how the method will work. Another thing that Karey
702 brought forward just at the last... and earlier Eleanor brought forward, was differences to industry
703 and academia and what's the focus, is it just because the knowledge generation and writing up
704 about it, or is it more like maybe the end goals of why do research around design or maybe even
705 opening up what counts as knowledge in both of these different practices. One way that could
706 maybe be forward is, from what I understand from the discussions, is that maybe we should explore
707 more opportunities to follow up on our existing works, whether the interview one following up
708 Karey's paper or maybe finding ways to contextualise a paper within a larger body of work to make
709 more... draw a more holistic picture of the whole situation. So that's my interpretation of what has
710 been talked about today. I hope I did not miss out on anything. After that I will share the video
711 recordings with you and also invite you to the writing up process, but before that, yeah, feel free to
712 make any comment if you have.

713

714 JEANETTE - I just want to say thank you Sena, thank you for bringing us together, that was so
715 engaging and interesting. I picked up things, I've learnt knew things in the last hour and a half and I
716 definitely have another paragraph to put into my thesis, so thank you.

717

718 DAN - Yeah, thank you also Sena and everyone, yeah, it's really... been very useful.

719

720 ELEANOR - I think even in the summary, that thing of invisible work, it's made me really think
721 about... I think when you asked the question, "What did you not put in?" and I was like... having
722 heard everybody, I've just realised there was a lot more that didn't go in that is either taken for
723 granted or you feel is not going to be seen as a productive aspect, and I think there's a lot that's
724 there that maybe... and again, it's one of those things you could keep just reading about certain...
725 you read about things framed in a certain way and then you expect to have to... you see the value
726 that's been valued, so then you tend to then frame it again like that and maybe you keep missing
727 this big piece of invisible work, yeah. For me, I think I didn't talk about it at the beginning,
728 would've been explaining to people so they know you're coming in talking about technology and
729 having to calm them whenever I could feel that... it felt like I was just trying to get them to talk
730 about the arguments they had in their relationships and that is all invisible work as well, it doesn't
731 go in to the... it's not seen as an output maybe, yeah. Yeah, thank you very much for the
732 opportunity.

733

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734 KAREY - Yes, thank you all, it's a fun way to start a Monday.

735

736 R - Yeah, thank you all very much for really taking the time to read each other's papers and also
737 join here today, and yeah, we'll be in touch, please feel free to keep the conversation going through
738 the emails and see you, have a good week.

739

740 JEANETTE - Lovely to meet (overspeaking)

741

742 ELEANOR - (overspeaking)

743

744 KAREY - Have a good week everyone. Bye.

745

746 DAN - Thanks, bye, bye.

CRG2 audio

R = Researcher

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34

R – Yeah. So I've started... Andy, would you like to start with your paper and your snapshot?

ANDY – Yeah. So I'm Andy Boucher, I'm a senior lecturer at Goldsmiths Department of Design but I co-lead the Interaction and Research Studio with Bill Gaver. We've actually worked together for... we only realised just recently, it's 21 years now we've been collaborating on research together and 15 years at Goldsmiths. We kind of have an agenda of exploring research and computational artefacts, kind of using research through design process. I guess the sort of snapshot of this paper is that this is a document or an account of a design of a TaskCam, which was part of a project called Probetools. Probetools were essentially a project where we were trying to make self-built electronic devices for using cultural probe studies. As you may or may not know, Bill is actually part of the team of people that kind of invented cultural probes in the first place, and so we've incorporated that into our programme of work for a long time.

I think this project came about – the idea for it came about in 2016 I think, maybe even earlier than that. We noticed that a lot of people were taking the concept of the original kind of wrapped disposable camera, we used to kind of create a wrapper that had very specific questions on the back. The problem with that is disposable cameras are obviously getting harder to get hold of and they're harder to process, quite expensive as well. A lot of people were doing studies using point-and-shoot cameras or smartphones. We felt that the problem with doing studies like that kind of detracts a little bit from the original spirit of the cultural probe camera. Of course, if you're using a point-and-shoot camera or a smartphone, there's a lot of editing that goes on. One of the beauties of the original camera was, it was... there was no way of anyone to edit what they took the picture of, you know? There's a sort of certain charm about that, particularly, you know... it means that you might not even get very good exposed shots, you know? But it doesn't really matter in many respects.

We thought that we'd reached sort of reached point with mic controllers and the availability of them and the cost of them, that we could probably design a completely self-built cheap camera which would do the same job and have the same functionality of a disposable camera. So really, this is a paper that is an account of that. I guess I'll just leave it there for now at the moment, and we can come back to some of the broader issues about it.

R – Arne or Heather, which one of you would like to go next? Arne, you take it. (laughs)

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35 ARNE – Hi, I'm Arne. I'm a professor of Human Computer Interaction at a small community
36 college in the middle of Germany. I do have a background in design and design research, and I'm
37 interested in or I'm very passionate about participatory design, especially being situated where I am
38 in Germany where a lot of HCI research is very, very efficiency-focused. I just thought this... at
39 CHI, I think we are the biggest language group. Still, it's only like efficiency stuff, it's really, really
40 annoying. I'm running a special interest group on participatory design in the German CHI
41 community, and that's kind of a very tiresome process. It kind of leaves the bit out of what I'm
42 actually interested in, in the sense that I'm a designer and I like to do co-design and I like to engage
43 with people in speculating about future home devices, about what a smart home could be. Not an
44 efficiency-based smart home, but one that tends to the quirks of... so if you think for instance of
45 how a home could be if it's not built on off-the-shelf sensors, that are like in off-the-shelf parts,
46 which are made available through smartphones, which is kind of boring in my opinion.

47 In this paper, I'm really curious that Sena actually was able to find it. It has a funny
48 backstory on what probes are because there's this German HCI journal, it's the i-comm, and I
49 thought no one would actually get past the pay wall. There's this joke we are having, that it's only
50 read by the German HCI professors because they receive a printout, basically. I think that's like 20
51 people reading it. Those people have been the goal for the paper, basically, because friends in the
52 third-wave HCI area in Germany were like, "We need to do a workshop and we need to do this
53 special issue on probes." And simultaneously, my colleague was naming the sensor toolkit, a probe
54 kit, and they kind of got one to one together, that yeah, that's a problem, that needs to get into the
55 journal. I was like, "Come on, people. We really need to think about whether this very technical
56 approach to sensors being hacks for exploration, if it's really a probe or if it's a toolkit." In my
57 opinion it was usually used as a toolkit, and that's what I tried to frame this paper, in whether the
58 empowerment aspect of giving people smart sensors is a toolkit approach and whether the open
59 exploration part is a probe approach.

60 I'm still puzzled whether it's either of them. I probably would lean in the direction of a
61 toolkit because you can frame, like, ideas and... yeah, you can basically build research products out
62 of it to be used as probes. Yeah, that's what I think I should end my reflection on.

63

64 R – Thank you. Heather?

65

66 HEATHER – Yes, so if I'm cutting out or lagging, just put it in the chat and I can turn my video
67 off. But hello, I'm Heather, I'm a lecturer at Queensland University of Technology in Brisbane,
68 Australia. Sena actually chose a different paper and then I swapped it for the one I put in. Yeah, it's
69 very similar, I don't know how you found that other paper, it's quite old. But the one that I've put

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70 in, basically, it was part of my PHD and the whole sort of... my interest was using design research,
71 design artefacts to explore this notion of sufficiency and self-sufficiency, and have a look at how
72 we can sort of explore different values that encompass that way of life, and then looking at how to
73 embed those values into the broader community. So this paper is pretty much looking at one of the
74 studies I did, I don't think in this paper I talk about it, but I use the term "design research artefacts"
75 because I think there's so... like, it's just semantics, I feel. If I did... because I did two prior studies
76 and if I did call something a probe toolkit, if I tried to get it published, the reviewers would be like,
77 "Well, is it probes? Is it this? Is this the intent for it?" You know, a lot of people in a participatory
78 design sense, a lot of my colleagues are into that, they would say, "This is called design things, a
79 thing to think with," like, there's so many different terminologies. That's why I referred to it as a
80 design research artefact.

81 But yeah, basically, this paper is a bit of an account of how I created some artefacts for 40
82 households out of rubbish, out of domestic waste that I collected, with a lot of help from colleagues
83 and neighbours. Collecting milk cartons, toilet rolls, teabags and everything, and then transferring
84 those into probe toolkits and sending them out, deploying them around the country and sort of
85 receiving them. Basically, this paper is just a bit of play by play on basically how it was made and a
86 bit of why. So yeah, I think that's probably an introduction.

87

88 R – Thank you all. Sorry for being a bit of an academic stalker in that sense that I actually went
89 through all of the probe papers, but I think now we can move on to the open discussion, so if any of
90 you wants to start with a question or a comment?

91

92 ANDY – I was interested in what you were saying about how you have to frame things in a
93 particular way in order to get it reviewed in the right context. You know, that goes to the heart of
94 Sena's first question; how did you make decisions in what's included and what's left out in
95 reporting for dissemination work? I think that is a good question because we've got a really high
96 failure rate with papers for... I mean, our target conferences are always CHI, DIS, or TEI... that
97 sort of... but quite a few are rejected. I kind of wonder why reviewers, particularly the design
98 researchers, why we are all so hard on each other? We seem to hold each other to very, very high
99 standards, at least with the reviews that I get, and I just think it's an interesting point. You do have
100 to be so careful about how you describe stuff. I mean, also Arne, what you were saying about the
101 HCI efficiency brigade, they always seem to review my papers! They always seem to dislike what
102 I've done. You do have to be really careful about how you frame these accounts.

103 It's interesting because I've not read this TaskCam paper for a while so it's interesting to
104 revisit it in some respects. Going through it now, I was almost quite annoyed by it, about how

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105 generically everything had to be written. That probably goes onto another point, your second
106 question. There's so much of what we're considering in the studio part of our research programme
107 that's not included, so you kind of end up with this quite anodyne and generic account of what we
108 did. Because it's a reasonably large project, you kind of have to touch on everything very lightly.
109 But reading it through again, I'm actually quite dissatisfied with it! I don't know if anyone else ever
110 feels that, with having to kind of tune stuff for the benefit of reviewers, without necessarily always
111 being able to kind of put down exactly what you think.

112

113 HEATHER – I think, yeah, I definitely agree with that. Reading both of your papers, as someone
114 who works in this medium, like, I know how much time was put into the development and how
115 much thought was put into each little bit of it, and what we present, like, it's sort of just the tiniest
116 narrative. There's so much more that had gone on behind the scenes that had failed, or, you know,
117 you're testing things or different elements. Yeah, I think making deserves its own standing in a
118 paper, like how it was made and why it was made, but a lot of those details... I know I've had to
119 sort of leave out because of reviewers, because they want more in the end or it's not enough to
120 explain how something was made or why you made it. Yeah.

121

122 ANDY – It's difficult. I mean, my background is in design and I think of myself as a designer and
123 maker that happens to be working this really odd context which crosses over into HCI. I totally
124 agree with you that it's really hard to describe making, but that's what 99% of what I do is, it's
125 about making. We wrote a paper called "Attention to Detail" for NordiCHI almost ten years ago
126 now, which we tried to really mess with the format and make it much more picture-based, and
127 describe the kind of process of decision-making in the design of a project called "Indoor Weather
128 Stations". It kind of sneaked through into the conference but it got absolutely hammered and
129 slaughtered during the presentation, the questioning was really harsh. People were saying things
130 like, "Okay, so what's the difference between what you've shown me and a drawing that my five
131 year old child has given me?" You know, "What's the contribution here, I just don't get it?" It's
132 like, our problem is we're trying to explain the process that goes into making it. A lot of people are
133 quite... I guess they don't see the point of it, perhaps. Or perhaps that's an issue about how it is
134 very difficult to articulate that to a non-making audience.

135

136 ARNE – That kind of reminds me of the hoops I had to jump through when applying for a
137 professorship here in Germany. All the design schools were looking at me like, "You're a definitely
138 a computer scientist?" because I do have a PhD in Computer Science and never wrote a line of code
139 in my life! All the computer science schools look at my portfolio and they were like, "What are you

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140 having a portfolio for?” so I’m kind of always in-between things. I think that connects to the
141 framing of how we struggle with getting papers into conferences while simultaneously connecting
142 to each other. There’s a bit more of a background story for my paper, there’s this... we expand a bit
143 on the egg-shaped thing of the sensor, and that was actually inspired by reading the Datacatcher
144 paper.

145

146 ANDY – Really?

147

148 ARNE – Because the Datacatcher paper was like, “We deployed 130 things,” and I was only half-
149 jokingly telling my team that we need to build 131 of those eggs, because I wanted to connect to
150 that narrative and to kind of connect to the way it would, like, be received in a reviewing and a
151 conference context. Simultaneously, it was also... I think we presented it at a CHI workshop where
152 you presented the TaskCam as well...

153

154 ANDY – That’s right, yeah.

155

156 ARNE – It kind of has a second layer of how I connect to it, which might not very much be the way
157 I put it into a paper.

158

159 ANDY – Yes, and that’s a really good point. This TaskCam project was the first one we did after
160 Datacatcher. The problem with Datacatcher, to produce 130 prototypes almost killed us and we
161 were just completely exhausted. We were thinking, you know, we’d been on this trajectory where
162 we would build a research product, well, artefact, prototype. We’d build one of them and we’d give
163 them to people to live with, then we started to make a few more and a few more. Then we came to
164 batch produce them and that’s when we got to the Datacatcher point, and we thought, “But we can
165 never kind of, we can’t really grow from here and it’s just really exhausting and really expensive to
166 try and do that.” That’s when, as a studio, we kind of made this shift towards trying to design things
167 that other people could make, so we could put our designs for research artefacts out into the world
168 for people to make themselves. The TaskCam was the first attempt to try and do that. That kind of
169 agenda, I mean, that’s something that continues now and we’re still doing these self-built artefacts.
170 None of that is discussed in the paper and that was such a significant part of our reasoning for doing
171 that project in the first place.

172

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173 ARNE – Well, I mean, if I'm connecting more of your work to that, I mean, the birdwatching
174 station, it's in the same way, right? So it's about scaling things up and with having built on BBC to
175 scale it up, it's...

176

177 ANDY – I mean, that was the whole point of that project as well, with the Naturewatch project, it
178 was taking that to the next level. How can we get as many people as possible to build a research
179 device that we've designed? It was literally like a set of circumstances, we were collaborating with
180 Rob Philips at the RCA, he was really interested in nature and we had this brainstorming session in
181 our studio about a project we could do together. I said, "Well, we can have this idea, but what if we
182 design something and we could get it on this BBC nature show?" We know if it has a huge
183 audience, prime-time, and then we can connect to a whole audience of people that have no normal
184 interests in research objects. But if we can persuade them somehow to make these things and then
185 we can get an awful lot of feedback about what it would be like for the regular public to engage
186 with a computational artefact which isn't driven by commercial agenda of Silicon Valley. So from
187 that, we managed to get funding, we got BBC to be a partner on it, and it was quite a risky thing.

188 Although the BBC agreed to support it, they didn't promise to show it on their programme.
189 We had to design something that they would be happy to show and, of course, eventually they did.
190 So that show went out to two million viewers and that night we set up a website with all the
191 instructions of how to build that camera. That night we had 20,000 hits, all that evening. It was
192 really interesting. If you show something to two million people, you know, about 20,000 people
193 might click on a webpage, we thought it was quite an interesting ratio there. I think that was almost
194 three years ago and we estimate that about 4,000 cameras have been made, which is a pretty good
195 figure to persuade someone to build... I mean, I know it's a fairly normative product, but it still has
196 aspects that we've designed into it which are not what you'd normally expect from a commercial
197 product. That's the kind of... I think that kind of level is going to be hard to hit again, to have that
198 many people, but it's been a really interesting process.

199

200 R – Okay. So maybe a question from me, some of you talked about when we were selecting the
201 papers, some of you talked about how the paper is old. Also with some of the other participants, I
202 had that similar discussion around how a paper on probes or in general design-led research ages, or
203 how you follow-up on that or what changes over time, so could you maybe talk about that?

204

205 HEATHER – I think – I know I definitely said that mine was old and I had... oh, I don't know if I
206 have an answer. It's more like I just have done more studies since and obviously, each time you do
207 something, you lay out on your knowledge and you learn something and you even try something

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208 different. Even going back to old papers, it's almost like looking at teenage photos of yourself a
209 little bit and thinking, "Aw, I know more now." I guess it does... I don't know, like anything you
210 do, I think it does age purely from more experience or changing approaches, things like that. So I'm
211 not sure I have too much else to say on it.

212

213 ANDY – Well, it's part of the design process, I think, isn't it? That you're always moving forward.
214 You do something, you learn from it and you do the next thing. Sometimes it's... I find it quite hard
215 to look at old work sometimes. It's an interesting feature of academia, you can always actually call
216 upon to reflect on stuff that you've done. I mean, in the UK at the moment, we're going through for
217 research assessment exercise, which is something that the government does every eight years or
218 something, where you have to kind of collect up and catalogue all of your research outputs to be
219 assessed. We're just going through that process of going through all this old work and I'm thinking
220 it would be so nice if you could just get rid of it and not have to have it constantly brought back,
221 and having to re-explain it the whole time. So yeah, for me, I just see it as part of the normal design
222 process. You do something and you move on from it, you learn from it. You take those learnings
223 with you, but you're not... I rarely look back on something that we've done and think, "Oh, that
224 was brilliant." I always see the things that we could have done better.

225

226 ARNE – Yeah, the "I could have done it better" is a feeling most designers are quite familiar with.
227 I'm kind of... the notion of it being old, I kind of connected to Sena's third question about
228 disseminating design research, and I think in looking at the three papers we're having here, some
229 are "old" in the sense that they are three years old. I also increasingly connect to the research I am
230 reading about and the research I did myself more like a travel book, like a diary over time. I kind of
231 remember that I visited the Everyday Design Studio in Canada and I remembered them having the
232 woollen TaskCam standing there, which I didn't know was in the paper but it connects me to that
233 loop of being there. I have a very vivid memory of the tables where Heather was laying out stuff
234 from her work and it was... I don't know where I saw it, I've been at QUT as well, but I don't think
235 that I, like, saw it, but I have a very vivid memory of that.

236 It kind of connects into a stream of what my design decisions will be, and if I'm looking at
237 my own work and the work I'm connecting myself to, which is not in a very "academic" sense, very
238 strict, but more of a stream of conscience like I'm talking right now, is that it makes sense if you
239 look at it through, like, a travel diary, basically.

240

241 ANDY – Yeah, that's interesting.

242

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243 HEATHER – It's funny, because thinking about the second question, about why we leave
244 motivations and factors out of the published accounts, it's almost like... yeah, it's like as a
245 designer, the things that I want to know all about, the materials you've used and the things you
246 played around with, you know, what you learnt from it... all of those things that I actually want to
247 know, it's sort of... they're not in the papers because they maybe don't fit or, you know, it's too
248 much waffle or that kind of thing. I was just thinking about, you know, looking back and seeing
249 what you've learnt and what you'd do better, that warrants a whole discussion on its own. But how
250 do we frame that? Where do we put that? All these lessons learnt, yeah.

251

252 ARNE – And it's also a question of, at least with my work and my framing in the efficiency-
253 oriented German HCI community, it's also the difference between what interests me as a researcher
254 or me as a designer, and what I as a researcher feel my obligation to report. In looking at CHI
255 contexts, in looking at the efficiency brigade, I kind of have the feeling that I have the obligation to
256 tell counter-stories, which I kind of sometimes feel a bit boring, but it's a fitting narrative that can
257 convince people to do better and that's better in airmarks because that's a normative statement,
258 because maybe efficiency is awesome, you know... There's also a mismatch between what we can
259 talk about right now, because we feel we are the design research bunch at this, and we did other
260 work and we are kind of connected through similar interests. What we report outside, what Andy
261 was referring to there, like, how the government looking into how your research was conducted.
262 You have to tell a different narrative or you at least believe you have to.

263

264 ANDY – Yeah, it's interesting, isn't it? I wonder how much, like, you know, every time I go to
265 CHI, I always hear people talking about how that community has embraced design for so many
266 years. When I think about how different my experiences of people's... I mean, obviously, there's a
267 group of us that are design researchers, but there's also a group of people that would describe
268 themselves as designers, but who seem to have no interest in making at all. They're both kind of
269 that... those kind of stories of how things are produced, seem to fall on deaf ears or there just
270 doesn't seem to be quite a lot of interest in it. Heather, looking at your paper, I'm really drawn to all
271 those images and I just want to see more. You know, I want to see more of that materiality there,
272 which is so kind of compelling. It's really hard to kind of find formats to get that information over,
273 in a way.

274

275 HEATHER – I think maybe even it comes down to, there's so much emphasis in a publication on
276 what is your contribution, and like, really refining that, really stating that. That's something that,
277 you know, reviewers always come back with. Their contribution is not strong enough, like, it's one

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278 of the things you're told to evaluate, this contribution based on your opinion. So yeah, I think it's
279 about making a new design, a contribution in itself, you know? It's something new, it's something
280 unique in itself, new materials or a new way of looking at it, you know. I loved the bit, Andy, in
281 your paper, how you had the zero-waste participants and so you were looking at creating paper
282 mâché covers, I could just imagine all the work that went into that, and all the different thinking
283 about, "What materials could we use? What could be recycled in the end?" But you know, if you
284 wrote a whole paper on that in itself, you'd just get hammered about, "What kind of contribution is
285 that!?"

286
287 ANDY – That's an interesting point. I think on most papers now, we do kind of almost explicitly
288 state, to kind of highlight and say, "The design itself is also one of the contributions." I don't know
289 if that helps or not but we've had to do that because we've had so many reviews back that say, "I
290 don't see it." A typical review will be like, "This is really fascinating work, really like the thing
291 you've made, but I don't see what the contribution is." Well, the thing is...

292
293 HEATHER – Yeah, it's hilarious. Then you've spent months and months and months working on
294 that one thing like it was nothing, almost.

295
296 ANDY – Sena, do you want us to talk more about probes?

297
298 R – No, I'm actually more interested in you just talking about the papers and asking each other
299 questions. But I do have certain questions, for example, some of the things you have said kind of
300 makes me think about all the invisible work around probes and, kind of like, in some ways, that
301 could be read as sometimes, as sort of gatekeeping around design research know-how. How we can
302 open this up a bit more to also... because earlier on, Heather said we need to leave room for failure,
303 especially in experimental making, there is a lot of room for failure. Most of this does not get
304 recorded and therefore it becomes this invisible, made-implicit kind of work that also confuses then
305 the reviewers, who are often non-making audiences that cannot really see the value of that. You all
306 talked about that and I'm actually really interested in hearing about this more, how we can find
307 ways to maybe make this more visible in our publications, whether exploring different formats or...

308
309 ANDY – I think in some ways, that was kind of one of the intentions around the pictorial format at
310 this, and I think subsequently, that's been taken up at TEI. But I don't know whether... I mean, I've
311 done a fair bit of reviewing for it, but I still think that... I think, unfortunately, that format is often
312 used when people have had a paper rejected and then they kind of, like, they image something up

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313 and take a few words out, rather than using it as a format for describing that making process. I think
314 people are just very cautious about submitting that kind of work because they've probably just been
315 rejected so often, which is a shame. I think it would be good if, certainly, some of these conferences
316 had proper making tracks where you could describe the process of making something and you could
317 describe all the different failures. With the TaskCam paper, I think that front page has got two
318 different – a paper-based case and an ABS-printed case, and I think each of those versions probably
319 took about 100 iterations to get right. I don't think we speak about that at all, but that's a huge part
320 of the process and a huge part of the time, to get something to function on a really robust level.

321

322 HEATHER – Yeah, imagine if there was a track at DIS or a workshop or something, that it was
323 about just talking about everything that you'd made that had failed. Like, how interesting would
324 that be, and why it failed. You know, was it because you ran out of money? Was it because you
325 didn't have the equipment? Was it because the design itself just didn't do what you thought it
326 would do? All of that, we can learn from each other so much. I would attend that workshop!

327

328 ANDY – Yeah, that sounds like good fun, actually. I've certainly got a lot I can bring to it! A lot of
329 failures.

330

331 ARNE – Well, I'm definitely very, very positive about sharing through making what we did, and I
332 remember, I think, Laura Devendorf, she had this 3D printer that kind of was herself and she was
333 guided. We saw her 3D making something in real-time life at the workshop. That kind of reminds
334 me of how important it is that we still need to explain these qualities of design in the sense of what
335 the mindset around building and making is, because that's the thing that's both neglected at CHI,
336 and also neglected in the way our society is shaped around. We need to scale things up, we need to
337 make things more efficient, there is the efficiency argument again. I think, and we still have Google
338 and potentially Facebook financing our conferences, though the argument might be to whom are we
339 talking? A lot of time it's expected that we are talking to people that build more things more
340 efficiently and scale things up to sell them made cheaply in China.

341 The question is, if we as a designer, maker or audience were interested in the process of how
342 we are doing things and we reflect on each other, will that have an impact on society? Or will that
343 only help us to feel more understood? I mean, which is also nice in itself, but... I am going with
344 that.

345

346 ANDY – Yeah, it's an interesting point. I think Laura Devendorf's machine was... I seem to
347 remember it was a cake printer.

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348

349 ARNE – Yeah, I think it was meant to be (overspeaking)

350

351 ANDY – Yeah, I think it was making a cake or something like that. Food-based printer. Yeah, it's
352 an interesting point. I think that the CHI conference does kind of worship the altar of efficiency of
353 Silicon Valley, doesn't it, in a way. It doesn't like to kind of... well, certainly, most things are
354 presented in terms of how, like, amazing everything is, rather than how... I mean, as a kind of
355 conference that's to do with research, you'd think there would be much more discussion about
356 things that go wrong, or the things that went wrong on the way to making something go right, you
357 know? That's also kind of, in some ways, even if it's a kind of... you think an engineering process
358 is also about making mistakes and it's interesting that kind of that group of people don't seem to
359 really want to kind of explore the process, in a way. It's always about the outcome, it's always a
360 very polished outcome.

361 I mean, it's a classic kind of presentation, isn't it? You listen to some work and there's
362 always that style at the end, it's like the five takeaways, points of the future, which I always think is
363 quite funny because I don't know if they ever get built upon. I never kind of get to the end of my
364 work and think, "Oh, here's five takeaways."

365

366 HEATHER – Like quick and snappy, here we go!

367

368 ANDY – Yeah, like they've been focus grouped to death, you know? I always feel that that's a way
369 of always guaranteeing... I mean, maybe I should try it because it seems like it might be a way of
370 guaranteeing that something's accepted no matter what your process is or what you've made. Five
371 very clean takeaways.

372

373 ARNE – Personal confession, I totally streamlined and adopted the CHI paper narrative with, "This
374 is our contribution, those are our five takeaways," and leaving nothing open. That kind of gets CHI
375 papers accepted.

376

377 ANDY – I will try that!

378

379 HEATHER – Let me write that down, yeah.

380

381 ANDY – Did you notice a discernible difference when you started to do that? That it was suddenly
382 easier to get things in?

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383

384 ARNE – Yes. And for me, for a totally unknown name from East Germany, it also helps having a
385 famous name on your paper. It's horrible and disgusting because the same paper got accepted after
386 someone was on name with his or her name on the paper, so I take those venues and those
387 narratives as, like, just another narrative in the way I present my work. That's why we have the
388 Research Through Design conference, where we can touch things. This is why we have the CHI
389 workshop where we touch things, and this is why at the German HCI conference, I'm running a
390 workshop on participatory design, because everyone in the... all my colleagues think that's totally
391 bollocks. It's kind of an issue to have a number of narratives in your head to attend to, like, in
392 parallel, but it also helps you to be seen from different angles, and I'm not sure if that's a bad thing.

393

394 ANDY – Yeah.

395

396 ARNE – Sorry to be that (inaudible).

397

398 R – So it sounds like there's a lot of issues around making and emphasising the contribution of
399 making, and therefore maybe manipulating your narrative or the citational practices to make
400 references to previous examples. Do you have maybe final comments on this or other things?
401 We're also short on time now.

402

403 ARNE – I think with all the papers on probes, in particular the two papers from Andy and Heather,
404 there are a lot of things that shine through that influence me quite a lot. In Heather's work, there is
405 the notion of it has to be able to be posted and I would really be interested in how that worked out
406 because there is a lot of hassle around that. With the TaskCam, there is a lot of... there's also the
407 notion of posting, you send the TaskCam to Canada, I think it's very inspirational for me in the
408 sense that because I'm a designer and you are designers as well, your issues are shining through
409 those half sentences.

410

411 ANDY – Yeah.

412

413 ARNE – And that's kind of awesome.

414

415 ANDY – I suppose that's a good point, yeah. I get the same from reading both of your papers,
416 there's these little things and you think, "Oh, yeah, okay, that's interesting, I can relate to them
417 more about that." And the posting is a huge issue... sorry?

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418

419 HEATHER – Oh, no, sorry. I think I'm a bit delayed. Yeah, the posting is a huge issue, you either
420 have to... just all of that, the practicalities of it all. I forgot what else I was going to say. Give me a
421 sec. Keep going and I'll see if I can think of it.

422

423 ARNE – I have a probe stranded in Lancaster for a year now.

424

425 ANDY – Really? (laughs) How did that happen?

426

427 ARNE – It was a travelling suitcase with a research product in it, and I brought it to Newcastle one
428 and a half years ago, and it should travel through the UK. Then when Covid hit... it's still currently
429 in Lancaster. Now they can't really send it back because of the Brexit and stuff!

430

431 ANDY – Oh yeah, that's made everything really difficult.

432

433 ARNE – It's got batteries in it, so it's potentially dangerous. So yeah, posting, we should have a
434 paper sending probes around.

435

436 HEATHER – Yeah, I remembered what I was going to say. Just thinking back to that time where I
437 was trying to make them all and send them all out, and just thinking of this invisible work, as Sena
438 put it, all this extra work that you can't even really talk about that much. What we're expected to
439 talk about is what came of it. We put all this time and effort into the making, which I know what
440 we're talking about, but is it worth it? Is it valued enough that all that time and energy spent on that
441 is greater than... sorry, it's nearly 9pm here, it's been a long day! Do you understand what I'm
442 saying? Is it worth it?

443

444 ANDY – I get what you're saying.

445

446 HEATHER – Yeah, and then you get to a new study and you design something new, and it all starts
447 again. There's just so much in it. Clearly I see the value of it which is why I do it and it's fun as
448 well, but in terms of... yeah, I don't know, I'm just going to stop there.

449

450 ANDY – I think creating anything is really difficult, isn't it? Making something come into the
451 world and share it with someone is a really difficult process. I think that ultimately, that's the
452 struggle of getting something out, it's very difficult to convey to people that don't do that, you

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453 know? You kind of hear that in all sorts of other creative professions as well, people talk about how
454 difficult it is to make a movie. The amount of people that work on a movie and how hard people
455 have to toil on it, and then they stick it out and reviewers just say, “Nah, it’s rubbish.” You know, it
456 must be devastating to work on something like that. The act of making stuff is hard, it’s really hard.
457 There’s so much work that has to go into it. It is really, really hard to kind of convey that. Maybe
458 that’s just the price of entry to be able to do this sort of stuff.

459

460 HEATHER – It’s almost like... you know, all the behind the scenes footage that used to be on a
461 DVD in the menu, you could see it all on that. It’s almost like, how could that be incorporated to
462 how we publish or talk about it? Here’s what happened, but the real things or... you get insights
463 into different aspects of it, yeah. That’d be good to see.

464

465 ANDY – Maybe there’s way of doing annotated papers, maybe you could kind of read it with the
466 comments switched on, or track changes or something. Or a director’s commentary of the paper,
467 perhaps. “This is the paragraph I’ve written but this is what I really mean, what this paragraph
468 actually summarises.”

469

470 ARNE – I totally can relate to that. I have a million ideas how to do that with the ACM Library
471 where you can upload a video with a pictorial, that’s your take-outs of the director’s cut in addition
472 to the paper. Because there’s quite a lot of creative capability in our work to bend those venues into
473 telling our stories.

474

475 R – Any final comments or maybe questions for me? I think I have some good comments all in my
476 notes.

477

478 ANDY – I guess I was wondering if you could just say something about what your general PhD
479 topic is? I guess it’s to do with probes and things, but what specifically are you exploring?

480

481 R – Yeah, so I mean, probes, obviously are a very open to interpretation concept and they have
482 been widely interpreted. But at the same time, as designed artefacts, they are also part of very
483 designed processes as you have mentioned, they have been somewhat methodised in HCI
484 especially, and there are some mis-citation practices as such, so I think putting those in the larger
485 picture of, also, the discussions around RtD and its legitimacy in HCI again specifically, I think it
486 offers a great way to explore some of these so-called tensions between design and research or
487 contribution of making, as you have been emphasising in this conversation. I’m rather interested in

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488 what is actually going on, and these things are often not reported in the papers, and I chose to talk to
489 design researchers that have especially worked with and published on probes to explore some of
490 these issues and what's going on, actually, in the background. What's being made implicit, why is
491 this happening, what are the implications of that for design-led research practices? This is what my
492 research is about.

493

494 ANDY – Cool.

495

496 HEATHER – That's great.

497

498 R – Thank you. Yeah, I think we can wrap-up now. So yeah, I'm happy to continue the
499 conversation via email and after that I will be inviting you to take part in the writing-up process as
500 well, if you would like to. I guess the conversation will continue even more then. Apart from that,
501 once the study is finished, once all the four sessions – this was the second one and there will be two
502 more next week, so by the end of March I will share the video recordings with the larger group. I
503 have no idea what's going to happen but we will see, there will be lots of emailing back and forth, I
504 believe, so sorry for spamming you!

505

506 ANDY – No problem.

507

508 HEATHER – Go for it.

509

510 ARNE – It's a great process, with all the pandemic stuff. I mean, it's great to involve people like
511 you do. I found it very engaging and a worthwhile conversation right now, so I'm looking forward
512 to being part of it. I like your approach, I really like it.

513

514 HEATHER – Yeah, me too.

515

516 ANDY – Best of luck with it.

517

518 R – Thank you. Have a very good week and thank you again for taking part.

519

520 ANDY – Thank you.

521

522 HEATHER – Bye, speak soon.

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523

524 R – Bye-bye.

525

526 ARNE – Bye.

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R = Researcher P = Participant

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R - Yes, we are now recording. So maybe Enrique, would you like to maybe start with your paper and yourself?

ENRIQUE - Yes. Well thank you very much for inviting me. I have to say I was really, really excited about this and I think it's one of the highlights of my Corona times and Corona blues and all these stuff. I have been following all of your work actually, Britta and Doenja, I have... perhaps we haven't met. I think Doenja, we met in DIS, in the ACM meeting last year, so it was my first time as an AC, doing pictorial stuff. So at the same time I'm a little bit nervous because papers... or I don't have done much experience discussing papers because... and it's something that I hope we can talk about later, but it almost feels like when I write about design research, my brain goes into a certain mode, but when I'm designing the brain is in a different mode and then I will work like the two papers that you have submitted and my brain is constantly switching in between the designer mode and the reviewer mode trying to figure out how do I negotiate this tension between creativity and criticism and I kind of get a little bit nervous. So I really don't know how this is going to go to be honest, because we are used to talk about the papers in terms of presentation, but I think so much get lost in the process, and I think Sena, the questions that you posted us when you set up the whole group were spot on in the sense of what is it that you decide to leave out and how do you negotiate that stuff. So I don't know very well where to go about the paper because... would you like me to... Sena, can you throw me a question and I think it's probably... do you want an overview of the paper or the motivation, or what is it that you will be most interested in?

R - I mean I have questions of course but I think for the time being we can contextualise it, as in why did you do that study and is there more publications rather than to that project or that specific probes or metaphysical workshops and some very brief thing for us to understand what actually happened?

ENRIQUE - So what happened... in the one liner is I'm always trying to figure out what is the research territory that design can access and the research territories that design cannot, and I always try to draw that line and then try to figure out can I go there and use design as a tool to investigating that particular territory, right. With this paper... I also think that probes, and starting with the cultural probes and all that stuff, it's almost like a rite of passage for a design researcher, or at least it was for me, because in a sense the whole conceptualisation initially of the probes by Dunne and Gaver at the very beginning, I think it totally opened up a different conceptualisation design can do,

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36 and it was very easy to grasp from a designer perspective of can I design to know, not to sell, not to
37 buy, not to beautify, can I design to know? That has inspired me throughout my whole PhD and
38 during my master et cetera. So the paper that I present here, it was very much... or it started
39 because in my PhD I was very interested in the role of design fiction and speculative design and
40 critical design et cetera, and at some point during the PhD I thought, "But can I actually investigate
41 what fiction is through design?" Suddenly my research started to take this philosophical twist, so
42 the reading material suddenly started to be more... to philosophical perspectives and I started going
43 into more and more obscure sources that I never thought I would even touch with a stick and
44 suddenly it became super interesting and then I started thinking, "But can I actually design stuff to
45 know more about what these people are talking in these language that's relatively inaccessible for
46 someone that doesn't have the training in philosophy like I do?" So that was the motivation for the
47 paper, and it was also, the paper is also a consequence of my PhD and it was developed with my co-
48 authors. I mean I have to say I did most of the heavy lifting, so this is one of those papers in which
49 your co-authors are there supporting and helping you in the process, but their input is not that
50 transformative and that was very much my choice too because I felt I was exploring a territory... so
51 they kept my sanity so to say. It was not the paper in which, "You write this section, I write this
52 section", it was more like the threading, they were helping me a lot with the threading, with the
53 framing with the... et cetera. Yes, is that good for now because I can go on?

54

55 R - That is good, I think we can come back to those later. So maybe Doenja or Britta, Doenja,
56 would you like to continue maybe?

57

58 DOENJA - Yeah, sure. Thanks Enrique, I recognise a lot of that, the surprising philosophical twist
59 where you're getting stuck in that and you're like, "Oh, wait, this is what I'm doing now". But
60 yeah, so I'm Doenja, I did my undergrad and masters in the Netherlands and I grew up in the
61 Netherlands and now I'm getting towards the end of my PhD in Vancouver where I'm working at
62 the Everyday Design Studio and working with Ron Wakkary and Will Odom. Yeah, and our
63 studio's really fun, we do a lot of collaborative projects, so it helps to get you away from the
64 solitary of PhD life and Corona life, so I really appreciate that. This was one of those collaborative
65 projects, the paper that... or the pictorial that you've picked Sena, which came about in a really
66 funny way, it was the first summer of my PhD, still just searching for what we were doing, then
67 Will had come back from CHI I think and he had a really interesting workshop where he met up
68 with Bill Gaver and Andy [Boucher], the people from Goldsmiths and they were working on their
69 ProbeTools and they needed a case study. So they gave us the cameras and they were like, "Can
70 you try them out?" and so we were like, "Okay, well what should we do with them? Let's build a

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71 probe study around it”, so that was a funny way to start a project. But yeah, in general the Everyday
72 Design Studio has done just so much work on home life and what is a home, what does it mean to
73 design for the qualities of home. It was a very collaborative project with Will this one, and we were
74 just discussing and I’m like, “Yeah, but these homes that we always say in HCI are not really the
75 homes that I’ve lived in at all”. So we tried to push that a little bit and really look at different homes
76 and tried to find people who were living in yeah, what you could call alternative housing. So we did
77 a probe study with people living in vans or on boats or in really big collective houses to see what
78 different values that would give for a design, and the probes are really tailored to that as well.
79 Yeah, and then my PhD is about something completely different. No, there’s actually one page in
80 the pictorial which was funny to get back to which talks a bit about connectivity and how that’s
81 different when you’re on a boat for example, and we have some speculative proposals of tuning
82 connectivity, and that’s related to what I’m doing now. But yeah, my research currently it’s more
83 about textiles, textiles for the home or making, for example a woven Wi-Fi antenna, which will be
84 some sort of flag or banner connected to your router so that your internet has a bit more of a
85 presence in your home instead of tucked behind the couch or behind your curtain or something to
86 see what that does. Yeah, and I’m trying also to think about different forms of communicating
87 design research because I recognise that struggle of going back and forth into, “This is how you’re
88 supposed to write a paper, but this is how you’re supposed to design”. So yeah, and yeah, I’m really
89 excited to do this reading group, also a little nervous, but if we all are nervous I’m sure it will be
90 fine. But yeah, your research is so exciting because probes are very intriguing artefacts and just
91 looking across all our papers they’re so much different, and it’s all probes, so I don’t know, I’ve
92 always had questions about probes and it’s this thing that’s been around for so long and everyone
93 knows it but no-one really knows it either, it’s just this funny in between design thing. Yeah, I was
94 very intrigued too to read the speculative aspect of all of our papers, which I think is going to be
95 interesting to discuss as well, yeah.

96

97 R - Thank you. Britta, would you like to continue?

98

99 BRITTA - Yeah, sure, sorry, I was just taking notes. Yeah, thank you both and again, thank you for
100 being patient. Yeah, I’m nervous, everybody touched about this as well. I liked... a lot of the things
101 you said resonated with me. I found it really interesting when you talked about the philosophical
102 area. I was very surprised that my PhD took me into the methodological... which was nowhere
103 where I wanted to go at all. So the paper you read was the first I wrote in my PhD. So before I
104 wanted to look into smart home technologies for people with dementia and I thought this would just
105 be one way for me to go a bit deeper into that topic and to find out a bit more in a designerly way,

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106 and then it completely changed the topic, because from then on my PhD was about design fiction
107 and how the hell do we actually evaluate that, because that was a conversation I then had to have
108 with my supervisors and I really struggled to explain it and I think we will touch on some of that in
109 relation to probes as well, and I think Enrique brought that up in the email of, “How do we actually
110 say this a good probe? What makes it... and who gets to decide that?” which was then the question
111 I tackled in my PhD. So the idea in my PhD is that I want to take design fiction out of the
112 showroom approach, I want to take it in the lab and into the field. So we have these gorgeous
113 artefacts, and I absolutely acknowledge that there’s knowledge in the process, in the artefacts
114 themselves, I’m at no point negating or debating that, but I think they are so useful, which is why I
115 wrote the “Homes For Life” story and have since then discussed that with various people and got
116 their responses. Then I had the pleasure of working together with a master student from TU
117 Eindhoven who developed HawkEye, which was the follow up paper which was a tangible probe
118 that actually lived with people for a week so they could experience the tensions of caring for
119 someone through smart technology, which is really interesting in that it’s basically the same and
120 completely different. So yeah, I think I’ll leave it at that for now and looking forward to see where
121 the conversation takes us.

122

123 R - Thank you. So if anyone wants to start with a question or maybe an individual reflection on
124 their own paper please feel free to do that.

125

126 ENRIQUE - Maybe we should all unmute our microphones and see if it works.

127

128 DOENJA - Unmuted.

129

130 ENRIQUE - I’m trying to... I mean I have so many notes, that’s the thing I don’t know where to
131 start. So perhaps with a comment that Britta said before, what is a good probe, and I think that’s
132 something that I also thought a lot with doing my stuff because I don’t know what I... perhaps I
133 know and I don’t want to recognise when I know that you are recording me saying this, but maybe I
134 know what a not so good a probe is, and I think it’s the whole other side of using design probes as
135 methods for evaluation or as a way of eliciting or creating some kind of quantified ethnographic
136 account for example. I think that’s... and I think knowing that I was not going in that direction is
137 what allowed me also to suggest these kind of... for my paper with these probes, because if you
138 think about it, what I’m proposing in the paper is kind of contradictory in a sense, and I did it on
139 purpose because there is also these... you see now it’s because I’m jumping into so many issues of
140 concern within design research. But what I’m noticing, and that also connects to where I’m based

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141 now, and I'm based now in computer science department that has an interaction design education
142 and I'm in the interaction design education, but I also... so of course most of my context, academic
143 context comes from very different traditions of what is considered as valuable knowledge. So my
144 struggle, or the struggle or why I don't think in the current department where I am, they have very
145 much... they don't find it that easy to see the value of this paper is that they always try to look for
146 what is the problem that you are solving in a sense. You can see... something that I notice in the
147 three papers, in the three of our papers, one thing that I found in common was how much attention
148 and space in terms of words we use for constantly reminding the reader of the value of what we are
149 doing...

150

151 DOENJA - Which is not always fun to read, right, "Just tell me what you did".

152

153 ENRIQUE - Yes, exactly, "Show me more stuff", when I was reading, Doenja, when I was reading
154 your paper I was thinking, "I want to see more, I want to see more of the responses of the artefacts,
155 of them coming out".

156

157 DOENJA - Yeah.

158

159 ENRIQUE - But we need that space or otherwise the paper doesn't get in because the reviewers
160 always say, "Yes, but what is the contribution?"

161

162 DOENJA - Yeah. I think what's so interesting with probes, and I picked up this question too
163 because in your paper Britta, I think in the strengths and weaknesses you mention that weakness is
164 that it wasn't... that the probes weren't evaluated yet, and that really got me thinking, and I guess
165 that's also prompted your further research. But yeah, I was just thinking, "What are probes for?"
166 and for me they're really a tool for designers they're not really to communicate research
167 necessarily, it's like... at least how we use it, it was within the project and it's still on that edge of
168 communicating insights from a certain community but not... but that's designerly insight, not as
169 this is a claim we make about people who live like this, it's all like, "Oh, this is interesting, let's try
170 and design for them", kind of very loose input. But then I started to think about that more and I was
171 like, "Are probes arrogant? Is it a design tool where designers are like 'I think this is what they will
172 like, let's see. Oh, yes, they do, now we're going to design this'", so I got a little bit conflicted
173 about it in the end, because I always have a lot of fun designing probes, because it feels like a way
174 to get your assumptions out of the way as well, you're just trying some stuff out and maybe that's
175 good that there's a tool for that as well. But yeah, recently in a course a student wanted to evaluate

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176 their probes by doing a user study with it before actually deploying the probes to the users that they
177 wanted to work with and I was like, “This is getting very meta and not in a good way”, because I
178 was like, “How would you even... what would they have to do to be good probes then in the end?
179 They would have to inspire you as a designer, or what is the output that you’d get from them?” But
180 then obviously you can’t just go blindly in designing probes, so yeah, it’s a complicated thing.

181

182 ENRIQUE - Or isn’t that the leap of faith that you have to do in a sense with the probes, that is
183 when you put yourself... when you have done all the research and have the literature or you are in
184 the process of exploring that while designing the probes and then you need to do that kind of
185 jumping which you have to express it in a design way creatively so to say, and you know you can
186 say in any creative endeavour. So I totally understand your hesitation with the, “Can we test the
187 probes before we deploy them?” because then you go on the other side of the pit in the sense of,
188 “No, no, the users said this”, so...

189

190 DOENJA - Yeah, exactly.

191

192 ENRIQUE - Yeah, so interesting.

193

194 DOENJA - But then the real evaluation of a probe would be the eventual design that comes through
195 it or something or the...

196

197 ENRIQUE - Right, yeah, what is the evaluation of the probe? So my paper, there is another
198 difference, or Britta, maybe you can... you know more about this part of evaluating or how you do
199 you consider the... because you mentioned before you were interested in evaluation, no?

200

201 BRITTA - Yeah, yeah, I am, and I think a lot of this comes from exactly these conversations we’re
202 having, and, so my PhD was all situated at a school of computer science and I quite often felt like
203 the only designer there. So there’s a lot of heavy lifting to do isn’t it where you... should I say, you
204 have to do that in papers and you have to do that when you explain to someone to say that, “This is
205 what I’m doing, this is why I’m doing it, this is why that is a good thing”, even though it might be
206 very different what you’re used to. I think part of my PhD work was trying to bridge the gap
207 between the two, because I think it would help if the two came more together, I don’t know what
208 the two positions are, but I call it the computer science-y position for now, you know what I mean I
209 hope, we can dig into this later, and the designerly position where it’s good to bring, I would say
210 it’s good to bring some of the ethos of design of this, taking this leap of faith but as you said, into

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211 the work you're doing, giving up a bit of control that you're having, being able to be critical of your
212 own work potentially. But computer science, people who do computer science are not designer, nor
213 do they want to be. So how do we yeah, explain to them what it is that we're doing without
214 watering down the tools that we have been building up? I think to some extent that happens and that
215 would be... one thing I would say is a bad probe or not so good probe is one that's really
216 uninspired. You sometimes read these papers and they are so much like the original cultural probes
217 that they just basically took this as a one to one and then maybe or not they evaluated it and tested
218 it. So I always have that with... I also try to do that with design students that I teach in project,
219 depends on project, and I introduce them to probes, I say, "Do something", and it's so hard to get
220 them to think creatively and that's a great way, Doenja, where your paper comes in because I think
221 you're using that so often in courses to tell people not only what might be out there in terms of
222 other forms of living, but also, "This is what probes could look like so have a go at this". But
223 yeah...

224

225 DOENJA - Oh, that's good to hear.

226

227 BRITTA - The question of evaluation is... it's all of that.

228

229 DOENJA - Yeah.

230

231 ENRIQUE - Yeah. I think my probes are the only ones in the group, in this group that we are, that
232 were not intended for other people, so I think the meta probes are quite arrogant in that sense. I was
233 thinking a lot about it when I was doing it, because I was going against this grain that probes are
234 about, or the original cultural probes were based on this idea of exploring the cultural space of
235 someone else, and I was feeling that I was doing it to explore a metaphysical space very much on
236 my own. So that was another inconclusive thing that I haven't been able to reconcile, can probes
237 still be probes if you use them for your own design process or does that...

238

239 BRITTA - That would be the autoethnography through probes or something like that, yeah.

240

241 ENRIQUE - Yeah.

242

243 DOENJA - One thing that's interesting about probes is that it's a verb, it's more about... it's a thing
244 that does something, it's not like a chair, or, it's a very active naming for a thing, so I feel like
245 whenever it does that... I don't know, you always get a feeling when you see a good probe that it

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246 does that, I don't know, this is the movement [makes a digging gesture], that kind of digging into it,
247 or literally probing. So yeah, I feel like you can do that on yourself as well if you're open minded
248 and willing to... but yeah, it would be interesting to see if that would work with your computer
249 scientists for example, Britta, would they be willing to probe themselves, or, in a literal sense of the
250 word. But I don't know, if you look at the different forms of our probes across the papers, I think
251 it's very much more in an attitude rather than it is in a specific artefact, there's more of this
252 questioning and yeah, I mean which is very present in speculative design as well, but maybe it's in
253 a more sketchy form still in a way, like sketchy speculative design.

254

255 ENRIQUE - Yeah, totally agree. I mean what Britta said in her paper about exploring matters of
256 concern versus exploring matters of fact, and that's very much what probes do very well, really,
257 really well, and because of the nature of that exploration they have to take this... they are (inaudible
258 - audio interference) in that sense. But then that brings you to the other side, which is something
259 that I was feeling... that I also was doing very much with my paper is that the whole idea that if we
260 could conceive of these metaprobes, of designing to explore a metaphysical space, I tried to make
261 very clear that it couldn't happen on its own like other probes do in the sense of... and maybe it's
262 because I was trying to look for some form of legitimisation of this kind of design work, but that's
263 the whole idea for the sketchy philosophy and the metaphysical work, is the idea that if there is a
264 metaprobe you have to make visible, even if you could, tangible, the philosophical perspective you
265 are coming from, and how do you do that, because now you do it... we do it mostly with text and I
266 had to spend two pages there talking about (inaudible) and object-oriented ontology and things like
267 that, which is super boring in terms of design. So now what I'm doing is I'm giving you... yeah,
268 I'm again justifying myself on the grounds of the philosophy I'm using, which is something that I
269 kept thinking while I was doing this, "Well I do it this way, because it's the only way I know", but
270 maybe there is another way, well Doenja, what you were saying about the pictorial format, or...

271

272 DOENJA - Yeah, I was very curious on everyone's thoughts on that, on probes and pictorials in
273 general if there's a... for us that was so... that was the only way we could do this research, we were
274 like "We have too much to show to put it in a paper", and you're right Enrique, we still didn't show
275 everything, there's still editing and stuff. But yeah, I think yeah, I was wondering if either of you
276 considered publishing parts of this or thinking about what this would look like in a pictorial format
277 and what that means for disseminating?

278

279 ENRIQUE - So the problem is that in many institutions and it's a coincidence that all the
280 institutions I did my PhD because I moved a little bit around, I couldn't get funding for a

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281 conference if I tell it's a pictorial, I could get it if I tell it's a paper. Even now I mean that... the big
282 change that this is bringing about is equalising the value of the pictorial and the paper, and that is
283 huge, I think that is huge. But it still needs some convincing, like here I still need to... they asked
284 me for papers and this approach and it's very focused on this kind of output, and when you need to
285 justify... could I do a pictorial, yes, but the problem is a pictorial takes perhaps more work than a
286 paper, I would say to make a good pictorial, because the whole labour of illustration and graphic
287 design that goes in there is very huge. The problem is that people that, co-authors for example, they
288 don't see this, and that has been my struggle this year for example, I tried to make it really visible
289 when I was working on the pictorial to show them, "Look, I spent three hours designing a proper
290 layout because... otherwise it's not going to fly", or... [notification sounds] sorry about this,
291 people... So the reason why with the metaprobes I didn't go pictorial was very much an
292 institutional constraint.

293

294 DOENJA - Yeah, that makes sense. Yeah, what you're saying about the work on a pictorial, it's
295 also more difficult to collaborate, you can't just work on it in Dropbox or something, like there's
296 one person who puts it together in InDesign... and I feel like you have different writing styles, but
297 if you use different visuals, it's even more clear if there's no continuity.

298

299 ENRIQUE - Yeah, exactly. So what I did this time with my co-authors is we got together and they
300 would be on the writing side and I would be telling them about typography and why these fonts
301 don't work together and, "Do you see this and do you see why I'm trying now?" That's so
302 interesting also because (inaudible) you have to share with them the labour that goes into graphic
303 design, and all that labour is invisible for the large chunk of the academic community that
304 traditionally publishes papers.

305

306 BRITTA - I'm going a bit bonkers here while we're talking because I find that so interesting, all the
307 work that goes in pictorial graphic that is basically design work, this is putting yeah, your thoughts
308 not into words but expressing them in a design way, making them visible, making them tangible in
309 a way. I was just thinking that you know, how we do fictional abstracts and fictional papers for
310 design fiction, have we ever thought, or has anyone ever thought about using a pictorial as a probe
311 (inaudible - audio interference)

312

313 DOENJA - I think you've froze but right at the... excellent moment, it kind of emphasises your
314 point. Oh, you're back.

315

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316 ENRIQUE - You're back.

317

318 BRITTA - Sorry, where did I skip out, my internet is breaking?

319

320 ENRIQUE - I think in the part of could we use pictorials as a probe.

321

322 BRITTA - Yeah, I just said not as a way to communicate about a probe but actually as a probe, so
323 it's something that we give out and say, "This is a probe, use it", and figure out what that actually
324 means to people would be a really interesting thought (overspeaking).

325

326 ENRIQUE - Yes, I have tried, Britta in a sense I have tried, but the problem is, the problem is that
327 also, and this is one of the, from my point of view, one of the big hurdles that the pictorials are
328 going to need to overcome, we need to find a way to do that, and it's that people that usually read
329 papers and are not familiar with close reading images, they look at images and they don't spend
330 time in the image, they look at the image in the same way that we would look at a banner in a
331 website or you will be scrolling, so they take the pictorial and they look at it, they read the words
332 and they are like, "Hmm, read, hmm, read", they don't stay in the image, so to stay, like designers
333 do...

334

335 DOENJA - Visual literacy.

336

337 ENRIQUE - Yes, the visual literacy problem yes, I really think so. I really think that's a really big
338 problem which is... I remember in the last DIS AC stuff we were talking who was it? Eli, yeah, I
339 think Eli [Blevis], I think he said something about a pictorial with no words. The problem why it
340 wouldn't fly is because you can spend ten hours or I don't know, maybe ten hours too much, but
341 you can spend three hours on an image, carefully designing it so it aligns with that idea that you
342 want to throw out there, and then you post it in an image and it will be great that people read it and
343 spend a fraction of the time that they spend reading the same page in a sense, that you stay with that
344 image. But we don't have that culture in academic, in the academic practice, we don't have that
345 culture of staying with that image for a while and now you look at it in terms of composition, and
346 now you look at it in terms of form, and now you look at it in terms of different meanings, and now
347 it's about the metaphors, and you go through all these layers, peeling off what the image means. But
348 we... not many... I haven't found many people that does that, especially non-graphic designers on
349 this one design.

350

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351 DOENJA - I feel like that might be the same problem as what you were mentioning Britta, with
352 students not... just copying the original probes, it's that lack of being able to see that work and then
353 being able to do it, it's the same yeah, visual literacy problem, I think.

354

355 BRITTA - But I think it's also something that also... it's a design problem in general, or a general
356 problem of how design is perceived isn't it, it's the question of do you see this as the end goal or do
357 you see it as something with... as a means to an end. So I can look at a designed object and I could
358 spend hours with it and my thinking, "How well is it made? What's the motivation? What does it
359 actually do? How do I feel about this?" or I can think, "This is a great tool to do X", and then you
360 go away and do X. Yeah, I think it touches on the same kind of problem or the same
361 communication barrier that we're having or that we are facing sometimes when we're talking about
362 design and speculation and all of this with people who might be interested in the best case, hostile
363 in the worst.

364

365 ENRIQUE - Yeah. The problem is also that the hostility is not too apparent sometimes, that is... or
366 what I have encountered with the problem of visual literacy is that it's more hostility by way of
367 dismissal. It's like it flies under the radar, but maybe we're going away from the probes. Sena, do
368 you want to... sorry.

369

370 R - No, I think it's all right, I mean there are really some interesting things that are coming up, so I
371 don't want to really intervene and you're already covering some of my questions anyway, so please
372 keep talking.

373

374 BRITTA - Venting our frustrations. I wanted to pick up on a point someone mentioned earlier about
375 speculation and probes and I found that really interesting because that's something I really hadn't, I
376 hadn't really brought the two together, but I think now that I see the three papers next to each other,
377 yes, that's absolutely right, they are definitely critical I'd say, but they're also kind of speculative in
378 again, in very different aspects of what they are trying to do, so I think that's something that just...
379 that I'm just understanding now as we're talking about it.

380

381 ENRIQUE - Yeah, and the first probes by, it was by Dunne, right?

382

383 DOENJA - Yeah, that's the stamp of speculation right there, stamp of approval, yeah. I think in a...
384 yeah, I've always seen probes as speculative, but I've also always seen sketching as speculative, so
385 I don't know, I think I just have speculative blindfolds on or what do you call them, the side folds

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386 for design in general where I'm like, "Everything we do is speculative, because it doesn't exist yet".
387 But I think the difference with our, the three papers next to each other is that they're all yeah, please
388 don't take this as offensive, but humbly naïve in sort of like, "Let's see what happens", or "We
389 don't know enough about this yet so let's just really step back and try a different approach or ask
390 some really different questions". I realise I just called probes arrogant and now I'm saying that
391 they're humble, so clearly I'm confused about them, but maybe they're both. I guess there's
392 something yeah, I guess there's something humble and arrogant in being willing to just commit
393 to... what you said Enrique, the leap of faith that you're taking with probes, you're asking a
394 question through a story or through an artefact and then you have to really write the story and really
395 make the artefact to actually ask that question. So that's maybe... that's the commitment you make
396 as a designer to go through that process and to make the things, make the probes, but the question
397 itself is I think humble. It's all questions where you don't know the answer to either, which I feel is
398 different with a lot of other HCI research. A lot of research has questions that people start and
399 they're like, "I know what's going to come out of this".

400

401 ENRIQUE - They proved the hypothesis kind of thing. I have another hypothesis for that Doenja
402 and Britta, the issue of how probes are related to speculation in our work, and I think the reason is,
403 or one of the reasons, but I'm going to throw this down, I think it's also because as academic
404 designers we take the opportunity of designing as trying to go beyond the establishment of design,
405 because we can in the sense of we don't need to fulfil for example market demands. So when we do
406 the probes and when we have findings, why should we try not to be speculative; what would it
407 mean not to be speculative? It would mean... so for example, not designing for the future, right.
408 But in most... many of the designs that I see, so for example, in both of your papers many of the
409 stuff I saw might be placed in the near future, but it could also be an alternative present in which
410 counter-factual stories suddenly developed (inaudible) different. So it's... the way I see it in this is
411 that you are taking the possibility of design in terms of what can be in a sense that it doesn't need to
412 align with the establishment of what design should be, and that might be a reason why we always
413 veer into the speculative, because we can, and because it also... It's very... just think about it,
414 Doenja, in your project you have all these findings about people living and constructing at home in
415 different ways that are totally, or sometimes radically opposed to the way design works in designing
416 for the home. So when you need to mobilise all your insights or generate ideas et cetera, the effort
417 to realign with the normative assumption of the home, it would be an extra mile that you had to go
418 and why did you do that?

419

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420 DOENJA - Yeah. Yeah, I mean it's I guess also because we don't have stakeholders in our project
421 which would put those constraints on us I guess, yeah. Yeah, one step that we never really... we did
422 a follow up on our probe study where we worked a little bit closer with some of the people and
423 further developed our speculations and we presented them as Amazon ads and something to try and
424 fit into existing, yeah, tech infrastructures I guess. But it felt, yeah, it felt a lot more constrained
425 already to do that work, whereas here it was just very freely speculating for sure. I guess that
426 freedom is a big part of speculative design, and we did actually show the pictorial to a few of our
427 participants, now just coming back to the point of pictorials as dissemination, and for them it was
428 such an academic publication still, which is funny because in academia it's the opposite I guess,
429 "But for them they're like, "Okay". The first couple of pages there's still a lot of framing and text
430 and related works and they're like, "Well yeah, we know that we live like this". So yeah, that was
431 funny. I think for them, too, the speculative proposals that we actually did were like, "Well no, we
432 don't want a van that sense what we're doing". So the designs in the end were really not for them,
433 which is why I'm like maybe they're arrogant, maybe probes are a little bit arrogant just to
434 communicate... you're exaggerating... at least what we did was to make a point to HCI, we were
435 trying to exaggerate these perspectives as well to really let them lend as being different to what HCI
436 have been doing. I think speculative design is maybe sometimes a little bit... it does that to make
437 the point, to yeah, show the alternative in a more extreme way, it exaggerates and it might not, in
438 our case it might not always be what the people who we worked with would actually want.

439

440 BRITTA - I think that it's absolutely interesting this... it's going back to the question between
441 being arrogant and being humble. I think probes, like speculation, are quite arrogant or privileged
442 let's say, because they work outside these constraints, they are not necessarily for a purpose, they
443 are not the right way to get to something, the most direct way, they actually taking a round about,
444 taking a bit of... the scenic route. But they are also as you're saying, humbling because they do that
445 because they see a need for exploration, they really... they come from a position of wanting to
446 learn, of wanting to understand, so I think that's some of the tension.

447

448 DOENJA - Yeah. It also comes back to what's a good probe or not, thinking about that again now
449 I'm like... it's fine if a probe gets resistance or if people are like, "No, that's now how I see that at
450 all", and I wonder with your stories too Britta, there must have been some resistance of like, "That's
451 not the future we want". So I guess a bad probe would be just something that is yeah non-inspired
452 or that it's just not engaged with at all. You can get a really exciting creative response, I'm thinking
453 about ours now again, but we definitely had a few things in our probe bag, too, that they just didn't

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454 click and we just didn't... there was nothing, and I would say that's probably a bad part of the
455 probe then, there's just no response, yeah.

456

457 ENRIQUE - I like that.

458

459 DOENJA - But then thinking about that now I'm like, well I don't know, we didn't leave it out of
460 the pictorial, because we didn't get a response to it, we still... yeah, it was still part of the probe
461 package, maybe it was more of a filler thing or something.

462

463 BRITTA – Well, I mean they can be yeah, interesting stuff in those round about ways isn't it? So
464 we had one student project where the student developed a probe and, so it was about finding out
465 about the living situation in shared flats to see if there's some design solutions that can be applied to
466 that context. So they made a game, which they also did a couple of pictures here and did that, but
467 the interesting part of it was they asked students to... that they developed a truth or dare game for
468 the whole flat share community to play and engage with some really cheeky questions. One of the
469 things we found out is that people actually did not answer the cheeky questions, they all did the
470 daring, yeah, they all did the daring set, so they volunteered to wash the dishes for two days instead
471 of having to slag off their... So the game didn't work at all as it was... as a probe. But I think
472 sometimes this not engaging or avoiding is also... can be quite telling in how people interact with
473 it. Also in what you were saying earlier, in questioning our assumption of what we think might be
474 interesting for people to talk about, it was like, no, it really that much.

475

476 DOENJA - Yeah, probes, that's a reality check. But yeah, I guess... I wonder if that's... since
477 we've been talking about what we can publish and what is respected and recognised as academic
478 contribution, did you publish that work or did you write about the work Britta, about the non-
479 engagement? There's work on non-use and stuff but I wonder... there's not a lot on studies that
480 didn't really get the insights we wanted.

481

482 BRITTA - No, we didn't, maybe I should. I'm trying to get the paper out to talk about the artefacts
483 that came out of the research, because they're actually quite fun and quite critical, I was quite proud
484 of the computer science teams to do something that actually didn't solve a problem, that's kind of a
485 big deal. But yeah, maybe that should be a paper in itself, maybe together with some other case
486 studies to find out the things that yeah, that didn't work out.

487

488 DOENJA - It's harder to write about I think, harder to get to motivation for.

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489

490 BRITTA - Definitely.

491

492 DOENJA - Yeah, success stories are easier to write I guess, although I like the way you're framing
493 it, that this engagement was still an insight and a success.

494

495 BRITTA - There's a wonderful paper about monitoring technology for people with dementia where
496 they wanted to do a case study for... where they used a tracker for a week and the couple decided
497 after one day that they were done with it, and they actually didn't, didn't do the study but I'm so
498 glad that these people sat down and wrote a paper about it because there's so much in there about
499 the motivation as to why they couldn't be bothered, it's just brilliant. So yeah, there's... we
500 definitely need more failure stories as well.

501

502 ENRIQUE - Yeah.

503

504 DOENJA - Yeah, we actually had one participant in this probe study, it's been a while but it's all
505 coming back to me now, that she was the first one that we recruited and she was the zero waste
506 person and, so definitely really inspired... we were recruiting at the same time as we were
507 designing the whole kit, and, so she really inspired our whole material approach, because it just
508 didn't feel right to give her plastics or something, it didn't feel respectful. But yeah, we gave her the
509 probe kit and she still has it, we've never gotten it back, and, so in a way we don't know what her
510 responses really are and that didn't make their way into the speculations, but we still had a whole...
511 we still had a relationship with that participant where we emailed back and forth and she had a
512 really big influence on the probe study, just not in the actual data I guess, or, the probe response
513 never came back but there was still... yeah, it still worked itself in.

514

515 BRITTA - Did you found that... did the probe work for everyone still though, or did you find some
516 hesitant for example in other participants?

517

518 DOENJA - No, I think we had a good variety of stuff in there, so. I mean there was one participant
519 who really used the camera a lot and the other I think is a little bit less, and then one participant
520 done a really fun job on the tins and they didn't really work for other participants. So I think there
521 was a little bit for everyone in there and not everyone did the whole probe set, but yeah, from the
522 ones that we returned there was something inspiring in all of them.

523

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524 ENRIQUE – Don't you think that maybe... I'm thinking also now how this idea of failure is so
525 interesting, that there is some notion of performance involved in the probe that you demand of the
526 people that you give the probes to, because I notice in one of these metaprobes thingy, the second
527 version, the one that print the points, we also had people that were... I mean on all sides of the
528 spectrum of happiness with the probe from some people that started even acting out, even taking the
529 fiction, building it together even further away, "Oh, this is why it's bringing this point to me and
530 blah, blah", and the other one saying, "Yes, it's a salad, a word salad from LinkedIn, what do you
531 want it from?" I think there was something about the performance that the probes demand of
532 people. I think that's also one of the reasons that sometimes they might fail too because some
533 people don't like to play or to play in that way.

534

535 DOENJA - Yeah. No, I think that's a good word for it, performance and yeah, creative
536 performance, or, yeah, which is... yeah. I'm thinking about how we recruited too and we posted
537 pictures of the probes which I think really helped people to see what kind of study it was, because if
538 you post like, "Oh, we're doing a study about the home" on any Facebook site or any group or
539 whatever, I think a lot of... studies aren't always... maybe comes across as a little bit just boring or
540 something, I don't know, or, "Yeah, I'll participate in a study", and then they think it's a question
541 list or an interview, or. So yeah, maybe some sort of transparency in recruitment of what you
542 actually are going to do, and it's very different from what other studies might ask from participants.

543

544 ENRIQUE - Yeah, also it's a little bit like some... okay, I'm talking without thinking too much. I
545 hope there can be some (overspeaking)

546

547 DOENJA - That's up to Sena right, analyse what we're saying, see if we're making any sense.

548

549 ENRIQUE - I am just spitballing here. But it made me think of the "Design Noir" book from Dunne
550 and Raby, were those probes? I would argue they were, to be honest. Do you remember that project
551 which they designed... maybe I can show you, design by... So it was basically... because I was
552 thinking about the process of recruiting participants (overspeaking) and when I read this book really
553 a while ago with the nipple chair, do you remember the nipple chair?

554

555 DOENJA - The nipple chair?

556

557 ENRIQUE - Yeah, it was a chair that had...

558

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559 DOENJA - Nipples.

560

561 ENRIQUE - ... nipples that would vibrate when there was electromagnetic radiation going on
562 around it. I can share.

563

564 DOENJA - Googling it.

565

566 ENRIQUE - Yeah. So can you see?

567

568 DOENJA - Oh, yeah, yeah.

569

570 ENRIQUE - Right, can you see my screen, yes?

571

572 DOENJA - Yeah.

573

574 ENRIQUE - So this is the famous one, the one that is in the cover and all the stuff, this is the nipple
575 chair. But they developed seven or eight of this, the one with the compass, the table with all the
576 compass and stuff, right, "The Placebo Project", that's the name, "The Placebo Project". So the
577 funny thing with "The Placebo Project" is how they found participants too because they went into
578 that... I wanted to read a little bit how they found it, and they found it very much putting ads in
579 magazines too. So I was wondering... there is some sort of curation of participants (overspeaking)
580 for the probes. Or I don't know, maybe the curation doesn't really happen, you can never do a
581 proper curation of participants or not, but, I don't know, because if the probe is such a high end
582 element of design, so to say, the engagement of the people with that probe might be different if they
583 actively know beforehand what the probe is going to be and that it comes from these designers, do
584 you know what I mean?

585

586 DOENJA - Yeah. Yeah, I think our case we were also just lucky that the people who live in those...
587 on a boat or in a van, at least the ones we talked to were just also wanting to promote their lifestyle.
588 So they had this active... I wouldn't say it was activism but close to it, they were minimalism is the
589 way... there was just these aspects to it that they really wanted to talk about, which helps. But I
590 wonder with the, yeah, with the Dunne and Raby work you're pointing out, it's furniture, so I
591 wonder what the specific people were that they wanted to talk to. I guess there's a point of
592 specificity that you need for studies maybe to...

593

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594 ENRIQUE - Yeah, or maybe that process of curation can really... allows you to really choose
595 people that are very comfortable with the performance part of the probe.

596

597 DOENJA - Yeah.

598

599 BRITTA – Well, yes and no. So I would bring in a counter example where I did... well I started a
600 study last year in February I think, so before Corona started, where I talked to professional
601 caregivers about intimacy in the care home, so how they felt closeness to the residents in the home,
602 and I gave the people cards that were a bit between probes and a diary, and I'm not going to the
603 discussion of whether a diary is a probe or not and everything's a probe. But, so they were cards
604 with open prompts to fill in that they had for two weeks, and unfortunately it was only two
605 participants and then I had to stop the study because of things. But those two was... they didn't
606 expect this at all, so we told them that this is university study and so on, I briefed them, and the
607 feedback I got in the end was so positive about not having been given a survey or (overspeaking)
608 well we also interviewed them, but just having something nice and interesting. So it's not like they
609 took part because they wanted to do a probe, they just thought... it was a bit more I think closer
610 related to the activity, they really wanted to talk about caregiving, because that's something they
611 felt strongly about and they wanted to share that, then they were surprised by, but also appreciated
612 the tools we gave them to do that. So I have to say the performance aspect you were mentioning I
613 think was quite low in this because they... it was a couple of words that were on a piece of paper
614 so, that we then talked about, so it's not like we asked them to get out of their comfort zone here,
615 yeah. So I wanted to make a point with this now I've completely forgot which one it was, I hope it
616 becomes clear in the recording.

617

618 ENRIQUE - I think what you say about they wanted to have something nice, I don't know if you
619 phrased it like that but that's what I maybe understood, in the sense of... like the idea with the
620 probes is the fact that you are designing someone's house or domestic environment for a while in
621 the sense like, "Take this and keep it where you keep everything you live with, and then we come
622 and ask you about it", it's, you know what I mean, it's intrusive, it has an intrusive aspect to it that
623 is very much worthy of being designed. So my colleagues here they designed a probe before that
624 was called, that they called "The Box", there is a DIS paper about it too, and the thing is that you
625 can see that the Danish home is, from all the places I have lived in I would say that the Danish
626 home is one in which... that pays a lot of attention to design more than in other countries that I have
627 lived for example, in Spain people might not be so concerned with how the table matches the lamp
628 and stuff like that, but in Denmark it happens very much, and even very young people spend huge

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629 amount of money in designer sets of... from cutlery to, I don't know, it's normal that a graduation
630 present for a high school student or a bachelor student is a lamp. It never happens in Spain, or at
631 least not in the part of Spain I'm in touch with perhaps, I don't know, high levels... But what
632 happen is that they designed the box and obviously the box didn't... I don't think it was up to the
633 aesthetic standards of the Danish home that they sent the probe to. So the probe ended in the
634 washing machine room, under the sink, stuff like that. Again of understanding that sense that not
635 because of the fact that it was badly, or it was not designed as it should have been designed or
636 certain level of quality of stuff, but more because when you make a probe that you are sending into
637 someone's house you are assuming a degree of responsibility there, a sense of they are going to
638 have to live with this. There is a (inaudible - audio interference) yeah.

639

640 DOENJA - Yeah, I think that's a really good point. I think a big part of, I mean designing in general
641 but yeah, the probing as well is just, yeah, a matter of respect for the people that you're working
642 with too and trying to understand that and trying to be respectful of that relationship.

643

644 BRITTA - It's the arrogant and the humbleness again, it's kind of, "Here, I give you this very
645 intrusive thing but I made it as pretty as... or as suited to your lifestyle as I can".

646

647 DOENJA - Yeah, "And now you have to live with it", yeah.

648

649 BRITTA - "Then tell me all about it".

650

651 DOENJA - Yeah.

652

653 ENRIQUE - Yeah, that's also a question... a good point Britta, how much... then you should
654 design the probes to fit the life of the people, the recipient of the probe. Yeah, I guess that's one of
655 the design constraints depending on what is it that you're investigating with the probes.

656

657 BRITTA - Yeah, maybe that wasn't separate, but I think they can match the lifestyle. I think some
658 of them, for example, the nipple chair or some of the Dunne and Raby stuff is a bit more... goes
659 into the direction of breaching experiment. I think the work on HawkEye that I did with Renee
660 really was in between, because it was so pretty and it was designed to have the lowest effort on the
661 participants, but then again it asked them to imagine a person and caring for that person, so it was
662 really taking them out of their comfort zone and asked them to step into a completely new world.
663 So I think there's... maybe that plays into the discussion again that we had earlier about the good

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664 probe, I think a good probe maybe lies on the tension of that, so it asks people to come out of their
665 comfort zone but not all of it, it's not something that sticks out like a sore thumb but it more wedges
666 its way in, which might be worse come to think about it.

667

668 (19 seconds of silence)

669

670 R - Any final comments given that we have 15 minutes left?

671

672 ENRIQUE - Let's see.

673

674 (22 seconds of silence)

675

676 ENRIQUE - Yeah, perhaps I got... bring back this comment I made at the beginning and ask you if
677 I you feel something like that, like when you were reading these papers do you also feel that your
678 brain is going into different modes?

679

680 DOENJA - I don't know if I had that one reading the papers. I was really reading the papers with
681 probe glasses on, but I definitely had it in our discussion just now, I want to go and make a probe
682 study now, and then I'm like, "Oh, no... I got to write a research paper". Yeah, I think it's been a
683 very interesting discussion about just designerly struggle of being an academic.

684

685 BRITTA - Yeah, I think my struggle is always... it goes a bit further in the question of am I a
686 designer, am I a writer, am I both, is this actually design fiction if I just write, do I have to... and
687 then that's... I don't know. So as I was saying earlier, this is the paper I wrote at the beginning of
688 my PhD and now I wouldn't be too sure of this study is a fiction or a probe or nothing at all, so
689 that's what academia does to you, you start to question everything.

690

691 ENRIQUE - Yes.

692

693 DOENJA – So this was a support group more than a reading group. Much needed I might say.

694

695 ENRIQUE - Yes, yes, totally. So I had a comment Britta about the design fiction work, one of the
696 things I loved about your paper, also my first paper in my PhD was also a written design fiction and
697 what I loved about your paper is that it was three pages of the fiction, of the story, I really liked it. I
698 really liked to go into not the imaginary because there is a bunch of ways of doing... of writing

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699 design fiction and the times I have done it, except for that very first paper, I always had to
700 economise the space and either I write just a snippet of a story or a fragment or something like that.
701 But I really liked the fact that you can really immerse in the story and that then is when you get the
702 nuance of the... and when you can get the ambiguity and when the story is not either moralising or
703 deductive or something like that and it's something... But it made me think of if perhaps... how
704 would it be annotated, because I was thinking, I don't know, I was reading about annotated
705 portfolios the other day, and then I was thinking perhaps these design fictions in terms of academic
706 work could be annotated in a similar way.

707

708 BRITTA - I'm trying that in my PhD, I have a page in my thesis where I take the five design
709 fictions I have there and then try and take the key words or the key themes as a way to find the
710 common ground of what I think, "What have we actually learned through this activity?" My PhD
711 supervisor did not get it at all. With the "Homes For Life" paper, the other struggle I always have is
712 that I wanted to start with the fiction, put it at the... so have the abstract, then have the fiction and
713 then explain what it was all about, and I didn't, I gave into that fight because my PhD supervisor
714 said that nobody would understand that and as to why that will be, and what to do with this, sorry,
715 yeah.

716

717 ENRIQUE - Yeah. I also had a question for Doenja after reading the paper, so the coat rack, I
718 mean...

719

720 DOENJA - The connectivity coat rack?

721

722 ENRIQUE - I mean did that influence what you were measuring at the beginning with the routers?

723

724 DOENJA - Yeah, so it's that page for sure, but there's some fabrics on there as well, I think we had
725 a blanket that you could roll up and direct the connectivity and that kind of stuff. Yeah, so definitely
726 thinking about connectedness and degrees of connectedness, yeah.

727

728 ENRIQUE - Because at the... it's also, the router is one of the objects that I think is it's waiting for
729 a proper redesign, because if it's hidden why couldn't it be hidden in other places?

730

731 DOENJA - Yeah, it's hidden but at the same time it's so present, right, it's shaping our entire life at
732 the moment.

733

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734 ENRIQUE - Exactly. No, I was just thinking because now when you mention about the router at the
735 beginning about making... weaving the antenna of the router and make it more... and then I saw
736 the connection here, so I wonder if it was one of those threads that you keep exploring and
737 exploring.

738

739 DOENJA - Yeah, subconsciously. I only found that thread when I was going back through the
740 pictorial now, I'm like, "Hey, I did make sense".

741

742 ENRIQUE - Yeah, and it's also funny how... because I think also one of the characteristics that the
743 probe studies, the good probe studies that I read around... is that they reflect back, so maybe they
744 have the power that narratives and movies and other narrative and more fiction heavy, is that they...
745 you find elements of your life that relate to the probe studies, and I think that's a different way of
746 relating to data than in a way of proving something through the data and presenting a study that is
747 supposed to relate to your life, because it's factual. But when we do probe studies what happens is a
748 little bit different, is you get the richness of the stories, if you engage with that richness you are able
749 to distil certain kind of insight that then it goes back to your own life experience and rings a bell, so
750 to say. So it happened to me also with the mechanisms for controlling connectivity in the sense that
751 I realise I have some of those too, and kind of extra elements that I have incorporated in my every
752 day life to not make connectivity always on but... and I recognise those also in the life of some of
753 my friends. So I guess perhaps that's... yeah. But the problem is then back again, it's not
754 measurable right, it's very much... it's inspirational, but I guess that's the point, that's what
755 inspirational means too...

756

757 DOENJA - Yeah. It's interesting, I think we're all in agreeance that it's fine... that's inspirational is
758 a fine enough outcome, but then you have to go through the struggle of convincing computer
759 scientists I guess so that's enough... But yeah, it's funny, because probes have been around for so
760 long and you would think that they'd have a bit more credibility at least at this point.

761

762 ENRIQUE - No.

763

764 DOENJA - No.

765

766 ENRIQUE - Well they do, they do, but... yeah.

767

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768 DOENJA - Yeah. But yeah, what you're saying about taking your own experiences or stuff that you
769 recognise from your own life I think is definitely also a big part of yeah, probing. You need to have
770 that to... yeah.

771

772 ENRIQUE - So for my probes, or for the metaprobes thingy, the idea is how well they work, and
773 for other probes that I have used before is also how well they work. Another way of thinking
774 whether they are good or bad is, so we have mentioned engagement and we have mentioned that it's
775 not about creating quantitative ethnographies, but another one would be how well do they work as a
776 thought experiment, which that is more in the speculative tradition of thinking, but then again, what
777 is a good thought experiment?

778

779 DOENJA - Yeah, I mean I wonder just a process of creating... I mean for your papers that's
780 absolutely what it was, and then for Britta, I wonder just a process of writing the story right, that's
781 already insightful. So yeah, then I guess for our study I recognised that as well, just the making of
782 the probes already triggered some thinking into what those speculative concepts could be. So
783 maybe it's just yeah, again the commitment to... that leap of faith, the jumping into the... yeah,
784 making the probe and that's the thought experiment. But then the risk is that you... is there a way to
785 really do it wrong?

786

787 ENRIQUE - Yeah.

788

789 (22 seconds of silence)

790

791 ENRIQUE - Or perhaps it's also... so I was listening to Evgeny Morozov the other day, the
792 solutionist guy, and he has launched a service now that is called Syllabus, totally recommend that
793 so check it out, but basically he says the idea for launching this is maybe... was that there is
794 excellent content out there in terms of news, videos, multimedia, whatever, but it's just not evenly
795 distributed, that's how he said it. So he launched this service in which he has get together with a
796 bunch of people, they have these... they curate content, but they deep curate content so to say. So
797 they choose the articles based on certain precepts, of course very much on the left and very
798 postcapitalist and stuff. But what it made me think is that maybe that's another reason why we use
799 probes, because we as academics, what Britta was saying before that we question everything, there
800 is so many things to consider, we read so much so perhaps the probes is also a way to curate the
801 direction of our thinking.

802

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803 DOENJA - Yeah, I like that framing, yeah, expressing the content we've consumed through probes.

804

805 ENRIQUE - Yeah.

806

807 R - Any final comments or should I maybe wrap up for the day?

808

809 (16 seconds of silence)

810

811 R - Okay, maybe I should wrap up.

812

813 BRITTA - I think we all talked out now.

814

815 R - Yeah. But I think this was a brilliant discussion and some of my highlights here are, and some
816 food for thoughts for all of us after ending the session today, one of the things that came forward
817 with the discussion was the publications, especially pictorials as designed artefacts or curated
818 artefacts of some sort and all that invisible work that goes into them, which was basically the reason
819 why I did this study. Then also this got me thinking about... because there was this, in all your
820 papers and also in the discussion there was this focus on evaluation of probes and good probes, bad
821 probes, but also good probe reporting or bad probe reporting because this is very much determined
822 by how artefact translates into knowledge and then how it's reported and seeing publications as
823 maybe inspirational resources, and therefore what goes in there and what doesn't go in there or
824 what was the word, failure stories, or how we read the papers as well as how we write them,
825 whether are designer mode or reader mode. I think these are really interesting things. Then there
826 was these points made about participant recruitment and that was something I really wanted you to
827 bring forward and I'm so happy that you brought it, because in each of your papers it was a search
828 for many pluralistic alternatives as opposed to one normative understanding or what is real et
829 cetera, so, and there are of course challenges that come with those, and again, curation, creative
830 performance, all these brilliant insights, I'm super happy at that and I hope there are some really
831 good takeaways for all of us. Yeah, so this will be it for the time being and I'm hoping that the
832 conversation will actually continue once we share... once I share the research with the larger group
833 and then invite people to the write up process. Yeah, thank you very much and have a good week.

834

835 DOENJA - Thank so much for organising this...

836

837 BRITTA - Absolutely.

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838

839 DOENJA - ... it's a nice little COVID get together.

840

841 ENRIQUE - It was super nice thanks a lot. It went super fast for me I have to say, it flew and it was
842 great to... I felt like I was... we were thinking together, it's so nice.

843

844 DOENJA - Yeah, totally.

845

846 R - So thank you and bye, bye. Nice to meet you all.

847

848 DOENJA - Bye.

849

850 BRITTA - Bye.

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R = Researcher P = Participant

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R - ... checking now, recording, yes. So Chris, maybe would you like to start with your paper and introducing yourself?

CHRIS - Yeah, sure, sorry, I'm still a bit dark but I can't really get round that. Yeah, so I'm Chris Elsdon. I know Tom but I don't think I've met John or Susanne before, so hi, and I know Sena because I was a postdoc at Northumbria where Sena's doing her PhD, so hi Sena, really nice to see you again. So I'm a design researcher in Design Informatics at the University of Edinburgh at the moment, and, so my research broadly covers human experiences with a data-driven, life data-driven services. At the moment I'm working on a lot of stuff to do with Fintech and Blockchain and creative industries and things, but broadly my interest is in what happens when we quantify things, turn them into metrics and live our lives in a very number-driven way, and I know at least one of the other papers is quite related to that as well. So yeah, so that's me, and yeah, I'm probably mostly some way between sociology and design, I don't have a pure design background but I use design research to ask interesting sociological questions I think. So this paper is quite old. It's part of my... I did it as part of my PhD, but it was one of those fortuitous side projects. I did my PhD, well what was Culture Lab in Newcastle and then Open Lab, at the time we did this research it was Culture Lab. So this is one of those, it's a chance to work with a load of colleagues and this was one of those ideas we have, "Oh, wouldn't it be interesting if..." and we were interested in how people would express identity through data, and my PhD was about memory, so this was a little bit of an aside, and we were trying to get people to be more expressive with data and query what it means to people. I suppose some other... so I won't go too much into the findings and stuff with the paper, I'll just say a little bit about the methods. So again, this was quite... I think because it was a collaborative project it was one of things that had lots of different people's input into it, it was quite spontaneous, we were trying to do what felt like the best way to do this event, and in some ways I would say the paper, and then there's a subsequent publication more on the method of "speculative enactment", it was very much retro, like reflective afterwards. So I would say that this is work that we didn't really understand what we were doing exactly when we did it, we were just proceeding quite pragmatically of trying to make... we knew we wanted to do a real event with people, we wanted to probe other ways of expressing yourself with data. We made some good decisions, which turned out well for us in terms of we had this basis of these dating profiles, which I think in this case most resembled a probe approach, and we had a sort of practical, we were trying to make something easy and fun for people to fill in, but also giving enough guidance but not too much. In terms of data we want to give people space to do things that were a bit unconventional and not

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36 just... so you probably can't see it on the paper but even the questions we did ask people were not
37 things like "Tell us your shoe size", or, "Tell us how fast you walk", these kind of... we were trying
38 to be a bit funny about that, again though mostly in a pragmatic sense of... we focused a lot on this
39 being a successful dating event. It was a... I think that's one of the things that was interesting about
40 this work subsequently is that the data that the... the research data we got from this was very rich
41 because people were really there dating and really trying to make an impression of themselves
42 through data, and that's what makes the talk around this probe really valuable for us to analyse. So I
43 think the fact that we were focusing a lot on the pragmatics of that, and I sound a bit cheesy, but we
44 really focused on the lighting and the music and we had fizz and stuff, we put a lot of effort into
45 that side of things, which I think did make a difference in terms of the authenticity of this event and
46 therefore... and I think, I suppose with the probe it's interesting, some people took it very seriously,
47 some people less so. Maybe the other interesting thing was that we were very open to people lying.
48 People lie on dating profiles all the time obviously, but that in itself was really interesting was this
49 playing around with, "Well how do you lie with data and what does it mean? What would be
50 truthful here?" and there's a number of types of data that people talked about that you couldn't
51 really have measured. So the form of the probe was trying to elicit all those things. I guess I'll just
52 say, I can talk a lot more about it, but I guess I'll just say so there is a follow up paper. So we did
53 this work and then subsequently I did, I learnt quite a bit from this and I did another bit of
54 speculative research looking at data in a wedding context, so dating and then weddings. I've not
55 done funerals yet, but. Then we reflected on two or three pieces of work around this is what we
56 called "speculative enactments", and the main thing there was around finding ways to get people to
57 engage in speculation about technologies but to do so in quite a real and meaningful way where
58 there was something at stake for the participants. So here there was something at stake for the
59 participants buying into our speculation and actually thinking about this quite seriously as opposed
60 to maybe just... I don't know if you've had these experiences of participants, but you don't quite
61 know if they're just playing along or they're just indulging you and you're not sure really if they're
62 just trying to say the right thing, or what they think is the right thing. So that's the broader context
63 of this work, but this was the first one that we did as a group and it made us go, "Oh, that worked
64 really well, why is that?" I suppose the other thing just to mention is that I think another thing we
65 did that was really important is we... these, you maybe can't see it here, but these... the probe was
66 the invite. So it was in an envelope and we in this case, in most cases personally were able to give
67 these to people as their invite to the event, so they got it in advance, and at the time that was about
68 sensitising them to this quite weird idea that you represent yourself in data. So we had that nice...
69 so yeah, people couldn't have done this on the night, they had to have done it... really it would've
70 taken... yeah, that was really valuable that they thought about it before and they put all the effort

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71 and probably emotion into what you'd normally do thinking about a dating profile. I don't know if
72 there's anything more specifically Sena, or anyone, that you wanted me to say, but hopefully that's
73 not too much of a ramble.

74

75 R - Thank you Chris, we'll get back to many of the things that you actually started opening up. So
76 maybe we can continue with John, would you like to talk about your paper and contextualise it for
77 us and introduce yourself please?

78

79 JOHN - Yeah, absolutely. So I'm not sure if I've met anybody on the call, so just by way of an
80 introduction, I am based at UCLan in Preston, and I feel a little bit like I'm an alien in this room
81 because my background is not necessarily interaction design or human computer interaction, I'm
82 kind of journalism and media and my background is more a traditional media, journalism scholarly
83 route. Well actually for quite a while now I've always collaborated with interaction designers,
84 human computer interaction specialists, so this paper is really a smashing together of lots of
85 interests and approaches. So yeah, so that's me, I'm an associate prof at UCLan. In terms of this
86 project, there's loads of streams and influences going into the NewsThings project, so at its core it's
87 that fundamental challenge for the industry that I worked in and now that I teach and study, which
88 is how is journalism sustainable, what are the issues impacting on journalism at the moment. When
89 you start asking those questions there are a few key and core answers. One of them is how users
90 engage with news and what users and audiences think of journalists and journalism, and there's a
91 whole spectrum of challenge around that. So you'll all be aware the rise of fake news, audiences
92 disbelieving journalists, journalists actually becoming more polemic visibly, i.e. more opinion-led
93 pieces, and the consequences of that are multifaceted in that people aren't paying for journalism in
94 the way that they used to, so there these businesses are less viable, people are disbelieving
95 information, so you can start to make an argument that civil society, democratic function of
96 journalism is being eroded, and you could go down that line and it's quite a bleak picture if I'm
97 really honest. It's maybe not as potentially fun as Chris, your work around dating and data, but our
98 perspective on that is very much so what can we do, how do we tackle some of these core and
99 fundamental issues? At the time we were working on a bid around internet of things and news
100 objects, what could news objects of the future be, how could users interact with content in that
101 ubiquitous way and ambient way, what kind of data could we collect from these objects, what kind
102 of content would they serve? So myself, industry partner, who are now called Reach, they're the
103 largest regional publishing group in the UK, and then a design agency run by a guy call Thomas
104 Buchanan who was based up in Dundee for a while in terms of the product design studio there, so
105 he comes from more the interaction design background, and we said, "Well what can we do that'll

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106 be good?" and we wanted to create objects and artefacts that had yet to be imagined, it was really
107 important to us that we weren't going to piggyback on market ready technology, this was all about
108 looking to the future and thinking about the disruptive futures could be. But there's a huge gap in
109 terms of the industry and the study of journalism, which is actually really getting under the skin of
110 people and understanding people in this really multiple fundamental ways. There's swathes of
111 analytic data that you can capture really fine grained services from organisations such as Chartbeat
112 where it's all about user engagement et cetera, et cetera. But we just wanted to talk to people; we
113 just wanted to get a sense of where they saw journalism within their wider lives. We wanted to
114 understand what they talked about when they chatted to their neighbours and when they chatted to
115 their family. We didn't want to know how long they dwelt on an impression on a website, it's like
116 "We don't need that, how do you feel about these stories? What fires you up, what are you worried
117 about?" So that led us to the news things process and what we basically did is we ran... as you'll
118 see from the very short paper, we never did anything else in terms of external publication on this
119 but we did some creative consultation sessions with industry, so we worked with a news room in
120 Manchester but also their commercial teams and others, and we tried to understand from a journalist
121 and editorial perspective what these core issues were that they thought they were facing. Then we
122 did a number of exercises with audiences in Bristol and Manchester that are mentioned in the paper,
123 and we got them to do timelines of their days, we got them to overlay information, so professional
124 journalism, citizen journalism, friends, family. So we got this really rich picture of where they
125 encountered media, and that was fascinating in so many different ways, and we had the industry
126 partner in the room and they were... they had a bit of a kicking if I'm honest because a lot of people
127 didn't like them, but the insights that they could hear from their readers it was great to have those
128 conversations happening. Then we created the cultural probes that I know Sena you were leading
129 on, and we just felt that this was an amazing opportunity for audiences to talk about their lived
130 experience just like the methodology points towards, and to capture a much richer sense of news
131 consumption that they would not normally give us. One of the core findings, and one that's in that
132 paper and I've spoken about a number of times, was just this emotional resonance around
133 journalism, and actually people are angry, people get angry at journalism all the time, from the
134 moment they wake up and they start consuming media on their mobiles to the moment they go to
135 bed, and that is sometimes because they're angry at the way that the story's told, sometimes it's
136 because they're really fired up by an issue, they're angry at the world rather than the journalism.
137 Sometimes they're angry at the opinion, and it was a really positive experience for us because when
138 you went back to the news rooms and the product teams in the publisher, they never thought they
139 would sign up for people who were angry at their content, they thought they might make people
140 angry but they never factored that in. So it was a range of insights that we would never have got

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141 otherwise. The other thing that might be interesting, and I'm not sure if this group was... I mean
142 I'm obviously... this was an interdisciplinary project and our design agency had computer scientists
143 and behavioural psychologists, and one thing that they found fascinating about the probe experience
144 is how they understand that data. There were some really fundamental methodological
145 disagreements around what this information actually could be utilised for and how it should be
146 utilised, and I wasn't in the room at the time but there were stories of stand up arguments about
147 right ways and wrong ways and, "How could we possibly do this?" and I just thought that that's
148 great for me, in terms of a provocation for a research team, that's exactly what you want, but we
149 would never have had that free exchange had it not been for the probes and how they responded,
150 how they manifested the data. So yeah, so that's the context of the work. This paper ends quite
151 abruptly I think because we hadn't deployed the devices, which we did do into users' home for a
152 month. I mean I'm happy to, if this is relevant I'm happy to chat about some of the insights we got
153 from that. I'll give you the broad spectrum, some of the users of the consumer devices when I came
154 to pick them up one user wanted to buy it, they literally... I was like, "Win", but they didn't want
155 me to... "No, we want this, this is fine John, we can't change the volume but apart from that it's
156 okay". Then at the other end, one of the cone thing, the industry device that gave you a semantic
157 analysis of Facebook comments, positive, negative, the journalists should use that, they were quite
158 honest with me at the end and they said, "Look John, it was awful, it was rubbish, a minute and we
159 turned it off", and everybody laughed at it. So we had a great ream of responses as well, so it was
160 good fun from that perspective. But Sena, I hope that was useful, again, I'm a bit rambly this
161 morning but that's the project and the context.

162

163 R - Thank you. Susanne, can we continue with you?

164

165 SUSANNE - Yeah, sure. So hi, actually working as a postdoc at the TU Wien in Austria and I was
166 a predoc in the TOPIC project where we used these cultural probes. In general I'm interest... my
167 research interests are between technology and care, health in general, and my PhD was about how
168 informal caregivers can be supported in general and also through technology in their daily life, in
169 all the daily activities related to the care situation. So I was part of the TOPIC project, and for us at
170 the beginning it was clear that we will design and use cultural probes in the preface of the project,
171 because the lead of the project used cultural probes in former project and did really good experience
172 so it was clear for us that we will also use it. So the preface was that we did several interviews with
173 the informal care givers at their home, did several visits where we did participatory observations,
174 and one part of the pre-study was also our TOPIC cultural probes kit where we had several probes
175 because were suggesting that not all probes will fit to the interests and the abilities of all our users,

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176 so we gave them different ones, so they can pick what they wanted to fill in and use. In general we
177 did really good experience with the cultural probes, people really used it a lot, not all of them, not
178 all of the probes, but in general it was really good. The diary was used very good because people
179 are used to that things, used to the things and used writing diaries about their life, things like that,
180 others really don't like to write about their feelings, problems, things like that, some really put just a
181 daily plan in the diary. So yeah, were very happy about the cultural probes because it really
182 enriched our whole material and whole data of the pre-study. Yeah, and then we had... we wrote a
183 workshop paper about a workshop of a German conference, and then we had the possibility to write
184 a short paper about the cultural probes and, so we did and that's it. But at the moment I'm not
185 working in any project related to this topic where we can work with users, so I'm not working
186 further with cultural probes at the moment but yeah, let's see what he future will bring.

187

188 R - Thank you. So Tom, finally could you introduce yourself and your paper?

189

190 TOM - Sure. So I'm Tom Jenkins, I'm an assistant professor at the IT University of Copenhagen,
191 and I guess to give a sense of my background I'm actually trained more as a theorist and my
192 background is in science and technology studies and then I went to an art school where I learnt
193 more building services and thinking with things. This project about the gut-brain axis and self-
194 tracking and the role of interaction design to help self-tracking be seen as otherwise it's kind of a
195 (inaudible - audio interference) project, it's a debacle in other ways. It came from my first year at
196 this new position in Copenhagen and kind of needing a project that this entire lab could work on,
197 and in some sense there was no owner, there was no real structure to it and it was just exploratory
198 design process that then I think Chris was describing very well, a thread was pulled through to tell a
199 story about how these artefacts were produced, or how artefacts were produced that could really
200 justify the design work that we did. So when we think about this kind of idea of exploring
201 discovering access, we were lucky enough to work with a group of people from Copenhagen
202 University's medical museum, and they had on, and still have on this really excellent exhibition
203 called "Mind The Gut", and I might actually share that screen for you just because I have it up now.
204 Let me see if I can grab it. Yeah, so they had this beautiful exhibition about this relationship
205 between the brain and the gut and how these constructions of the co-influencing of the mind and the
206 gut work together. So as collaborators they were really excellent to talk to, and I think for us the
207 key was to work with the right group, as collaborators they were really excellent, because they
208 knew the topic intimately and were really invested in how to communicate around the topic but
209 weren't necessarily interested in the science of it. So it gave us... well, I mean, are interested in the
210 science of it but not necessarily that as being their expertise. So when we developed these self-

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211 tracking probes to help them reflect on their own gut health, gut-brain connection, it gave them a
212 licence to speculate with us in a way that wasn't constrained by plausibility and really became
213 something we could work with productively as a design resource. So I think that's where I'll stop
214 right now, but I'd love to maybe talk more in the future about how this work was presented through
215 multiple iterations and different submissions, which I think will be an interesting thing to talk about
216 in general.

217

218 R - Thank you. So I guess we can move on with the open discussion so if anyone wants to bring up
219 the first thing, please feel free to do so.

220

221 CHRIS - Can I just say a random thing first?

222

223 R - Yes.

224

225 CHRIS - My mum at the moment is completely obsessed with gut health and every time I speak to
226 her, literally every phone call she tells me something else about how microbio and all these things,
227 so when I read your paper Tom, I was like... I actually send her the abstract just to say... it's just so
228 random, I'm just reading this now. So sorry, that was a... I guess one thing I wondered when you
229 were speaking John, and maybe the same for you Tom, was I did something about... the probe
230 approach is often seen as a way of gathering data, so you send it out into some environment that's
231 maybe difficult to access is an ethnographic sense and then you envision yourself as the design
232 team getting something back and doing something with it. But I think what's interesting about a
233 few of these approaches is that the participants are doing things with the probes too, either they've
234 got to account for themselves in an interview to you or they're arguing with someone about what it
235 means, and I think that's really interesting to... I think in a sense you can view the probes as a lot
236 more than just a data gathering device that actually... and when you give participants... when they
237 have some stake in it in what the probes are, whether that's because they're trying to use it to
238 impress somebody or impress you, then I think that often lends another life to them or another
239 character to them, and I don't know, I, yeah, I think there's probably something in the future lives
240 of probes as well beyond their initial... they very quickly become research data and maybe there's
241 more to them. I don't know if that resonates with anyone else.

242

243 TOM - It completely does, I mean I think you actually describe it nicely in this paper, in your paper
244 about how this data becomes a ticket to talk, right, so rather being a way of... the probe itself, the
245 use of these probes, these recordings, these diary entries they made, those are interesting to some

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246 extent, but, and surely the deep briefing interviews and then these conversations that we've had
247 with these participants that actually the design idea is these conversations about how they
248 conceptualise these practices is where the interesting stuff comes from.

249

250 JOHN - Yeah, I think, I don't know, I've got a few thoughts in relation to that which is I think on
251 the NewsThings project, because we took the audience/participants through a process, there were
252 multiple engagements over a period of time, it felt like we were very much collaborating in multiple
253 ways with them. So they knew that the data within the probes themselves, whether that's their
254 actual monitoring of their experiences, putting emoji's on a timeline or taking pictures, but also the
255 opportunity to reflect on that, it was... we were giving them multiple points where they can own
256 this process for themselves, they found it kind of a learning process for themselves. But they also
257 knew I guess within the... because they knew very well the wider context of the project they knew
258 the value of it for them and for us as well. So they knew it wasn't just their anonymised data in a
259 way, it was very much they were contributing towards this R&D path, and I'm giving it too grander
260 name by calling it an R&D path, but they knew we were working towards something that had an...
261 I mean it's interesting in terms of the frame of speculative, but there is a tangibility around our
262 work as well. There's a newspaper that they get every week, we might influence them, there was...
263 so it was really fascinating. The other thing just as a quick observation, we had some people who
264 completed the probe reflection and colleagues in Bristol who led on this element were overwhelmed
265 by the level of detail that they'd got. A few participants just went, "Oh, I'll go again and again and
266 again", and obviously they were getting more out of this than we would ever realise I think because
267 of the level of activity that they'd generated. So that was really interesting as well in terms of...
268 you're right, it is the data but also there's whole other swathes of experience that they have around
269 this process.

270

271 CHRIS - I think there's really something in that, how you construct that journey for them as well,
272 and it's not just a one off, it's not just deliver the probe pack, pick it up, interview them, "See you
273 later", it's yeah, I think when probes are done really well there's a number of touch points and yeah,
274 they've got a sense of the bigger picture, and it might be that some people do choose to depart at a
275 certain moment from that process for all sorts of reasons, but also almost giving the participant
276 several chances to... because it might be that one probe doesn't quite hit them or isn't just... there
277 is a, I don't know, you need to be lucky, too, that things just land at the right moment in their
278 schedule, lives and whatever. But I think having that journey for them feels really important to do it
279 well.

280

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281 JOHN - Just thinking about that in developing it, I can't remember which paper it was in, but I
282 think there was definitely multiple references to a lack of completeness on occasions, sometimes for
283 example, a gender split of not filling in the diaries is one example, and sometimes people don't fill
284 the... It's really interesting in terms of when we designed them being really conscious of allowing
285 people not to feel that they've not completed the task if they choose not to do it, but you guys, I'm
286 wondering how much of a factor that was actually in the fine grained creation of them, it's what
287 you don't want to do is feel that... create that sensation that users are not giving their time when
288 they are expected to. It's that Polaroid example, "No, just take a picture, that's great for us", as well
289 as the opportunity to create more enhanced diary entries if applicable, I thought that was quite
290 interesting how you incorporate that flexibility without it being a negative thing was quite important
291 with the probe.

292

293 CHRIS - It comes back to how direct were you asking people. With the dating profiles we really
294 tried to make a mix of like, "If you can't be bothered here's some quick questions you can answer",
295 and then there's a lot more space for you to take this a lot more seriously as well, or if you want to
296 just... we tried to yeah, we... I think the other thing we did, we did fill in our own ones too, and I
297 know that sounds really... it's good to taste your own food so that you're not giving people
298 impossible things to do. But that itself especially in that context was like, "Can I actually answer
299 these questions? What would I put?" was helpful in just fine tuning that level of detail, and not
300 trying to... as I say, we were really trying to get people to think about... we were really I guess
301 being critical of the way that quantified self-data is mostly presented in what it's assuming to do, so
302 we were just trying to get that balance of giving people enough rope but not leading them too much.
303 I think that's a tricky thing to get as well, especially if you are looking for, I don't know, maybe this
304 is more relevant for you Susanne, but if you're looking for specific things about routine there are
305 some requirements. We were very open ended, we weren't trying to design a new dating app, so we
306 could be very open ended, but maybe there's other context where actually if there are more specific
307 requirements you have to be more specific, but I guess it would vary in different projects.

308

309 SUSANNE - So for us with our target group the informal caregivers, this is really a special group
310 because most of the time they have no time for other things. So, with designing the cultural probes
311 it was really important for us that they are flexible in filling in the cultural probes, so they can do it
312 once a day all the stuff, or do it in small parts separated throughout the day because if we had forced
313 them to do it once as... so that they should take one hour, sit down and do all the stuff, this
314 wouldn't work for all of the users because care situations are everywhere different. So I think was

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315 really an important point for us so that they really would fill in the cultural probes and it will work
316 for them.

317

318 CHRIS - What was the overall motivation for them being in the research, how did you recruit them
319 or were they already part of a group of people who were contributing to this, or?

320

321 SUSANNE - It was really hard to find people being involved, because yeah, they are so stressed in
322 their situation normal time. I think people took part because they were interested in the project and
323 they wanted to give the experience so that future informal caregivers can benefit from that.

324

325 CHRIS - Do you think that... to what extent do you think people were, and I know this is just
326 different personalities, but sometimes I've had experiences of participants where I think we've
327 really given them a chance to express themselves that they don't often get, and I could imagine with
328 that group you're talking about rather there's an element of just having somebody to listen to what
329 their day's like, but?

330

331 SUSANNE - Yeah, but this was also a motivation. I think it was not the first motivation to take
332 part, but they really enjoyed it, to be honoured because they have so much experience to tell us and
333 they really like it that we came to their home, we talked to them, they had people they could see and
334 talk to. Most of the time they just see their care recipients and nobody else, so this was really
335 enjoyable for them and we spent a lot of time at their homes because it was so hard to end the visit.
336 One interesting part was the cultural probes was... that it was a very, as you talk, a very reflective
337 one also for the users because they filled in the actimoClock about how their day is structured, how
338 the emotions are related to these activities and many users told us that they now realised how much
339 care work that they do, how frustrated they are, and on the other hand some people told us that they
340 were not aware that their social surrounding is so big, because they all of a sudden, "I just knew
341 some people", things like that, yeah. So it was also on one point it was positive, this reflection, on
342 the other hand it was also very negative for them.

343

344 JOHN - Susanne, do you think that they expected to... those who did have quite negative
345 reflections or insights, do you think that they would've expected that at the beginning of the
346 process? The reason why I ask is I think there's some really powerful ethical questions around
347 probes in terms of that potential depth that you might go into and when we leave our packs with
348 them, we then say goodbye and they have contact email addresses for us all et cetera, but they're
349 left alone to go through this process and I've always been struck by some of the ethical issues that

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350 they prompt. I'm just wondering yeah, do you think that your users expected to have some of those
351 more negatives that were revealed and did you think about this broadly ethically as well and if so,
352 what were your thoughts around that?

353

354 SUSANNE - To be honest not really, it was not really necessary for our project to have an ethical
355 committee to approve it. We as researchers and I think also not the users expected that they have
356 such negative reflection, and it was really odd talking to the people and having this negative
357 reflection and I wasn't sure what I should answer and say and that's always hard.

358

359 JOHN - Yeah, it's challenging, really challenging.

360

361 CHRIS - There is something about the unpredictability of things though isn't it, if you're in an
362 interview with somebody you can be quite clear about what you're going to ask and you can say,
363 "Oh, we're going to talk about... maybe someone's passed away", or "We're going to talk about
364 money", you can identify this is a sensitive topic and obviously you're there with them and you can
365 say, "Hey, stop at any time", or whatever. But the probes is... even though it's invitational and, so
366 you would hope people would just not... if something was too difficult you'd hope that they would
367 step away. I suppose it's... I don't know, I've not come across this, but if this was... I mean I guess
368 the dating profiles would've created a degree of anxiety for people too, that was part of the value of
369 them as well, if there was nothing to say they wouldn't have been very valuable. But I think it's
370 harder to anticipate as you say, the depth or people themselves might come... because they're so
371 deliberately exploratory they could reveal things that you wouldn't necessarily get at, or with an
372 interview you would very quickly manoeuvre around a difficult ethical subject in a way that with
373 probes maybe you're not there or no-one's there. Yeah, it's a tricky one.

374

375 SUSANNE - Yeah, on the one hand cultural probes are really cool, because people can fill them in
376 without any person watching them, so I think they gave much more information, much deeper
377 information. On the other hand yes, if they... if we then asked about some stuff they wrote in the
378 diary or activity card or which Polaroid they took, it was really not always that easy also for them to
379 talk about them. I just... I once asked an informal caregiver, "So what about the children? Do they
380 help in the care situation?" and that's the moment when she began to cry, because it's not that easy
381 with her children because they have no contact anymore and yeah, really hard, really hard, yeah.
382 But on the other side if you look from a researcher side, it's really good to get all these data,
383 because many of the users when we picked up the cultural probe kits told us, "I think that's not

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384 really interesting stuff for you that I wrote in diary”, and I was like, “Oh, no, it’s so interesting, you
385 have no idea”.

386

387 TOM - Chris, would you describe this method you used as a cultural probe?

388

389 CHRIS - You know what, it’s funny actually, I just put my eyes over the paper again last night and
390 yeah, we said, “The dating profile was akin to a cultural probe as it engaged participants prior to the
391 event. However, it was also the key artefact in the event”. So yes and no, it definitely wasn’t...
392 okay, so I think we were definitely drawing on that method. I think we realised... but it was also
393 again pragmatic and okay, we knew we wanted to have these dating profiles and we knew we want
394 people to use them at the event, and then I think we went, “Oh, well cultural probe...” we also
395 knew that we wanted to sensitise people... I remember having a conversation where we thought,
396 “People can’t just come in and do this, people are going to need time to get their head around the
397 idea and think about what they’d put down”, and then we realised, “Oh, actually that’s cultural
398 probes isn’t it?” So it wasn’t like we started the project saying, “We want to do a cultural probes
399 thing”, but we realised what we were doing was implicitly quite similar. I also, yeah within... in the
400 follow on paper on speculative enactments, we’ve used the same approach and I would view it in a
401 similar way. I mean I guess to me it’s like, going back to the thing I said at the start of you take the
402 cultural probe and then you start doing stuff with it in the real world, so it’s got this... it’s not just
403 this data collection device but it becomes something else that now matters to people. Yeah, I
404 think... without being too bothered about definitions or what is (overspeaking) but I think I yeah, I
405 would feel comfortable saying that’s what it is. Yeah, it was... yeah, I think it is more so than
406 anything else I’ve done, because actually when Sena was asking me which paper and that’s why I
407 chose this one, because I thought it was more evident, whereas the speculative enactment paper is
408 much more about how do people think about the future and how do we do that with people, of
409 which probes is a small part, whereas this to me is much more we gave people a probe and then we
410 got them to do things with it in an event. So yeah, I would, but is it... why do you ask, do you think
411 that...

412

413 TOM - No, so I was thinking that I was... I would say that we explicitly didn’t do cultural probes,
414 and I was curious with the difference between probes and cultural probes and how there’s the sort
415 of merging of these ideas. So in some sense you’re inspired by this idea of probing, but we were in
416 no way looking to do this broad spectrum... we wanted people to reflect on their expertise as
417 experts in a way that was sort of structured, and it was not meant to be this, “Here’s a set of a
418 activities that lets you reflect on various parts of your life”, or not, it just engages what you’re

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419 thinking about. So I think there's something that maybe in some ways we drew more on technology
420 probes or other styles of HCI research towards a topic that might be more cultural if that makes
421 sense. But I think there's something about how probes in design research inevitably points to
422 cultural probes and why I was curious that... I just briefly checked all the citations, we all cited it,
423 it's where we come from, it's this idea of... this questioning style comes from, but there's the
424 question of "Is it always the same format?" I mean maybe there's something new and different
425 about having a kind of probe like activity that then becomes the basis for that, I mean I think that's
426 actually quite reasonable I have to say.

427

428 CHRIS - I think also there's something like... as you were talking there I was thinking part of the
429 reason why I feel comfortable this is a... even though this wasn't... we weren't necessarily
430 enquiring as to an environment, we weren't saying, "We want to understand..." in the way that
431 Susanne's project very much, and yours too John, was very much, "We want to understand your
432 daily routines and experiences with this thing", but actually we... I think there's something about
433 the diversity of what we were asking, whereas maybe I suppose when you get more towards
434 research products or technology probes they tend to be slightly more focused around, "We want to
435 think of this technology or this set of data or this interaction" or set of interactions as opposed to...
436 Maybe it's, I don't know, maybe, I don't know, where does that map on to a design probe? I
437 suppose your project was still very early on about, "What on earth would people do with this kind
438 of data?" but it feels like yeah, it feels like there's... maybe, you weren't maybe so interested in the
439 broader space in which it was happening, I don't know.

440

441 TOM - Yeah, I think you're right, I mean I think there's something about the open-endedness and
442 the, I don't know, contextlessness if that makes sense. I mean it's obviously not right, because the
443 cultural probe is all about context. But I think that's something that's distinct and meaningfully
444 interesting about the distinction between... if we look back to the "Presence Project" of course, they
445 send the probes into multiple conditions and look back and this completely different context of data
446 comes from. But I think there's something really nice about then taking the people to think through
447 their data with... and I'm thinking again of a metadating event where that does seem like something
448 that is methodologically distinct and actually in some ways maybe richer because you can then have
449 both the... I mean actually it's also interesting because you're not interviewing them, they're
450 having these conversations with each other.

451

452 CHRIS - Yeah, well we... something else I'd forgotten, it's weird how you forget your own work,
453 but something else I'd forgotten was that when we got... the first thing we did was we split the

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454 room in half and we gave them the other half's dating profile, and the idea of this was you would
455 normally see someone's profile before you met them, so we didn't want them just to meet and have
456 the profiles. But in practice what we were really doing, and the conversations we really had were
457 was like, "How did other people do this probe activity?" and you quickly realised some people did
458 this really seriously, some people tracked real data and put it on, some people made it up, and yeah,
459 exactly as you say, for them to be having that conversation and then to be interviewing each other
460 about it. We subsequently did some time later, and partly because we wanted to supplement some
461 of the research data we had, we interviewed some people later on about the whole process. But
462 yeah, I'd forgotten we did that, and actually I think it was really nice just for participants to go,
463 "Well you gave me this weird thing and I spent a bit of time filling it in but I don't know what
464 anyone..." it's like that thing you know, you're in class and it's like, "What have you put for that
465 one?" it was that kind of... and I think there's something quite interesting in... I suppose they
466 were...

467

468 TOM – The instruments.

469

470 CHRIS - Yeah, but they were, I don't know, they were themselves unpicking what they were doing,
471 do you know what I mean, they were...

472

473 TOM - Totally, yeah, they had to interpret the instrument... and also understand what... there's this
474 always... this question, "What are they actually after?" and I think we elicited a couple of times,
475 "What do people really want to know?" and this moment of sharing notes, like, "Oh, god, did I do it
476 wrong?" it's a brilliant moment...

477

478 CHRIS - Also as well... the other funny thing here was, is the person who you were... somebody's
479 profile was in the next table or the next room, so it was like, "It's one of you guys that says you've
480 walked this many steps", and that was weird... I don't know, it worked in the context of the event,
481 but there was something also about the fact it wasn't just me and you talking about what we each
482 did, it's me and you talking about someone else who did the same activity did and then comparing
483 that to what we did, do you see what I mean? So I think there's probably a whole bunch of things
484 you could play with there.

485

486 JOHN - I think, I mean I think that's fascinating for loads of reasons because Chris, the other frame
487 of this as well is the... because we thought a lot about continual prototyping of probes, probes as
488 prototypes, prototypes as probes all the way through this, it's always iterary (iterative or itinerary?),

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489 always development, it's always responsive. With the dating example you're adding all other social
490 layers, so you're asking them to do the probe-like exercise, data... but then some people will have
491 made that up, some people will have gone into detail, and then you have that normative
492 conversation, "Oh, what did you do? What was the right thing to do?" Well actually you're asking
493 them to do dating, and some people in that room will really like the character trait of making this
494 up. It's the kind of loveable rogue perhaps, it's, "Yeah, I don't want to do any of this, I'm just going
495 to make it up", whereas the other extreme is, "Oh, no, I spent ages going through this and I wanted
496 it to be perfect", and some people will be really attracted to that character trait, and it's not being
497 attracted to the data, it's being attracted to the character and the personality that spoke about the
498 data and it's that projection of identity. I really loved that notion that was in that paper around,
499 "Yeah, we're just going to project an identity that we want to have, that aspirational thing", and
500 giving, it's (a) giving them that opportunity, and (b) understanding what that means when they do it
501 in that way, and that's the richness that I think all of us at one point mention in all of our papers, the
502 richness that these deeply qualitative and interpretative methodologies give the research process.
503 But yeah, I thought you were wrapping things around and around and around the actual event.

504

505 CHRIS - Yeah, I think... as I say, I don't think we, I honestly, I'd love to sit here and say, "Yes,
506 isn't that very clever that we did that", I don't... we were mostly just trying to make this thing, this
507 quite weird idea work and we were obviously drawing on things we knew before, and then I think
508 on the way made a series of quite good decisions. But yeah, definitely now... I don't know, for me
509 that event really crystallised, always question why are participants there, what do they think they're
510 doing, because you think it's a research interview but for them it could be a bunch of other things,
511 for them it could be getting something off their chest, for them it could be contributing to science,
512 and really do you have... and then that event really exposed that what people say is so contingent,
513 it's obviously, but so contingent on the circumstances in which you put them and the control you
514 have as a researcher to do that, whether you get them to do it in their home or in a workshop or in a
515 café or all these sort of things. I mean that's a general point, but I think especially with probe
516 research you have this opportunity to twist that in various really interesting ways, but then it does...
517 yeah, as you say, it's this interpretive thing I think. You're not... probes are not... yeah, they're
518 there to be interpreted explicitly in a way that other research approaches maybe are much more
519 about having a descriptive... getting a descriptive understanding of, if you did a survey you'd get a
520 descriptive understanding of how much people engage, or you're (inaudible), that describes how
521 people engage with news, it doesn't really give you a lot to interpret. Whereas probes from the get
522 go are probably quite crap at describing a lot of things but they do give you this interpretation, and

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523 this seems like primary purpose for me more than just... I mean I know they do give you these
524 other facets of things too, but, yeah.

525

526 TOM - I mean they're nice because you can't really be wrong.

527

528 CHRIS - Yeah. For you Tom, how important... I'm just thinking about the role of people being
529 experts in things, like everyone in our event were single and...

530

531 TOM - Yeah, mixed experience on dating.

532

533 CHRIS - Yeah, they have mixed experience of dating. Obviously the caregiving, you're an expert
534 on your own experience in that way, but yeah, I just wonder as well would these things work if
535 people weren't... and how... especially the gut... could you have given it to my mum for example,
536 now she is now an expert because she's all over it, but?

537

538 TOM - Yeah, so I think what I was alluding to earlier was an earlier version of this paper that didn't
539 result in design outcomes, but instead was trying to do a methodological contribution, and that had
540 a whole study we couldn't include in this paper about using these probes ourselves,
541 autobiographical self-tracking. I think that the story there was that because this is an emerging
542 science, because nobody really knows these relationships, having a lived experience, a
543 phenomenological probe of your own experiences coupled to... people are knowledgeable about a
544 topic having their own experiential components grafted on to that gives a unique way of exploring a
545 topic that is not yet settled. So it gives this multifaceted perspective on something that you can
546 possibly feel directly but also needs some sort of mediation to understand what it is you might be
547 thinking about, and that was I think really interesting but not necessarily compelling to reviewers,
548 which I totally get, right. "Oh, so you were saying some designers used it and then they asked some
549 experts to use it and then they learned about the topic, fair enough, that's easier to write, you did a
550 good job, nice job." But I think there's something about this inevitability of having to use your own
551 experience as a fundamental way in to a topic that has this emerging nature or is about the sensation
552 of living in a body, and I'm a little sad to leave that out but at the same time, it wasn't part of the
553 critical path that led to any kind of materiality. So something I'd be curious about in your work,
554 everyone's work, is what parts of the project get left out in the probe studies, what isn't described or
555 what doesn't contribute to the research reporting even as inevitably part of the research process?

556

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557 JOHN - That's a really good question, Tom, and my instincts is that we could all talk about this for
558 quite some time. One thing... it's interesting because I'm actually working on a much longer write
559 up of the NewsThings project for a different output and I'm getting a chance to actually reflect at
560 length and in depth about this experience that we had a few years ago. One thing that doesn't...
561 would never have made it into the outputs at the time in any way, shape or form was the element
562 that I referred to earlier which was the... I mean it's kind of what you said, it's that internal team
563 element, but it was the internal team tension around the creation of these probes particularly for that
564 interdisciplinary element is for our subject specialists, they were weathered to this, and in fact this
565 was not a prescribed methodological approach, they wanted to do probes before this project really
566 crystallised, that was an aspiration, this is what they wanted to do and it fitted, it's fine.
567 Behavioural scientists had huge professional issues with some of the propositions around this. For
568 me, it's that journalism innovation academic bridging industry partner, there was some kudos here,
569 which was this is not known at all within the industry. When I talk about cultural probes, whether
570 that's through organisational managers or the industry more generally represented, it's just, this is
571 not on their radar, so this was an exotic thing that had an asset in and of itself when you spoke about
572 the work, "We're doing cultural probes", "What are they?" "Well let me tell you about them".
573 There was this kind of positive element. But then when we started to get the data back and we
574 started to the base our ideation around that data, and some of the concepts that we came up with
575 were really provocative for the industry partner, but we always boiled it back to what the probe data
576 pointed towards, it was always based on what we'd found and what we'd discovered that it added
577 another layer of tension that the probe catalysed even though itself didn't manifest. So it was
578 actually within a research and innovation team the tensions that this activity provoked in lots of
579 different areas. That tension can be great, I'm not rendering that in a negative facet, but it was... not
580 just the probe and how we interpret it being a provocation, all the way from the use, the design, the
581 deployment, the analysis, it created those tensions all the way through. So that's something that we
582 didn't... there's no auto-ethnography in here, but that's something that was really powerful, I felt.

583

584 CHRIS - Just to pick up on, there's something I think that... do you think that... I'm sometimes...
585 I've been on projects where certain examples or certain user or certain scenarios or certain quotes
586 from participants just keep getting dug up and you get to a point of it and you think, "Are we
587 hanging on this a bit too much?" but I actually... I wonder whether cultural probes do have a
588 longevity that other forms of... you have a scenario or a storyboard or something that you've come
589 up with fairly early on and you come to it and then it becomes canonical and the design process that
590 you're on and it becomes quite hard to let go of it. I just wonder whether cultural probes have a bit
591 more, not quite kudos, but there's something... it's something as you were speaking I was just

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592 thinking it feels like it would be easier for you to go back to, “Yeah, but this is an experience for
593 my participants through the probe than it would be for me to just give you a quote”, you see what I
594 mean? I wonder if probes have got... because of their materiality and their open-endedness and that
595 they can be constantly reinterpreted that that’s more powerful than going back to, “Yeah, but 67%
596 of people said this”, do you know what I mean, there’s something about that.

597

598 SUSANNE - So we... okay.

599

600 TOM - (overspeaking)

601

602 SUSANNE - We created out of the cultural probes and also the interviews and the participatory
603 observations, personas and also scenarios and that was really a helpful tool to communicate with the
604 industrial partners throughout the project to always say, “Look, this is a persona, this really reflect
605 our user group, we should think of them and help them”, things like that. So we don’t talk with the
606 industrial partners about the cultural probes, but the personas and the scenarios, user stories.

607

608 CHRIS - Do you think they would’ve... what was the... how do you think they would’ve reacted to
609 the raw cultural probes data? How would that have played out?

610

611 SUSANNE - To be honest, the industrial partners were not really, I would say, happy about doing
612 the user story, so it’s really to work with the users from the beginning, do a pre-study, things like
613 that, they were not really convinced that this is really a useful thing. So if we would start with the
614 cultural probe thing they would like, “Okay, no, not really interested”. So I think that it was more
615 useful to have personas so that they can imagine our user group and think, “Okay, could this be
616 useful in this case, in this scenario?” things like that.

617

618 JOHN - I mean I think that’s fascinating Susanne because for me the... because when you were to
619 deploy methods such as cultural probes or other (inaudible - background noise) you’re working
620 really closely with people and then the risk of the abstraction of the persona, the kind of, “This is a
621 representation of a potential person”, it’s really interesting because almost... I see where you’re
622 going and I think I’ve had experience of this as well; industry partners are more comfortable with
623 this fictionalised persona. But when you give them hard data of people taking pictures and telling
624 you how they feel, “We don’t... we’re not sure about that thank you”. The only other thing that I’d
625 add just as a personal reflection is in the exit interviews we ran with the industry partner, they
626 didn’t really get into depth around the probe, in fine grain around the methodological approach and

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627 design, but what they did say a number of times was how much they valued working with different
628 methodologies because of their potential to embrace new learning. So it was almost, “Don’t give us
629 the hard work and the stuff we don’t understand, but we’re not doing this at all anywhere else and it
630 gives us opportunity to learn a new way”. So they kind of processed it in that positive way, having
631 not wanted to worry about the close reading of it.

632

633 CHRIS - Again, I think the thing that’s in my head just with all of these is just like yeah, what’s the
634 life of the probe, is it just yeah, is it whether it continues to be used by participants, whether it
635 continues to have this currency in research projects, whether you turn it into another set of
636 resources that then you base things on like this... yeah. Maybe this is your project Sena, but it does
637 feel like there’s a whole set of different biographies of what these probes can do, and sometimes I
638 guess, yeah, sometimes those are quite unpredictable and they just happen, but yeah, it seems really
639 interesting.

640

641 TOM - I think there’s something... I’m also reflecting on where... I teach probes as a method in my
642 interaction design class and I’m thinking about not teaching it as a method, because it’s so
643 deceptively simple and incredibly hard to do and requires such thought and (inaudible) and also
644 can’t easily work in the two or three weeks we really have to do a probe study. But it just doesn’t...
645 there’s really no possibility of it working, I mean I have frequently students develop a probes kit
646 that becomes a workshop and I think that’s actually a very reasonable translation right, where it
647 becomes design games instead of a probe. But I’m also thinking I’m not sure I’ve ever had a
648 cultural probe succeed. I’ve done a number of attempts, I’ve had a number of materials that I’ve
649 made and I’ve had a number of things that haven’t gotten much data back, or when I have done it, it
650 ends up not being as part of the critical path. I mean I spent maybe three or four months of my PhD
651 working on probes and it never became part of anything, they just were a failure, they just were not
652 on the critical path, not in the document at all, just off to the side. So there’s something that I think
653 is really hard about probes that isn’t really discussed certainly in the literature, isn’t really discussed
654 certainly in the examples because what we see published are successful probes, and I think there are
655 some things about the insane complexity of doing it well and doing it right that needs to be, I don’t
656 know, not publicised but just richly considered.

657

658 JOHN - There’s something really important there about what metrics... so what is a successful
659 probe, and almost asking that because actually if you... if one, not necessarily yourself, but
660 almost... it’s just such a basic point, but the thinking that you would’ve gone through in order to
661 create those probes that were never deployed, there’s value over here somewhere and maybe

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662 impossible to articulate it. But it's interesting because we had a lot of drop off with the probes as
663 well, it was... because they are hard no matter how easy... they demand that level of engagement
664 and we became quite comfortable with that quite quickly, because actually within the context of our
665 project it was genuinely normal and useful. What interestingly the debates around is this the right or
666 wrong way to do it, we never got beyond those, so there was never consensus really. So yeah, it is
667 interesting how... I guess it's the right tool for the right context at the right time in the right space,
668 maybe you find that with your students as well, it's fleetingly these opportunities really arise that
669 they are genuinely of use perhaps.

670

671 TOM - It requires a community that you know enough to tune the device to or tune the probes for,
672 but also not well enough that probes could lead to interesting information in some sense, and that's
673 a very awkward middle ground.

674

675 CHRIS - I do think there's something in the back though... it's easy to overwork the probes as a
676 purely qualitative research tool as opposed to being inherently design research and yeah, just as
677 John's saying, I'm sure there were things that you figured out by doing even unsuccessful probes,
678 and the same with metadating profile, probably some of the most interesting conversations we had
679 was, "What goes on this profile? What do we ask people? How do we ask that? Could people
680 collect that data? What's the kind of data they can collect? Does that matter?" We had a lot of those
681 conversations just in trying to make this thing, which in itself actually is not an especially... the
682 graphic design of it is nothing special; it's much more about the content of it. But those
683 conversations were... yeah, and it's probably at that early stage of the project when you're really
684 excited about what's going to happen here. But yeah, I think even if that had not really worked,
685 especially for me because my broader research interest was about what does data remotely say
686 about us, what does it really mean, how do we... in a sense I was having those conversations
687 internally by doing this thing in a typical research through design fashion. So I suppose it's like
688 yeah, what are you comparing it against and what... as you're saying, there's such a big opportunity
689 cost or there's such a... I suppose it's yeah, maybe it's how... maybe the question is how can you
690 situate probes within a whole design process, basic process so that even if they're not directly
691 successful in data gathering, they have other values as you say. I mean you were saying John,
692 there's always this... probes and prototypes are the same thing going on, so maybe if they'd failed
693 as probes, they would then work as prototypes or something, I wonder if there's ways of maybe not
694 having them out on a limb but as part of something else.

695

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696 TOM - Yeah, I was going to mention that, maybe a prototype being probing as being quite similar
697 which is super... and that is tight wrapping to keep together, a nice tight coupling to keep together.
698 But I think... I mean I can reflect, now five years later on how my probes failed, and it's because I
699 was asking for too much, I was asking for things too particular. I had some toolkits around building
700 speculative sensors for shared living situations, and first of all that's too detailed, second of all it
701 requires too much baseline knowledge, and third of all it's like yeah, you end up getting things
702 where it's like dirty roommate alarms, yeah, cool, this is not super interesting, we've all been there.
703 So I wasn't oblique, I think would be my reflection, I wasn't open-ended in the way that would
704 require to make these kinds of interesting insights. It was more about this idea of me asking direct
705 questions in a naïve way, "What would you like if you had sensors in the home?" and that's just not
706 actually a sensible probe, that's not a probe, it's a workshop activity. So it ended up working okay
707 in a workshop, but it was of course a terrible probe, because people just looked at it and were like,
708 "This is a lot of work to understand even what it is you're thinking about to get into the problem".

709

710 CHRIS - I was going to say something else...

711

712 TOM - But I do think... sorry.

713

714 CHRIS - No, no (overspeaking) what I was going to say, never mind, just carry on.

715

716 TOM - I was going to say, I think producing these activities, producing this kind of very obvious,
717 "Can you do my thesis for me?" questions, really helpful for me to think through what kinds of
718 things I was interested in and what kind of things I was not interested in, so that was actually quite
719 nice as a filter mechanism.

720

721 CHRIS - I was going to maybe change the subject slightly, but I'm also curious, and maybe this is
722 mostly for you John, but probes, it's all very physical and in a sense rudimentary and even to the
723 extent to which people use instant cameras and Polaroids, but does... I'm curious about how do you
724 do... what do online probes look like? I've done a little bit of things before where I've had people
725 WhatsApp, I've used WhatsApp as the medium to which people send me pictures of stuff and
726 that's... I know there's experience sampling methods that are like that, but I guess especially in the
727 news context, obviously the project was very much about things and the physical nature of that, but
728 I wonder if... I don't know that I can really recall many good examples of probes that are natively
729 digital rather than physical and I wonder why that is, I wonder why that's hard to do or if anyone's
730 done it well, know of a good example.

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731

732 JOHN - Well the... I mean we purely went for analogue experiences for the cultural probe specific
733 element because of multiple reasons really in that... I mean you guys will know more than me, but
734 the physicality of this materiality was really important, and the idea that we would give them those
735 disposable cameras... interestingly one user didn't know how to use the disposable camera, because
736 they'd only ever used a mobile phone and they got in touch and said, "What is this?" So yeah, no,
737 we were... we didn't go down a digital route because we wanted to make it an analogue as... so it
738 was independent of the digital innovation that we were trying to do. For example, one of the
739 exercises was very much seeking to get a sense of editorial content and what the emotions are for
740 that, so the exercise, we gave them a £2 coin and we got them to go to the newsagent, they flipped
741 the coin they... if it was heads they bought a newspaper they would normally buy, if it was tails
742 they bought a different newspaper, they then read it, they then reflected, they then chose a
743 newspaper and spoke to a stranger, reflect it. So it was actually an experience, a place, a thing. One
744 of the reasons... we did have a very early discussion about maybe doing something on a mobile,
745 and one point was made by one of the team to say, "But they consume news on their mobile in that
746 digital thing and we want to create new objects, are we going to just present stuff that almost
747 defeats some of the object in a way?" I do know that a colleague has tried to create mobile probes
748 from a product to do with the museum in Wales with users and try to create... I think in the end he
749 went analogue as well. So I'm not aware of it, but again, this is not my fundamental area, but we
750 definitely stayed away from... in terms of the activities and the provocations we went analogue, and
751 then our physical artefacts that we put in place they were digital content, but they were the object of
752 the project...

753

754 CHRIS - Yeah. There's definitely something about defamiliarising even if you're designing a
755 digital thing, the analogue helps defamiliarise it and get to some more basic questions that you can
756 then work up again into a digital thing. Yeah, it's just curious to me that... especially say if you
757 were working with teenagers for example, who are so digitally native that I wonder how it would
758 be, yeah, just a curiosity.

759

760 TOM - I have some masters students working on a thesis right now using Snapchat to report probe
761 style questions, but this is not the most... I mean they, basically they get prompts and the SMS and
762 then respond to it via Snapchat.

763

764 CHRIS - Yeah, because it seems like there could be lots of really nice, I don't know, it seems like
765 there could be lots of really nice (inaudible) or prompts to doing things digitally that you wouldn't

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766 maybe otherwise... but then again maybe the value of cultural probes is the space, that you just
767 leave someone for two weeks and they eventually get bored enough to fill them in. Yeah, I don't
768 know, maybe it's... there's something nice about you're not presently saying, "Hey, tell me what
769 you're doing right now or tell me..."

770

771 TOM - Yeah, I mean I think there's something... the things I look back to from these original probe
772 kits or maybe early probe kits that I find most evocative are the glass for listening if something's
773 happening the apartment or things like these telephone jotting pads that have a sided use that we use
774 casually based on what your every day life is like, which I think is very different from how we think
775 about the research methods, it's kind of haphazard, not an intentional... but also not directed.

776

777 JOHN - Did anybody get the sense that any of the participants were providing information that they
778 felt the researcher wanted? I mean it's a standard challenge, isn't it, when you engage with
779 participants, are they telling you what they think or experience or are they telling you a version of
780 that that they think that you might want to hear for a degree of utility? We had a real... there were a
781 couple of times for me slightly on the periphery where I felt they are... they have an idea of what
782 we're working on and they feel that they want to give useful information rather than feeling that,
783 "We don't want that, we just want you to tell us what you're doing, what you're thinking, what
784 you're feeling". I'm just wondering if anybody else had that sense whether in the projects that
785 we've looked at the papers or Tom, just because you've mentioned a couple of times your students
786 are doing this kind of stuff as well whether they've mentioned things like this? I'm just really
787 curious whether that's something that...

788

789 TOM - Yeah, so I've seen it happen often with student work but it's the same kind of way that other
790 research methods fail, which is to say, "I really like what you're doing", it's over-niceness, over...
791 students recruiting friends thing, "This is really great", it's not that it becomes this is just not
792 interesting, it's not that it's a problem with the researchers, there's not really interesting things you
793 can derive from it.

794

795 SUSANNE - I didn't have the feeling with my type of group that they just fill in information that
796 we wanted to hear because I think they had not really an idea what the prototype or the product will
797 be at the end, so they couldn't... they didn't have the possibility to write it in that way because they
798 had no idea, but could be, yeah.

799

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800 CHRIS - I wondered... but that's a really interesting point, so if you keep probes so that it has to
801 have this openness and this obliqueness and yeah, if you're asking too directly for a thing then you
802 do run the risk more of people sometimes second guess, "What are they really wanting me to do
803 here?" and then it (a) becomes more difficult or... yeah. Whereas if it's much more... if it's more
804 oblique or more even just... I don't know. Some of the best probes are just there's a silliness to
805 them that helps the participants let go of any, I don't know, baggage or they can also play with you
806 a bit, do you know what I mean, and then you can unpack that together, "Well what did you mean
807 by that?" in a way that's not just a direct fishing exercise, "Well I want to know these specific
808 things about your life please". Yeah, I think that... the openness of the whole project feels really...
809 I suppose to be able to know that whatever you say is going to be interesting to the researchers is
810 probably a good place to the participant as opposed to saying, "Your job is to tell me these things I
811 want to hear".

812

813 TOM - Yeah, thinking... of course that's how the dissertation probes I spoke about were not
814 successful, and also again maybe in this project around self-tracking, why we made something that
815 was a self-tracking tool, it's not going to be something that's oblique, it's not going to be something
816 that's indirect, it just... "Any experiences you have with this thing that is the thing we're interested
817 in are the kinds of experiences we're interesting in talking about with you, especially if you can
818 reflect on your own contextual and expertise to your own situated knowledge", that way we're
819 accurate. In some sense it was nice because there's no way to tell us something that wouldn't be
820 useful or what needed, whether or not you think you know what we want, that's sort of irrelevant at
821 that point.

822

823 JOHN - I think just listening to you there, all of there, I think that makes me want to ask Sena a
824 question, which is are you going to ask us to create cultural... complete cultural probes around your
825 research into cultural probes, and are we... yeah, is there anything... I mean you've just allowed us
826 to talk, which I'm sure is exactly what you wanted to do, but I'm just conscious there's ten minutes
827 left or so, is there anything that we would talk about for you Sena in terms of what would be useful
828 for you as the researcher, active researcher in this dynamic?

829

830 R - I think... no, I'm not going ask you to make probes for me, you have already done it and what
831 I'm interested in is how you report it, the stuff you talked today was very much about all these
832 tensions between design and research and what goes on the background when communicating the
833 value of probes to participants or the failure stories or to stakeholders, all of these things that
834 actually never make it to the papers. So I was really interested in those and trying to understand

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835 why these things happen and what can we in the long run do something about overcoming these or
836 maybe, I don't know, creating some form of probe or design culture in general. So that was what I
837 was interested in and you actually covered most of the prompt questions I had for each of you.

838

839 CHRIS - I was going to say something to that earlier though, which was that I think probes, there is
840 an intimacy to probes that makes them sometimes difficult to publish as a raw form in the way that
841 interviews and interview data is... even quite sensitive quotes, it's different from a picture of
842 someone's living room in a way, it's somehow less revealing, I don't know. So it's easier... and
843 obviously there's a whole set of issues around publication formats and just not having room for
844 enough pictures and all that sort of stuff, but I think more than that yeah... so with metadating
845 obviously it would've been nice if we would've made all of the dating profiles... yeah, I think the
846 ones we published we had specific permission to do that more so than... well, we went to them and
847 it was clear we were doing that. Yeah, in a way that I definitely wouldn't... even though in my head
848 I'm like, "Oh, it would be amazing to be able to look through..." I would love to just scan through...
849 because exactly, these are all these questions about, "How should I frame this question? Do people
850 understand this diagram?" there's all these really pragmatic things would be super useful to have an
851 anonymised probe database to go and fish through or a set of supplementary materials or dah, dah,
852 dah, just as there's a whole set of websites of amazing data, physicalisation or vis techniques or
853 whatever. But there is some... I would personally feel... I'd have to be really clear with the
854 participants about what that was, and it does feel very... and it maybe breaks the intimacy of,
855 "Right, this is a conversation between you and the design team, and not a conversation between you
856 and the rest of the world" I don't know, it's kind of... yeah, it does feel more intimate in some ways
857 than other types of data sometimes.

858

859 TOM - Something like that where... I was thinking and reflecting that basically it might be the only
860 paper I've seen I can think of offhand where you see a lot of probe results as probe results. The
861 other thing that I think I see a lot at least in maybe more ACM or more HCI conferences is that
862 probes are mentioned as part of the technique, but they're not necessarily part of the material, the
863 presentation, they get kind of alighted, because the story of how the probe is both produced and
864 then generates knowledge and then leads to insights is one that sounds and looks like magic I think.
865 If they're part of a design process they don't get expressed often. It's similar to maybe how
866 workbooks are often left out, because there's an interstitial, intermediary forms that don't seem to
867 have the same logical progression that you can write about in textual formats. I appreciate that
868 pictorials are moving towards bringing in these other kind of intermediate forms, but there's

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869 something that's really missing is this, in this methodological contribution as material development
870 of ideas rather than theoretical ideas.

871

872 JOHN - I think that's really interesting and I've been doing a lot of thinking again as an alien in the
873 room about HCI, what's the focus of the majority of the papers, and it's about the object and the
874 interactions with it and yes, there is methodological, kind of, illumination but it's ultimately about
875 users and things and interactions perhaps. I think that understanding the innovation journeys and
876 innovation processes, it's not understood, and I've been doing a lot of work around not just
877 networks but the agencies of people within those networks and how they influence these innovation
878 processes. So for us on NewsThings, you can take it from our ends users and the designers and the
879 objects to people like me who are leading the project to my university's intellectual property
880 department who signed this off early on because I couldn't have done any of it had I not had them
881 signing off. Equally our ethics committee, I had to articulate what these things could be in order for
882 them to begin to happen, and I couldn't deviate from that too far despite what the users might tell
883 me. I think there's a really complex picture. I think the other thing from my side is I think the probe
884 data and how it's represented, there's a real challenge there as well, because even though Chris, I
885 agree that it'd be interesting to come back and see it in a slightly different... it has a slightly
886 different heritage, but it also exists in a very specific time in a very specific place with very specific
887 people within the context of a project and the research questions and the resource. So it's how do
888 you best illuminate that, and I ended up doing the thing that I think Chris, you mentioned this I
889 think, I just show the picture, I don't just show the quote, I just show the one picture that is the back
890 end of a postcard but was part of the probe that has emoji's plastered everywhere and writing all
891 over it, somebody just went to town on this exercise and that's my picture that I show of the cultural
892 probe to be able to articulate what this is. So I think it's a fascinating issue, I have no solutions, I
893 just think it's interesting.

894

895 CHRIS - But I think there's something key in what you're saying which is that the question is how
896 valuable is this... this knowledge is so specific and contextual that it's... particularly in terms of
897 articulating in a research paper where the contribution tends to be intermediary and more
898 generalised forms of knowledge, so like in an HCI paper, the contributions of metadating sure, the
899 method did end up becoming a contribution in a separate paper, the contributions of it are really
900 about "Here's talk about data", and that's the generalisable, more intermediary contribution. I think
901 that's... the thing that's difficult is even though individually as designers and people doing these
902 activities we want to... you probably would learn from looking at a whole set of examples on these

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903 things, on their own they're so contextual that it's hard to, it's very hard for them to be understood
904 as a research contribution in the traditional format.

905

906 TOM - Yeah, but I would say this is something that we could... that's something I'd actually be
907 very interested in trying to ship some ideas around, because certainly if we look to other disciplines
908 like the arts or history, it comes from examples, it comes from collections of things that can lead to
909 systematic knowledge around how one approaches problems, I think that could be really exciting,
910 it's just a question of where does one put it and how does one get credit for it, and that's really
911 impossible I think right now.

912

913 CHRIS - It's also what's the limit to that, with metadating as I said, the articulation I gave you here
914 was, well here's the situation which we were... I mean I think it's addressed somewhat by people
915 putting in more reflective commentaries of, "We are a set of researchers from this time and place
916 with this background and that's flavouring how we do this research", I think that's a good thing
917 generally. But I suppose it's how much... yeah, there's things in all these projects where you go,
918 "Oh, that's a nice little bit of learning that I could take and do something else with", but there's
919 some things which are just about, "Who were you? Where were you? What were you doing?" and
920 those things I don't know that other people necessarily learn that much from that, and that's the
921 balance, whenever you're writing these contexts you're writing the set up for your paper and it's
922 like six pages long or whatever and you're like, "I need to cut this out and get to stuff", and I think
923 that's the thing isn't it, I think that's the challenge.

924

925 TOM - No, I don't mean the particulars of the situation, I mean the reflexivity of the production of
926 the materials to engage with the situation. I mean yeah, I guess we're talking about the same thing
927 in different angles.

928

929 R - Susanne needs to leave and I guess you all have other things to do, but I think that was a very
930 important point that we eventually got to about the... because you all talk about in your papers
931 about how you're trying to use probes to understand the wider experience and situate your
932 contextual enquiry into a whole wider thing. It sounds like what's missing in our reporting on
933 probes is that we're not doing it when reporting on how we use probes as part of the larger research
934 context as more reflexive ways of reporting. So I think that was great and yeah, I think that was
935 about it. So thank you for really taking the time to read each other's papers and come join today.
936 Yeah, we'll be in touch. I'll share the videos as soon as I can and I guess the whole conversation
937 will then continue when we share the videos and then engage in the writing up process.

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938
939 TOM - No problem.
940
941 CHRIS - Thanks for the opportunity Sena, and really nice to meet you all.
942
943 TOM - Thank you so much, yeah.
944
945 R - Yeah, nice to meet you all.
946
947 TOM - Thank you too.
948
949 JOHN - Yeah, good to meet you, take care.
950
951 CHRIS - Take care, thanks, bye.
952
953 R - Bye, bye.
954
955 TOM - Bye.
956
957 R - Have a good week.
958
959 TOM - You too.

B.7 Guidance on how to conduct a similar study

One of the contributions of this thesis lies in the format of the second study apart from its content. There are not many examples of research by design researchers with design researchers as research participants. As I've discussed in my thesis, it's more common practice to inquiry into a topic using design-led approaches to research. Hence, design research rarely involves design researchers as research participants to focus on their lived experiences of design research and the contemporary issues of the field. For some design researchers who work in emotionally charged settings or spend a lot of time in the field with their participants, life and research could mingle a lot. These experiences offer very valuable insights into conducting research with care and has the potential to change how we understand research, as I've discussed in section 5.5.3. However, they are rarely articulated, mainly to conform to the scientific ideals of the researcher as a detached, neutral observer. These experiences are not discussed as much as they should, also because such studies are considered to be theoretical studies into design that happen mostly in isolation from practical studies. To put simply, it is not part of the expectations from a practice-based design research.

This research attempts to build connections between the theory and the practice of design, but also amongst design researchers. I involved design researchers in my studies, because my own experience alone may not have been enough to support my arguments. Moreover, I wanted to show that despite the diversity of their journeys into 'becoming a design researcher' and the richness to their identities, they have been impacted from the ongoing issues I've discussed throughout this thesis in different ways. The field of HCI and interaction design research, as well as the broader design academia, could benefit from similar studies, where the researchers are given the opportunity to discuss the contemporary issues in their field. This kind of discussions normally take place at conference workshops, such as those at CHI or DIS, and more recently at roundtables, again at the conferences. However, these tend to be on a specific topic of inquiry rather than the general issues of the field that impact all and even the future of design research. While these issues may also be discussed as part of the challenges to conducting research on the topic, they are likely to remain topic-specific.

Additionally, these discussions tend to happen behind closed doors. One often has to submit a position paper and go through selection criteria to be a part of these discussions. The workshop outcomes may be presented as afterwards; however, mostly upon a process of editing to transform them into formal research outputs. Even where the outputs of the workshops may be made available afterwards in one way or another, the conversation mostly remains inaccessible for the rest. I believe that a researcher-in-the-making like myself

could especially benefit from these honest conversations before they are presented formally. In fact, these conversations are likely to be more beneficial for them than they are for more experienced design researchers. I cannot emphasise enough how the first interview study with the design researchers changed the way I thought about Probes, design research, and my own research to lead to the second interview study of this unconventional format. Before calling for more studies like this one, I would like to provide some practical considerations on how to make it happen.

1. **Don't be intimidated:** This would be considered 'elite interviews' in social research. Elite interviews are where researchers interview participants that are experts on the topic and/or powerful figures. It can be especially intimidating if you are inviting some 'big names' or opposing views in your field. There's hidden labour to doing so as a very junior researcher and being ready to manage difficult situations if they are to emerge – one that's not only yours, but also your supervisors' hidden labour, as they are the ones to support and guide you throughout the process.
2. **Ask for help:** Based on the first one, make sure to ask for help from your supervisors, your colleagues, and your network if needed. They can also help you establish contact with people they already know.
3. **Provide information:** When inviting people to participate in your research, you need to provide details on the format and duration of the study, how the data will be managed, as well as why you're inviting them. This is quite common practice in ethical research guidelines. However, for this kind of study, you may need to be more specific to individuals where you can. For example, in each of the initial invitation e-mails, I address each design researcher by their name, included the specific reason why I chose to invite them, the reason why I chose the specific publication I chose, and potential insights they could bring into the conversation. This lets them know that you've done your homework; that you're familiar with them and their work and not inviting them for the wrong reasons. It also prompts them to think about how they could potentially contribute to your research. As a result, they may even suggest further work or contacts that could be relevant to your research. Remember that these people are experienced researchers who have many contacts in several institutions and could provide really useful information to you even before taking part in your study.
4. **Minimise e-mail exchanges:** Look for ways to become more efficient and concise in your e-mail exchanges (or whatever communication method you choose). Remember that your e-mail will be only one amongst the many in your potential participants' inbox. Use the subject topic text efficiently.

5. **Use online tools:** Online tools can be helpful in minimising communication exchanges. When organising the groups, I made use of Doodle, asking researchers to write their name on the list visible to anyone clicking on the link if they wanted to take part and then mark their availability on an hourly grid for two-week period. I needed to plan the groups over a two-week period in advance of a month, because a shorter span would have made it quite tricky to find matching times for my potential participants across the world, while a longer span would have resulted in an impractical use of the hourly grid on Doodle. I also used Dropbox to share their publications with each other, as well as the video recordings. Most researchers use their online Outlook calendar, it is helpful for marking your event on their calendar.
6. **Act quickly:** These people are busy people. Organising a joint meeting with several busy academics can be extremely difficult if you don't plan ahead. Make sure to book them as soon as you have enough participants for a group before their availability is gone. You can minimise the exchanges once again by sending them a calendar invite straight away rather than an e-mail, and you can still attach text and documents if you need to.
7. **Call to action:** Be clear and straightforward when you need them to do something for you and make sure it doesn't get lost in your e-mail and courtesy. Repeat it at the end of your e-mail if you need to.
8. **Have deadlines:** People tend to postpone non-urgent tasks, even though they may be quick, and may potentially forget about them. If you need them to do something that is not urgent, give them a clear deadline. In some cases, you can even rephrase your e-mail to minimise the e-mail exchanges. For example, I wanted to share each video recording with the corresponding group to make sure that they were comfortable with them before sharing all videos with the rest of the participants. Instead of giving them a deadline to confirm this, I asked them to let me know if they needed to make any changes by a deadline and that I'd proceed as planned otherwise.
9. **Check in:** It's likely that you'll organise and schedule the groups ahead. If your groups do not need your participants to do something in advance (e.g., reading each other's publications, sharing discussion points and excerpts from other publications if they prefer), you may be fine without checking in with them until the online interviews. However, if that's not the case, you may want to check in with them to ensure they are preparing for what you have asked them to do.
10. **Moderate your anxiety:** It is your own research and you probably want to get some answers to your questions. When talking to experts, you need to be able to manage your anxiety and should not steer the conversation beyond moderating. You need to be able to take a step back and let them do the talking. That way, they can move beyond the

typical role of passive research participants and become collaborative producers of knowledge. If you have already prompted them to think about their potential contribution to your research in your invitation e-mails, you are likely not to need prompts throughout the conversation. However, there's value in preparing a set of prompts and questions if you also want to get some specific answers.

11. **Embrace the silence:** Give your participants enough time to think and formulate their thoughts in the flow of the conversation. They may be also waiting for making sure that everyone has a chance to contribute to the conversation before bringing up a different topic of conversation. Having the natural flow of conversation in CRG2 for the first time, especially after CRG1 participants self-organising themselves in taking turns in conversation, there was an instance in CRG2 where I slightly panicked upon participants' silence and used a prompt. It turned out okay in the end, but it is very important to embrace these moments of awkward silence.
12. **Acknowledge their labour:** It takes a lot of mental and intellectual labour to take part in such a study. You're not only asking them to read extra material and spare time for your study; you're asking them to explicitly discuss things that could potentially impact their career in front of a group of people that they may not be familiar with. It's an uncomfortable situation for anyone for sure, yet they also know that it will contribute to your research and be made public eventually. Reward their contributions by checking in with them throughout the process, sharing your study outcomes, respecting their needs and preferences during the study and in the writing of your thesis, inviting them to co-author a publication, and continue to show your respect and appreciation in your exchanges following the study.
13. **Do justice:** When writing up your analysis of the study and selecting quotes, make sure to provide enough details on the quotes and their specific context for yourself and your supervisors, with proper notation to easily refer back to the transcripts if needed. This makes the following editing process much more easier, but also does more justice to your participants' quotes and intentions to take part in your study and reasons to commit to design research.

Appendix C: CHI 2021 Paper

How Design Researchers Interpret Probes

Understanding the Critical Intentions of a Designerly Approach to Research

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ABSTRACT

Since entering the HCI lexicon in the 1990s, Probes have been interpreted and used in divergent ways as a designerly approach to research. While originally positioned as a critique of dominant user-research methods, literature on Probes rarely reflects on such critical dimensions nor explicitly articulates the intents of using Probes as research artifacts. We conducted interviews with 12 design researchers who have worked with Probes within diverse Research through Design projects, exploring direct accounts of how and why Probes are used in practice. Our interviews brought to the fore the critical concerns behind Probe practices in relation to the language of Probing, relationships with participants, and motivations to challenge normative practices. While the pluralistic interpretations of Probes offered by our participants brings challenges, we discuss how making visible the critical motivations of our research opens up new ways of practicing and disseminating Probes.

CCS CONCEPTS

• Human-centered computing; • Interaction design; • Interaction design process and methods;

KEYWORDS

Probes, Research through Design, Cultural Probes, design methods

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1 INTRODUCTION

Probes have become a ubiquitous neologism for design-led approaches to research within the field of HCI. Originally coined as Cultural Probes by Bill Gaver and colleagues in the 1990s, the approach and its language has been interpreted widely since. In their highly influential Interactions magazine article (which as of January 2021 had been cited 2591 times, according to Google Scholar), Gaver

et al. reported on how they were inspired by Situationist art techniques in their creation of Cultural Probes as part of a cross-cultural project named “The Presence Project” [31]. They explained their use of “packages of maps, postcards, and other materials [...] designed to provoke inspirational responses from the elderly people in diverse communities” [31, p.22]. These were used as “part of a strategy of pursuing experimental design in a responsive way” [31, p.22], where experimental referred to the exploratory, open-ended aspects of design-oriented HCI research. They saw Probes as embodying the artist-designers’ playful, subjective and subversive approach to conducting user research, yet also avoided providing explicit articulations of why and how their Cultural Probes do this [33]. Even in the more detailed publications that provide more context for “The Presence Project” [32], the originators of Probes omitted framing them as a formal methodology. Perhaps as a result of being left open to interpretation, the approach has been widely adopted and resulted in a plethora of derivations. These include: Technology Probes [46], Empathy Probes [65], Informational Probes [20], Mobile Probes [44], Urban Probes [71], Value Probes [91], Design Probes [67], Broken Probes [47], Medium Probes [23], Evaluation Probes [63], Design Fiction Probes [79], Memory Probes [89], Meta-physical Probes [27] among many, many more. While each of these interpretations of Cultural Probes contribute to how we may conceptually understand the approach, Probes lack a definition or an agreed procedure [69] and in the literature might be framed as a collection of designed artifacts, an approach, a technique, a method, methodology, or a meta-method that supports other research methods [38]. Prior work on the *how and why of Probing* provides an entry point for beginners based on the commonalities in the preceding practices and suggests that Probes are typically used in the early phases of the design process (usually referred as the ‘fuzzy front end of design’) where the questions and the design directions are explored [62, 66–69, 78]. While some individual papers reporting on their use of Probes argue that the Probes can also be useful for latter stages of the design process [41], their focus remains rather on the instrumentalized use of Probes for design outcomes as part of design-led approaches to research than elaborating on how they came to be designed and used as a research tool.

In this paper, we agree that it is important to emphasize the designed nature of Probes and that the ambiguity around what they are serves to generate more open-ended interpretations of them [69]. For that reason, Probes are “not a specific method, but rather a family of approaches that are inspired by and named after the Cultural Probes” [68, p.67], as the plurality of the derivations insinuate. However, the ambiguity around the reporting on Probes as a research tool also serves to make implicit important aspects of their use as part of design-led research practices (something

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that livari argues is a concern more broadly with the reporting on design-led research practices in HCI [48]). Sharing how Probes are conceptually framed in individual projects is, we suggest, particularly important within the multi-epistemologies of HCI in order to understand how Probes are used to generate knowledge as part of the research frameworks they're used, as well as what needs to be articulated in their dissemination.

In this paper, we recover some of the prior conceptual and methodological discussions surrounding Probes and locate them in contemporary design-led research in HCI with the intention to push practice in new directions as opposed to locking it down into an off-the-shelf method. We first set out a brief historiography of Probes, discussing the multitude of interpretations that exist on the approach since the original work on Cultural Probes published by Gaver and collaborators [31]. We note how the critical and subversive qualities of Probes are often lost in published work, which is further problematized by a lack of detailed reflexive and reflective accounts of Probe practices in line with [48]. After this, we report on a qualitative study conducted with 12 HCI design researchers where we set out to explore with them why and how they used Probes in their Research through Design (RtD) processes. The interviews draw out explicit and implied critical intentions of our interviewees' Probe practices, where they brought forth concerns around how 'methods' are disseminated and built upon in HCI, how methods influence relationships with research participants, and how they set to use Probes to challenge normative practices in terms of digital technology design.

In discussing our findings, we reflect on how returning to the origins of Probes as a critique of method and practice in HCI highlights the importance of pluralistic and situated interpretations, adoptions and adaptations of the approach. We argue with this must come a greater commitment to the sharing of experiential and often unarticulated aspects of the situated practices of Probing, from which we might develop more nuanced shared understandings of the approach that still accounts for a plurality of epistemic perspectives. In doing this, our goal is not to provide guidance on how to use Probes or bring an absolute and unified definition to what a Probe is. Instead, we contribute new ways of thinking about, working with and disseminating Probes as part of HCI's ongoing interpretation of such situated, practice-based design-led methods.

2 PROBES, METHOD, CRITIQUE

When Gaver et al. [31] introduced their particular understanding of Probes, they set out not to provide specific instructions for a new method but rather to introduce an approach to HCI research "from the traditions of artist-designers rather than the more typical science- and engineering-based approaches" [31, p.24]. In doing so, they positioned Probes "as an alternative to more traditional forms of user research" [32, p.22]. Although their initial motivations behind creating Cultural Probes were somewhat due to having limited resources to conduct more traditional user studies in the context of their enquiry, they were also skeptical about the 'impersonal' aspects of these traditional methods [32]. They believed that the 'controlled' approach to studying users in context through traditional user research methods was limiting the emergence of new possibilities for technology design [32]; in other words, design's concern with *what could be* [81]. They also criticized the "constrained

roles" attributed to researchers and participants in the processes that use theory-based methods, and aimed to find a middle ground between what they dichotomized as "researchers as experts" that diagnose and treat "users as patients" and "researchers as servants" in more participatory methods [32, pp.22-23]. They criticized what they considered opposing approaches for bracketing the researcher by fitting them into a set of rules in their striving for 'objectivity', and expressed a desire to "reveal ourselves in the process" [32, p.23]. In contrast, with their prioritization of design inspiration over comprehensive data for user research, they believed the Probes "should be seen as embodying an attitude towards research" that emphasized subjectivity, playfulness, experimentation, and even risk [32, p.24]. In that regard, Cultural Probes had an underlying subversive goal, a critique of the then-traditional approaches to research that led to their creation and introduction.

In the following sections we unpack this concern for critique and subversion in relation to Probes in more detail. First, we discuss the ways in which Probes are often reported on in HCI literature in ways that disconnect them from their epistemological roots, which has led them to be adopted in ways that are counter to its critical intents. Second, we highlight how this is in part a result of a lack of reflexive accounts of how Probes are used in practice by design researcher-practitioners, meaning the critical intents of Probes practices are rarely articulated in published work.

2.1 Probes as a Critique of Method in HCI (and How this is Often Forgotten)

More than two decades after their introduction to the HCI discourse Probes have been adopted and interpreted in a wide-range of ways. As a result, it is argued that they have become "something of an umbrella term in HCI under which a wide selection of objects have been ascribed and where design has become somewhat out of focus" [92, p.3442]. In their work that recognized the rapid adoption of Probes in HCI during the early 21st century, Boehner et al. [10] argued that the original Cultural Probes share a similar misfortune with other dialogic approaches such as participatory design (PD) or ethnography within HCI: being adopted as instrumentalized applications to inform design-oriented research processes, with a disregard for the underlying epistemological commitments of these imported interpretive approaches. They argued that framing Probes as a 'technique' "suggests that they are a means by which data about everyday life might be extracted for the purpose of design, albeit without the conscious interpretive presence of an ethnographic investigator" [10, p.1083]. Graham et al. described Probes as "an amalgam of existing social science methods" that arguably "mark a turn to the personal in HCI and indicate a need for methods that reflect the individual's everyday life in design responses, the need to get beyond the antiseptic general" [38, p.35]. As per the title of their paper, Graham et al. focused on "how Probes work" from a pragmatic perspective [38] rather than how they are understood within the field as an interpretive approach [10]. In being instrumentalized as a technique or an amalgamation in this way, Probes were seen to be misapplied as a form of "discount ethnography" [25, p.548] to substitute deeper qualitative inquiry.

Boehner et al. [10] identified a source of this problem as "a deeper lack of clarity in HCI about the distinctions between positivist and

hermeneutic frameworks”; which also account for the diminution of the political activist agenda of participatory design to a “means of engagement between designers and groups whom CHI traditionally positions as ‘users’”, and “ethnography’s inherently analytic stance” to simple “data gathering” [10, p.1083]. Boehner et al. also argued that the problem somewhat originates from HCI’s lack of critical reflection on the “amalgamation of research methods into an interdisciplinary context: a disengagement between methods and their underlying methodology” [10, p.1083]. Similarly, Graham et al. noted HCI’s habit of borrowing and adopting methods; however, they also questioned the novelty of Probes as to whether they are “some form of ‘departure’” or “simply old methods (and even methodologies) repackaged and to an audience hungry to consume the next trend” [38, p.35].

Ghassan & Blythe argued that although the sense of legitimacy in HCI research is dictated by the science-based positivist camps, the appropriation and reinvention of counter-hegemonic creative approaches such as Probes enable an ongoing flux in HCI research practices, as opposed to rigid, dichotomous frameworks [35]. Indeed, throughout the three ‘waves’ of HCI [9], the debate around the role of design within the field has expanded from design’s initial inclusion as “instrumentalized problem-solving” [72, p.2083] processes with a focus on “engineering usability” until the early 1990s [94, p.1] to discussions around the framing of design-led knowledge [3, 34, 43, 70, 96]. More recent explorations on the role of design within the field include critical reflections on the notion of research contribution in HCI, by research conducted through non-deterministic design practices [1, 7, 22]. Such work not only challenges the mainstream understanding of design in HCI as problem-solving, but also the underlying “solutionist” paradigm [77] that manifests itself in the traditional HCI research scenarios that employ the plot of “overcoming the monster” [8].

In regards to the distinction of creative and methodological engineering design and the hegemonic understandings of design as the latter within the field, it has been argued that “[m]aking room for perspectives from ‘outside’ of engineering can (and has) allowed the HCI community to ask better questions about technology and society and to take up our designerly practices towards a more diverse range of critical positions” [22, p.1]. Such counter-hegemonic design practices provide a critique of these hegemonic understandings of design as ‘problem-solving’ by making explicit the critical and subjective intentions to design as ‘problem-finding’ [26]. As such, with their objective to “subvert or undermine, rather than supplement, traditional HCI methods” [10, p.1080], Probes are part of these counter-hegemonic practices (and, possibly, the most well-known). However, within this shift to problem-finding than problem-solving [64], these critical intentions behind using Probes as part of design-led research are often not reported in papers, possibly because of the post-rationalization of the ‘design problem’ and the decision-making processes involved in disseminating design-led research in retrospect. Similarly, the messiness of situated practice-based research requires different approaches to research ‘dissemination practices’ [16] than the predominantly positivist ways of HCI; therefore the validity of Probes as part of design-led research in HCI heavily depends on the explicit articulations of these critical issues implicit to design practice in relation to the science-based research

frameworks of HCI. Or put simply, being clear about what they intend to critique, why and how.

2.2 Reflexivity and Explicit Accounts Of Probe Practice

Herbert Simon’s conceptual framework for design [81, p.111] revealed that critique is inherent to design practice in its intention to “chang[e] existing situations into preferred ones”. However, his framing of design as rational problem-solving and striving for a “science of design” as such [81, p.111] dismissed the design practitioner’s subjective judgment and the contingencies in decision-making. As a result, his framework is often presented in contrast to Schön’s [80] view of “reflective practice” that emphasize the professional expertise and intuition in the decision-making processes in design practice [45].

Despite the growing interest in re-evaluating ‘design judgment’ as “a full and equal partner in any intellectual pursuit in design, on par with rational decision making” [70, p.157], Simon’s rational problem-solving framework for design tends to still dominate [24]. Consequently, the inherent critique in design in its devising “courses of action aimed at changing existing situations into preferred ones” [81, p.111] is rarely explored in regards to “Who determines the ‘courses of action’ and whose ‘preferred situations’ are we to design?” [45, p.40].

Critique is a directed practice, always in relation to something. In that regard, “critique as an attitude and a direction” implies there could be several different attitudes and directions to it; but it also implies that critique cannot be framed as part of rational problem-solving, dismissing the subjective judgment of the practitioner [52, p.215]. This is why Schön [80] offers a more realistic framing of design and practice-based knowing as requiring constant reflexivity by the practitioner. However, in order to obtain validity as a research discipline, this reflexivity needs to happen beyond self-monitoring [6] (i.e., transference and sustainment of design know how through practice-based training) to entail a critique of design [88], like that of Dunne & Raby’s *Critical Design* in articulating what is being critiqued about the hegemonic practices of design or that of Daniela Rosner in their “critical fabulations” [77].

Understanding critique as inherent to design practice, and reflexivity as core to articulating and making explicit critique, helps us understand the importance of reflexivity in the context of creating and disseminating Probes. Indeed, Wallace et al. refer to reflexivity as “keeping design at the heart of Probes” [92, p.3442]. However, Boehner et al. observed that the dissemination of Probes often lack this level of reflexivity; deep reporting of how they have been used in practice, explicit articulations of how they generate knowledge as research artifacts in relation to what constitutes knowledge, rigor and validity in design-led research [10]. The need for explicit reflection on how to address the challenges around designing Probes was also noted [61]. This echoes Göransdotter and Redström argument around design research more generally, where they note it often lacks critical and explicit accounts of design methods and processes:

“Although such accounts sometimes include aspects of design practice and how designers work, much of what practicing designers care about themselves is left aside in these stories, such as constellations

of design teams, how certain ways of working came about, how they evolved, how methods formed, or what the design processes looked like” [37, p.20].

As a result, they argue, design methods can “appear as if they lack history, as if they are somehow independent of context and exist outside the temporality that otherwise is so important for understanding what people do, their values, and ideas” [37, p.20]. Given that Probes are, typically, custom-designed artifacts and that conducting Probes studies is also a designed process [66], Probes entail “critical methodological pluralism” that require explicit reflections on how Probes as a concept are understood, how the specific interpretation relates to the original one and its implications and epistemological commitments [63, p.86]. There are a small number of exceptions to the inarticulation of the critical aspects of Probes however. For instance, Wallace et al.’s [92] reporting on reflective accounts of the creation of the craft-based Design Probes across a multitude of projects make explicit their specific interpretation of Probes and what constitutes knowledge through their Probing practice. However, despite this and increasing abundance of divergent interpretations and uses of Probes in HCI literature, the discourse around Probes still lacks both examples where their conceptual framings are made explicit and examples of situated, experiential accounts of using Probes in practice.

3 RESEARCH DESIGN

Our study was partly motivated by the prevailing literature on Probes within and outside of HCI outlined above, but also by the different experiences of making, utilizing and interpreting Probes we (the authors) have had in previous projects. Two authors of this paper, Sena and John, were familiar with Probes prior to moving into the field of HCI due to their training as designers (in Turkey and Sweden for Sena, and the UK for John), although their experiences of making and working with Probes in practice has been limited before then. Marta trained as a psychologist and became familiar with and used Probes in her research after moving into the field during her PhD. Despite our familiarity with the original work on Probes, and in the case of Sena and John design-led research practices in general, we have each felt it difficult at times to understand the reasonings behind specific uses and materializations of Probes in published literature. We found Probes to be quite mysterious things, not being entirely sure how to make them ourselves, or whether what we had made in the past and called Probes were really Probes at all. However, we started to recognize through conversations with peers locally and at conferences more pluralistic understandings of the approach than often get reported. As such, we were personally motivated to explore the reasonings behind specific uses and materializations of Probes that go unreported in papers. This, along with engaging with the prior work, encouraged us to study this to understand such pluralism and mitigate potential gatekeeping of design research know-how.

We thus designed our study to explore the ways in which HCI design researchers understand Probes and to identify common motivations, intentions and interpretations across diverse Probe practices. We were interested in teasing out explicit articulations of the critical positionings and perspectives those that made and used Probes in their research have on their work. As such, we wished to

develop with design researchers reflexive accounts of their work, to share stories of their work which would often not go reported in the publications and other public forms of dissemination that surround their work. In the following we outline the research design in more detail, discussing our participant recruitment approach, what backgrounds our participants came from, and how data was collected and analyzed.

3.1 Participant Recruitment

In order to explore and understand the narratives and motivations of design researchers who utilize Probes in their projects, we set out to recruit researchers who have used Probes in reference to Gaver et al.’s ‘Cultural Probes’ [31]. Our reasoning for this was partly because of the significance of this original work, the varieties in how it has been understood and expanded on by others, and to provide some common reference point for participants to refer to in interviews. Our planning for recruitment commenced with a search of HCI and design research publications over the last decade which had cited the original Gaver et al. paper [31] and had then reported on the use of ‘Probes’ within their research over the last decade. We focused on papers that reported on the use of Probes in their projects (i.e., not conceptual papers) and were reported on over the last decade. The latter was, in part, a practical consideration. In the interviews we wished participants to show us some of their materials and documentation of Probes and projects, we assumed more recent work would be more readily available for them to refer to. We also wished to understand what design researchers working within the field of HCI have made of Probes since Boehner et al. [10] highlighted multiple challenges around how Probes are adopted and reported on in HCI literature.

From this, we generated a list of 25 potential participants, whom we contacted each individually via e-mail to invite them to participate in the research and to explain the nature of the research. In some cases, having completed interviews, participants would recommend peers for us to further interview. The above process resulted in the recruitment of 12 design researchers that have used Probes in a broad range of contexts and practices. It’s important to note that while this led to a rich and diverse set of project examples, our recruitment strategy led to a self-selecting group of participants, which could be considered a limitation of the work. This meant despite their relative diversity of projects, in the main they held on to the values of ambiguity, subversion, materiality and design as an alternate way of inquiring. We discuss the profile of participants further in the following section.

3.2 Overview of Participants

Although some interviewees did not identify themselves as designers (e.g. P1, P4, P6, P9), they all identified themselves as working in design teams and as ‘design researchers’ in one form or another, aligned broadly with Research-through-Design [29] as an approach. Most of our participants were based in the European continent and had conducted the majority of their education and professional career within European organizations and institutions. Only one came from non-European background (P1); however, they were still located in the UK at the time of the interview. Some of the projects referred to took place outside European contexts (e.g. P1, P5, P9,

P12). However, they were still funded by councils and bodies within Europe. Despite this, the participants represented great diversity in the types of contexts and situations they had used Probes in. This included, for example, domestic practices (P2, P7, P8), refugee camps (P1), critical heritage (P5, P10), digital jewelry (P3), urban interactions (P6), pedagogy (P11), international development (P9), and data practices (P4, P12). While many of these project contexts were cross-cultural, only some of the interviewees highlighted that in relation to their Probes (P1, P2, P5, P9, P12). All our interviewees were at postgraduate level or above, and all of the Probes they talked about took place either as part of PhD studies (P1, P3, P4, P8, P10, P11) or longer-term collaborative research projects involving multiple stakeholders (P2, P5, P6, P7, P9, P12). While most of the interviewees used Probes in participatory ways, only 4 of them explicitly highlighted their participatory design approach in the interviews (P1, P9, P10, P11).

As we will note in the Findings, the ways in which participants first learned about and came into contact with Probes highly influenced how they interpreted and practiced Probing in their own work. Those that had a design background were more likely to have worked with a Probe ‘master’ (P2, P3, P7, P8, P9), who is a more experienced design researcher who had used and published on Probes and similar methods extensively in their own work. Many of these participants had adopted many of qualities and sensitivities of their master’s own approach to Probes. On the other hand, those coming from other disciplinary backgrounds (P1, P4, P5, P6, P9, P12) mostly learned about Probes from published literature, and were able to bring in their disciplinary strengths to their Probe interpretations. See Table 1 (in the following page) for an overview of why and how Probes were used in our interviewees’ projects.

3.3 Data Collection

All of the participants were invited to take part in in-depth semi-structured interviews. The interviews were conducted either in-person (P1, P2, P3, P5, P9, P10) or via Skype (P4, P6, P7, P8, P11, P12). Interviews were intended to last approximately an hour, and were organized around a broad set of prompts and topics, each of which scaffolded a discussion between the interviewer and participant about the nature of their practice and the role of Probes and Probing within it. Participants were first asked about their background as a researcher and how they defined Probes. From here the conversation moved onto more specific and reflective questions around their particular use of Probes in a specific project in depth. These questions included: what the project context was; why they chose to use Probes for that particular project; what, how and why design decisions around Probes were made; how the Probes were introduced to participants; and how outcomes were interpreted and influenced future work. Throughout interviews participants were asked to refer to specific instances of Probe use in projects, which often involved the researcher being shown material examples and documentation.

3.4 Data Analysis

All of the interviews were audio-recorded and transcribed verbatim. The transcripts were used as the basis for thematic analysis [13]. Following Braun and Clarke, this involved close reading of transcripts, initial open coding of the data that summarized sentences

and statements from participants both semantically and latently, and the sharing of these codes between the research team. Codes were then gathered into initial themes cohering around recurring issues across interviews, which were again evaluated and iterated by the three researchers. These were finalized into five themes, which are presented in the following sections.

4 FINDINGS

Our analysis led to the construction of the following themes around the critical intentions and concerns around Probes: Probes as fuzzy, strange, yet legitimizing; Probes as amplifications of practice and material questions; Probes as manifestations of care for others; Probes as subverting and facilitating small politics.

4.1 Probes as Fuzzy, Strange, Yet Legitimizing

It was clear from the outset that our interviewees brought with them a multitude of interpretations of Probes, often seeing it as a “fuzzy” (P11) term lacking clarity and definition. There were multiple instances where the term Probe was interwoven with other terms participants used to express their work, such as “creative kits” (P9), “creative packages” (P10), “mediation tools” (P11), “dialogical tools” (P1), and “object questions” (P3). Often these terms were used interchangeably with Probes, or at the very least often articulated as “probe-like” or, as P7 suggested, “inspired by Probes”. Many of the participants referred to the creation of bespoke materials (e.g., P1, P2, P3, P7, P8, P10, P12) that had a high degree of specificity in relation to the context under exploration. In many of these cases, the term “Probe” would often come to be adopted much later in their projects.

The interviews allowed us to explore some of the reasons for this diversity of interpretations. A key factor influencing these interpretations was their early contact with Probes and the ways in which they have become familiar with the approach and learned to apply it in their own work. For some of the interviewees – like P2, P3, P7, P8, P9 – they had worked directly with some of the originators or key authors of Probes. For these participants, it was possible to trace the ways a particular lineage of Probes had influenced how they then created and understood them in their own research practice. P2 mentioned: “*There’s this little idea of the authorship through these different Probes*” (P2), while P3 reflected that: “*I see myself being part of those Probes, like my subjective sort of [...] stamp is there [...] it’s very bespoke, very personal to me again and to the other person*” (P3). In these cases, it was also clear that knowledge around the creation and manifestation of Probes came through trial and error and, to some extents, a master-apprentice form of learning. These interviewees had learned mostly through doing, observation of a peer in practice, and small group critique in a design school spirit. All of this reinforced, for them, specific understandings of what Probes are and should be.

Not all participants learned through such relationships, however, and became familiar with Probes from published examples, documentation, and such to develop knowledge and competencies for making Probes.

However, in order to do this, these participants often drew on their existing competencies and backgrounds, which in some cases would come outside of a training in design. P6, for instance, was

Table 1: Overview of participants

Participant	Why did they use Probes?	How did they use Probes?
P1	To create mutual understanding within participatory, experience-centered design, sensitization	Co-designed bespoke Probe materials to facilitate conversations and intervene in the situation on a daily basis.
P2	For design ethnography within critical design, sensitization	Designed bespoke technological artifacts to be deployed in the context after an initial engagement, conducted interview study around the Probe returns.
P3	To explore materials and bodily interactions within craft-based design	Thinking through making the bespoke craft objects, which were then used as part of an enacted workshop performance to think together about these embodied interactions to inform digital jewelry.
P4	To enact a fictional scenario within speculative design	Created Probes as props to engage participants in a fictional world during interview studies.
P5	To elicit alternative perspectives within speculative design	Created task-based Probes to explore material affordances and alternative perspectives on the topic, sent them out to participants and discussed the returns in an interview study.
P6	For playful, spontaneous data collection ‘in-the-wild’ within speculative design	Created a collaborative storytelling game with tasks to be completed by the participants. The tasks were fit into the narrative to collect geo-localized visual and audio data in a workshop; “ <i>pressure cooking on the kind of probe format</i> ”.
P7	To disrupt conventional notions and co-ideation within critical design	Provided participants with a collection of half-finished concept sketches in advance for their completion, discussed the returns in a workshop.
P8	As philosophical objects to disrupt conventional notions within speculative design	Made bespoke task packets for participants to be circulated amongst them. Didn’t have an interview for returns.
P9	To solicit opinions on highly precarious situations within participatory design	Co-designed kits with a community for them to probe themselves and left them behind.
P10	To ask multi-sensory questions to solicit opinions within participatory design; sensitization	Created packages with creative tasks; had interviews around the returns; used them throughout the design process as moodboards for immersion and synthesizing ideas
P11	For playful, reflective engagement to facilitate conversations around abstract notions within participatory design	Created an activity to facilitate conversations around another topic; had regular workshop sessions for this activity.
P12	As material grounding to facilitate conversations within critical design	Created a task for participants to fulfill in advance to a performative workshop to facilitate conversations about the topic.

previously a semiotician and anthropologist, which influenced how they used Probes. They saw Probes as a form of storytelling that involved “*a little bit of showmanship [...] telling a good story is way more important than the material aspect of the thing that I give to somebody in hand*” (P6). Others that had come into design research from more social scientific backgrounds saw Probes as promoting dialogue with their research participants, to provoke reflection from them in new ways, and to gather more diverse forms of empirical data than “*traditional methods*” would allow. The fuzziness and vagueness of Probes in contrast to the conventional understanding of “*method as recipe*” [58, p.42] clearly enabled interviewees that came from other backgrounds to appropriate them in ways that align with their prior expertise and experience outside of the field of design, while also pushing forward the methods of inquiry they may have been trained in.

It’s important to stress, however, that the multitude of interpretations of Probes across the interviewees did not necessarily mean they lacked a criticality around the use of the term. The interviewees would bring the term into more and less into focus in their work as they developed it over time. As noted above, in many cases

the term Probe would come to be purposely used only later on in projects, and in some cases only when work became to be written up for publication upon peer-reviewers’ request. As P7 recalled, “[we] never called it a probe in the whole project [...] but when we wrote it for [Anon.], we kind of said like ‘Okay, this is like obviously inspired by Probes’” (P7). Similarly, P9 noted that the term may repel as much as evoke interest for those who do not share a design vocabulary:

“I tend not to use that vocabulary with participants, it just sounds weird and the word probe is, is kind of quite medical [...] they don’t necessarily have the same design vocabulary [or] the same language vocabulary [...] so that kind of misinterpretation can lead to quite a lot of confusion [and] not have the desired effect in making people feel comfortable about being involved.”
– P9

However, at other times, articulating their work as Probes was viewed to bring legitimacy to their approach which, in some context, may be viewed as lacking legitimacy. P9 went on to explain that: “*In certain groups of people you may talk [of Probes] because it’s a shortcut, right? You know you kind of say ‘Oh it’s a cultural probe’*

and everybody goes ‘Yeah, yeah, I know what you mean’ or you use it and people don’t know what you mean but they think ‘Oh that sounds quite interesting and we’d like to use it’ (P9). P6 further reflected that:

“Probe is the kind of perfect linguistic trade-off between sounding professional enough that you know what the heck you are doing [...] If I go to then say ‘Look, it’s a game. I make games. And these games are also Probes, data collection tools that I can use to actually understand what people are thinking’. This to my experience is the kind of boundary that I can push.” (P6).

It was clear that while few participants set out to explicitly create Probes, that the language of Probes was useful to adopt and appropriate in relation to articulating the more bespoke and situated work conducted on their projects. Each interviewee had their unique design vocabulary that could not be dissected from their phenomenological being, competencies, and disciplinary training. It was observed that their own vocabulary was in flux, something they were developing and learning, and Probes was a valuable term to anchor their work in relation to others: *“the viewers know what Probes are and there’s that sense of it and it’s useful to tie to that lineage” (P4)*. Indeed, P7 observed that:

“Everyone’s gonna always develop some variation of the method [Probes] [...] I think that’s a good sign for the design research community [...] it means that ‘Okay, we’ve kind of internalized what a probe was as a community and now we can just develop the one that makes the most sense to the project we’re in.” (P7)

Drawing on the lexicon of Probes brought legitimacy to their work which was highly contextualized and bespoke and involved a large amount of design activity. With all our participants, it was clear that they had reflected about what a Probe is, as well as the connotations of the word. The term ‘Probe’ was often used in a retrospective manner when communicating the outcomes of such processes to refer to the becoming of these things. As such the fuzziness of the term, and its openness to interpretation, was both a weakness and a great strength. Probes as a term was seen to be a valued reference point that brought legitimacy to a broad set of approaches and communicated, in general terms, what researchers had set out to do.

4.2 Probes as Amplifications of Practice And Material Questions

Although some participants had backgrounds outside of design, they all placed an emphasis on the ‘designerly’ aspect of Probes [66] and ‘thinking through making’ [93]. In doing so, they often referred to an open-ended iterative translation of ideas into materials and vice versa, and placed a great emphasis on the ‘practice’ of carefully making and materializing them in ways that have been noted in prior work on Probes [68]. Very often, the creation of what would become Probes was not necessarily grounded in any clear objective, research question or aim. The material qualities of Probes were seen to be highly valuable for a multitude of reasons. Several participants referred to how it *“amplified [their] tendencies as a designer” (P7)* and *“gives us [designers] materials that we’re*

comfortable to use.” (P2), hence they can be fun and rewarding as observed by [66]. It provided a way for some interviewees to ease their way into research: *“making was a way to reassure myself and relying on skills that I’m comfortable with. [...] It’s a language that talks back to me.” (P10)*. The creation of Probes themselves clarified, and helped to realize thoughts about the context under exploration as “a knowledge base for further explorations” [68, p.75]: *“I really see a lot of value of spending time and using Probes as a way of synthesizing [...] you create something that freezes your perspective or interpretation at that moment.” (P10)*. This was further echoed by P11, who reflected how they started to see their work as *“thinking Probes”*, stressing *“an interaction between how you materialize something or how you think about it.”* Similarly, the commitment to using physical materials, and the literal forming of Probes, would bring to the fore decision-making.

The material qualities of Probes were also critically important in how they engaged research participants in ways that more established methods and approaches would be unable to. Their specific value was seen in the translation of abstract concepts into embodied forms. P10 noted how Probes, in many respects, acted as *“embodied questions [...] a question that is translated into material aspect”*. The material qualities of Probes, and often that they were made specifically for a project or in some cases a specific participant, was felt to engage participants more deeply and avoid *“quite generic answers” (P5)* to questions, increasing the ‘credibility’ [66] and ‘sincerity’ [33] and the ‘specificity’ [28 in 69, p.48] of the approach. P3 articulated their way of understanding Probes as *“objects with questions”*, elaborating that: *“they’re objects that ask questions [in] gentle, imaginative, surprising often ways. [...] usually Probes have a written question, but for me, the magic happens when you don’t use often a lot of words, but the object itself asks the question [...] through the form, the materials.” (P3)*. This was echoed by P8:

“I always thought of them as sort of physical questions, where you’re making, in the making of it, you’re working through some assumptions and you’re kind of giving them to people to complete in, to interact with them in a certain way [...] it’s not like a questionnaire or anything where very straightforward answer they can give.” – P8

How the materiality of a Probe could forefront questions and issues at the heart of a project was also seen as a way to reveal assumptions and taken-for-granted ideas on the behalf of our interviewees research participants. Our participants also echoed prior work on Probes, which has shown how the making of Probes themselves can build empathy for future participants [59, 68, 92] or help externalize the researchers’ own assumptions prior to engagements [69]. This was seen to be especially important in the context of work on digital technologies which are often felt to be underpinned by black-boxes, the functioning of which is often hard to fathom without props. Perhaps in part because of these perceived qualities, Probes would often be talked about as *“tickets to talk” (P4)* and as part of techniques to promote *“dialogue”* and develop a *“shared vocabulary” (P11)* with participants around complex topics. In some cases, the use of Probes to materialize immaterial qualities of technologies and designs was seen as an act to challenge participants to scrutinize the systems they use and the environments they live in.

However, even when carefully considered, the material aspects of Probes can also present some challenges. Several interviewees spoke of the ways in which their Probes at times challenged participants too much, as a result of their unfamiliar nature of posing questions compared to other, more commonly understood forms of research. Probes were sometimes seen as confusing, too abstract, or “*kind of obtuse, slightly complicated*” (P9) for research participants, where the openness of Probes could lead to exploration and uncertainty at the same time [69]. Indeed, several participants reflected on how the material qualities of Probes needed to be considered with careful consideration for the specific contexts within which they would be used [69]. For example, P1, who worked in refugee camps, pointed out to how materiality “*needs to be familiar, also needs to be something that they can relate to and see how it connects to our research, and also connects to their lives and understanding of lives*” in order to avoid creating barriers in between with their participants. As we will explain next, the considered labor in the creation of Probes was often a result of wanting to do good for participants and demonstrating that, and considered a worthwhile investment. As opposed to the understanding of method in linear terms to rationally solve a problem and reach closure, the reflective practice of materializing ideas and vice versa, was instead seen to be an exploratory and problematizing process that was based on creating difference and divergence [64], and this was reflected in how our interviewees spoke of their process of making Probes.

4.3 Probes as Manifestations of Care for Others

Building on the concerns around the careful and considered materialization of their Probes, interviewees also sought to challenge some of the taken for granted dichotomies between researchers, designers and participants in HCI Research. This came through in particular through demonstrating sensitivity to people’s lives and signifying reciprocity. For instance, after a set of initial visits to their participants’ homes, P2 explained how they designed their Probes to make them “*fit in that space*” in a way that was “*highly curated [with] a lot of sensitivity to colors and design*”. Beyond demonstrating thoughtfulness, it was an attempt to build relationships with participants: “*the Probes are a way of expressing a design intent and a design professionalism [...] they clue the participants into the kind of people that we are and give us a way of demonstrating, like building a relationship with the people as well, and demonstrating care and deliberacy.*” (P2). P2 further noted that the care is inherent in working to provide a unique experience through bespoke and customized artifacts: “*the process of having something bespoke designed for you, and then having that delivered and experiencing that is pretty amazing actually.*” Many interviewees would frequently speak about how their participants would react positively to Probes, and refer to the care and thought that had gone into their production. P5 noted how “*people were explicit about the fact that they liked these objects*”. P10 reflected on how the considered creation of Probes would leave a “*good impression*”: “*I remember one saying, ‘Oh, you could have not bothered, you could have just done a questionnaire but no, you went into a lot of trouble’. And I think that really demonstrated my motivation, the effort I put in making those things for them.*” (P10).

P10 went on to also refer to the importance of carefully created Probes in building trust and rapport with their participants, especially for projects conducted over extended periods of time. This

was echoed by P11, who explained the act of handing over a probe was “*like giving a gift to someone more even than you’re trying to get data yourself for your research*” (P11). Probes also often left behind an awareness and care for a cause; P8, for instance, explained how their participants’ reported enduring recollections of their work every time they witnessed food waste, even years after their engagement with their Probes to explore the non-intentional food waste at home. By demonstrating care, it was also felt participants might be more inclined to reciprocate care back. P5 noted how their research participants appeared to feel it was “*necessary*” to show that “*care that had gone into fulfilling them and spending time and then taking the time to talk to us*”. At the same time, as P8 discussed at length in their interview, the materiality of Probes and their carefully thought through creation reflected the willingness and effort to “*give something of your own*”, to make participants not feel that they “*have to give me everything, instead of the designer putting something back*” as they may in “*very researchy*” modes of engaging like questionnaires (P8).

This is not to say all interviewees supported this idea that the creation of carefully realized, highly polished, Probe materials was a signifier of care. P1 reflected that such designerly statements of care may also be viewed as an unintentional display of privilege and distance the researcher from their participants. In P1’s context, where they were working with various marginalized communities and within refugee camps, care needed to be demonstrated by using familiar materials that “*are not saying [we are] being lazy*” but “*don’t have so much inherent value in the material*”. They further reflected:

“[in one case] *it looked very refined and then participants in the camp were really hesitant on passing it around. They were hesitant with the children grabbing them and ripping them apart, so the formality of it, kind of in the material, the way that it looked, I think, wasn’t the best [...] They need to be very comfortable with the materials that they use, in the way that they express themselves, or else, again, it’s me coming in with assumptions of what’s the best way to design.*” – P1

There were also cases where this messiness of the situated practice of Probing blurred the boundaries between the researcher and the researched in challenging ways. P1 referred to the ongoing negotiations around “*consenting and re-consenting and re-consenting*” to make sure both their participants and they as the researcher were comfortable with their personal involvement in each other’s lives and boundary management during the research process. They reflected that “*we don’t report [this] much in HCI [...] when we are doing this type of work*”.

These examples overall demonstrate how Probes enable care through reciprocity by humanizing not only the participants [38] but also the researcher, therefore subverting the idea of the researcher as a detached, neutral observer. Furthermore, as noted for P8 and some other interviewees like P7, there were other inherently subversive aspects of care, which was to challenge the existing hegemonic practices and preconceptions about a range of issues related to conducting design-led research, in contrast with the normative stance of the researcher. This is explained further in the following theme.

4.4 Probes as Subverting and Facilitating Small Politics

Whether using Probes to explore futures or to find alternative framings for a contemporary design situation, subversion was a key common concern for all participants. For some, subversion was overt in the topic of inquiry. For example, P8 used Probes to “*disrupt [...] stereotypical ideas of what a home is*”. Others were more explicit about using them to disrupt the trajectory of the present towards alternative futures, acknowledging their potential deviancy from the original Gaver et al. [31] work. For instance, P4 used Probes as an entry point to an open-ended, unfinished design fiction. When distinguishing their sense of Probing from others, they hinted at the temporal qualities of Probes:

“these are not Probes in the Gaver sense [...] these artefacts are design proposals really of a sort, framed in a particular way, but actually for me, they are mostly about the ticket to talk thing, they’re mostly about being something to talk about and making that conversation easier, [...] I think the Gaver style of Probes relies on inspiration from what’s around you but [...] when you’re trying to get participants to think [in a] future-oriented way, you know, you have to pull them further.” – P4

Although their work was very different to P4’s, P9 made a similar point about the future-orientation and interventionist qualities of Probes:

“there’s two aspects that design is working to achieve [in the project] facilitating these conversations with young people through Probes around their understanding of demolitions and what it means to them, and how they resist the [Anon.] occupation, and then we will take these kind of artifacts and use them to reimagine policy for the [Anon.] government and how they allocate aid [...] it’s much more about kind of future thinking than it is about how do we understand what is there now. It’s about how we reimagine [Anon.] policy.” – P9

One critical aspect alluded to by P9 here is the value of Probes and creative activities is in enabling participants to open up and engage in dialogues that involve subversion without necessarily opening them up to potential dangers. Continuing their example, P9 went on to explain the significance of this in their work:

“The strength of doing this is that because, if you try and ask somebody about politics within [Anon.], they either open up too much [...] or they won’t say anything at all [...] this is obviously about the challenges of the political situation, without being political with a big P, it’s like small politics, [...] it allows people some space to talk about politics, but in a safe way. [...] we put the [Probes] on the table, and people are immediately wanting to engage with them and are intrigued about what is in them and what the questions are.” – P9

There is an indication in the examples above that reflects how design research dealing with the world as it ought to be subverts the hegemonic notion of research, which is about studying the world as it is [81]. This was especially important for P1 and P9, in part

because their work involved working with marginalized, yet super-surveilled [73], communities like refugees in camps or habitants of a conflict zone. P1 explained how they engaged in a process where their participants collaborated with them in selecting the methods of enquiry for the project. They noted how: *“they did have the option of an interview and a focus group that they’re like ‘Oh we’ve never done this method before’ [...] they afterwards told me, ‘Oh people always come here and interview us and leave’. Whereas when you start using design materials, you’re actually, you’re, you’re making a longer-term commitment.”* They went on to also explain that later into the research, one of their participants recounted to them how *“If someone comes here to just interview us and leave, we’re saying no”* (P1). In this regard, not only designing, but also conducting design research is doing *“small politics”* as described by P9, especially if aiming to engage people in the process in their own contexts. Indeed, P1 further reflected that: *“[For me] It’s all about creating shared understandings of what the research is, what the data is, of each other [...] the most natural things to do then, is, if you’re trying to create a shared understanding, it’s actually share the decisions regarding what to do.”* (P1).

The examples shared by P1 and P9 were the most explicitly politically charged contexts shared with us by interviewees, but this is not to say such *“small politics”* and the creation of resources for did not exist elsewhere. For instance, in P2’s work the notion of Probes being a resource for action was subtle; the Probes were to enable ways for their participants to reflect on and reconsider their experiences of their home. P10 was also involved in *“small politics”* by giving voice to their participants through a manifesto that embodied their collective Probe returns and could be used as part of future advocacy activities. Similarly, P5 explained how a key component of their work was on eliciting alternative understandings from marginalized communities on cross-cultural heritage and sharing these back. They reflected that the legacy of their work, for them, is *“to think about, [...] what are our responsibilities towards this kind of material beyond just explaining people what we’re going to do with it and going through ethics procedures and being upfront?”*. Again, this reinforced a view that for our interviewees Probes, and the wider projects they contribute to, aim to draw out oft-ignored narratives and concerns about matters that concern research participants, and challenge the taken for granted view that research is ‘done’ to people by researchers, who own the intellectual property.

When asked about the challenges to working with Probes, it became clear that the issues around legitimacy were not resulting from Probes themselves, but from the higher-level issues around fitting such counter-hegemonic design-led research practices within the field of HCI. P8 emphasized that *“the reflexivity is so ingrained in the whole probe approach that it’s, kind of, really forgiving”* in regards to framing the rich (referring to *“the wide focus and the diverse and subjective ways in which the people have expressed themselves”* [68, p.76]), yet fragmented and somewhat deemed invalid data they provide. P12 similarly expressed:

“I think these challenges [issues of legitimacy] don’t come from the Probes [...] that challenge comes from this kind of scientific domination, or the domination of scientific quantitative research that has in the past

always been presented as more valid [...] and qualitative research is deemed valid in certain, sort of very regimented ways if it's done almost scientifically, and also art-led research is considered valid in certain ways but not always and there's very often this notion that it has to be validated in terms of how it will be evaluated [...] And so I believe that the limitations really rests in these frameworks of what is valid, if that makes sense."
– P12

What comes through the interviews is a level of sophistication in how the design researcher participants understood their Probes and the roles their materials were playing in relation to the existing practices and enabling people to move towards future situations. Indeed, perhaps at odds with how Probes are often reported on in the literature, there was a clear purpose and intentionality in the creation of Probes beyond cheaply gathering data from participants.

5 DISCUSSION

With this study we set out to unpack how design researchers interpret Probes. Through talking to a divergent group of design researchers, we have come to see a plurality of critical meanings, interpretations and understandings of how they are used in research and practice. In the following we unpack these insights further in relation to prior work on Probes and debates around the nature of practice-based design research in HCI.

5.1 Valuing the Fuzziness of Probes

It was very apparent that our interviewees embraced the fuzziness of Probes in diverse ways of defining and using Probes in their RtD activities, in line with Gaver's skepticism to formalize them as a methodology [32]. Probes have come to be known for their ambiguous qualities that draw their participants into open-ended, and sometimes purposely ill-defined, activities; but our analysis revealed that Probes as an umbrella term has also become a metaphor for critique within the RtD approach. This is not only because of their historical significance as a particular critique of method in HCI, but also because of their openness to interpretation as a metaphor [55], almost like a "Rorschach test, revealing their uptakers' perspectives and preoccupations" [10, p.1082]. Designers are said to be "educated to work with ambiguous topics, with incomplete knowledge, and to look for new ways to approach existing issues" [68, p.73], often working with metaphors as a creative tool [5]. Trained designers often value this versatility and openness to interpretation rather than completely disregard them as an 'ill-legitimate' approach to research. Our findings also emphasized that the ambiguity around Probes as a concept is *made into* a problem in HCI rather than actually posing a problem for design researchers. By framing the original Cultural Probes as a critique of 'method' in HCI and emphasizing the practices of critique enabled by the Probes, we imply that attempts to formalize or police Probes would strip them off their intended critique and the reflective practice of interpreting them. As Butler reminds us, "critique is always a critique of some instituted practice, discourse, episteme, institution, and loses it loses its character the moment in which it is abstracted from its operation and made to stand alone as a purely generalizable practice" [emphasis in original] [14]. Instead, similar to Reeves and Beck's

review of how HCI talks about the phenomenon of interaction, we believe that the explicit articulations of the divergent concepts of Probes could create "a site of productive conflict" [74, p.144], and in doing so, perhaps "bridging gaps between increasingly disparate HCI communities" [74, p.150] and the fragmented nature of their knowledge production within HCI [40].

The ambiguity surrounding the lexicon of Probes was seen to be especially valuable when trying to develop creative methods that were specific to a particular design situation or context, but still ensuring there was legitimacy to the approach taken. Wary of the concerns around the epistemological consistency of Probes, we asked our interviewees to make explicit how they interpret "the powerful metaphor of the 'probe'" [63, p.86; italics in original], and found out that they had indeed critically reflected on the implications and epistemological commitments of their interpretation of the Probes for their practice. They were critical and cautious of not using Probes as shortcut substitutions for deep qualitative and ethnographic work, but instead emphasized the supplementary, catalyzing or enchanting qualities of Probes for such work. This demonstrated, to us, that there was an ongoing sense that the fuzziness of Probes can still lead to issues such as Dourish's claimed "discount ethnography" [25, p.548], and that design researchers were prepared to defend and articulate how their work was not such.

Furthermore, the fuzziness and fluidity of how Probes are defined also, ironically, meant design researchers suffered at the hand of some policing of the term. Beyond what we reported in the Findings, we saw cases where our participants had set out to not create Probes, yet peer-reviewers in the research community demanded these be located within its discourse for publication. Boehner et al. [10] noted the dangers inherent in the reinvention of Probes as method within HCI [35], where a community commonly accepts the validity of 'Cultural Probes' as a taken-for-granted method, without critically scrutinizing how it deviates from them in essential ways. While the creation and utilization of Probes in projects comes with certain values and positions that should cohere, their manifestation and materialization may be very diverse as our interviews revealed. In simple terms, the citation of the original work, and the brief locations of one's own approach in relation to that, should not be used as a self-referential proxy to legitimize the method. As P9 pointed out, this has an impact on the "currency" of the word. To enforce citation and reference when not appropriate is to fit the approach into the rigid and highly regimented knowledge systems that still pervade HCI; and in doing so, it makes less legitimate the situated, contextual and provisional nature of knowledge from RtD [34] and which seems to be so valued by the participants in our study. Our findings show how the hegemonic uptake of methods is "subject to circulations, negotiations and frictions as well as individual and collective aspirations" [2, p.481]. As such, the ongoing conversations about Probes as a design-led approach to research should include explicit discussions of the power struggles and complexities around conducting design-led research in HCI [48], reflections on design's processional character and relevance to scientific research as "a means to critically reflect on HCI's practice" [86, p.66]; or as we refer to it, its intended critique. Our findings emphasized the designed nature of Probes and also how they were implemented as part of designed, even staged processes that had a

significant impact on how they worked. By reporting on the critical motivations to use and cite Probes, as well as the reflective practice of making them as in the example of [12], the latent critique in the original Probes and its increasingly divergent interpretations may be turned into a productive discussion about the normative conceptions of method, research, and ‘user’ within HCI. Wary of the concerns around “theoretical hygiene” [82, p.2 in 5, p.493], tracing and documenting design processes as well as outcomes [53] can make this valued approach more accessible for the wider community of HCI and work against the gatekeeping of design research know-how.

5.2 Humanizing Research through Probes

Building on the above, the literature on Probes have referred to their potential for “humanis[ing] the participants” [38, p.33]. Our findings emphasized that Probes aim at expanding or pushing the boundaries of a ‘user’ rather than accurate representation of them [41] or of design specifications [68]. This was echoed in the way Probes were used by our interviewees to disrupt stereotypes and critique conventions around a given design situation. As highlighted by [51, p.156], the value of Probes lay in their capability to initiate personal conversations around its object of inquiry, as opposed to presenting a prescriptive ‘method’. As such, Probe artifacts are “not solutions to any problem”, but “rather a way of soliciting further reflection providing a situated ticket to talk” [15, p.435]. The majority of our interviewees had follow-up interviews with their participants in order to discuss what could be otherwise obscure in the Probe returns [62, 69] and to support design empathy [68]. This enabled *humanizing* participants on a deeper level than the abstracted analysis of Probe returns as “[s]orting through masses of maps, cards, and photographs” in the original work [31, p.27 in 68, p.68]. Because these dialogical sense-making processes between the research stakeholders through Probes is performative, “the way of *practicing* these dialogues matters” [36, p.314; emphasis in original]. As mentioned by our participants, the structure and staging of these interviews following Probe returns could be investigated further in terms of individual and collective sense-making and how this influences the way Probes are designed and made to work, as mentioned by a few of our interviewees.

As our findings have shown, the situated practice of Probing makes it a dialogical process that *humanizes* the researcher (or the research team) as well. Design’s processional character also requires making visible the unfolding contingencies involved in the situated practice [86], especially for the Probing process that could go “almost on its own, going beyond designers’ or researchers’ control” [69, p.37]. Historically in how studies are reported in HCI, the humanity of the researcher is either taken-for-granted (as part of the humanistic approaches acknowledging and embracing subjectivity) or neglected on purpose (to legitimize the research to make it look objective). As part of the strategies and considerations to make Probes work [69, 92], our interviewees mentioned the *informal* interactions within their research team as well as with their participants, echoing [42]. Although *informal*, these pre-Probing engagements were central to the small politics of design research in terms of building rapport, expressing intent, setting boundaries and managing expectations from the research and the stakeholders involved in the research. Given the exploratory, non-deterministic and

drifting nature of design [54], these *humanizing* engagements that are often neglected in the dissemination of Probes had an influence on the success of Probes. While this was not an explicit concern for some of our interviewees, it was especially a concern for those that worked with Probes in sensitive contexts with complex dynamics of research and the people and stakeholders involved. Gaver was explicit in how they wanted to reveal themselves in the process [32], but their revelation was more related to authorship within the aesthetic accountability [54] of their artist-designer tradition. On the other hand, we observe that our interviewees appropriated Probes to enhance participant empowerment in the Probing process on a range of levels (P1, P5, P9, P10, P11), which were negotiated through often unreported *informal* engagements throughout the process.

The humanizing qualities of Probes have been previously reported to enable remote research without the researcher being present in their context of inquiry at all times [83], providing a feeling of researcher’s presence for the participants and vice versa when returned [66, 68]. It has been argued that the lack of researcher presence requires further reflection on the researchers’ accountability and subjectivity in the research process [63] in order to understand “the way that the designer’s authority is subtle and nuanced” in comparison to more overt expressions of authority [18, p.440]. Our findings accentuated the designed nature of Probes and how the decisions around the materiality of Probes were made with extra care and attention for these subtle expressions of authority, especially in cross-cultural, historically or socio-politically charged settings (P1, P2, P5, P8, P9). Although these considerations are not always reported in depth, acknowledging and reflecting on these subjectivities are important even when the Probes may be used for design inspiration than information [83].

Like in social sciences, reflexivity brings to the fore the human factors involved in the research process; however Probes “embody a different set of sensibilities from most other social research methods” [11, p.185] which brings forth different forms of reflexivity and humanization. However, as identified by Taylor et al. [87], the experiences, emotional responses and lived accounts and motivations of design researchers are often missing from the narratives of research papers. Our participants’ accounts of their projects articulated how their dispositions were not just critical in how their Probes manifest materially, but also in how they situated their Probes in relation to the lineage of prior Probes research and adapted these for their own expertise, interests and disciplinary strengths. To avoid accounts of such disposition also neglects the “*small politics*” of design (as P9 expressed it) in studying *what ought to be* than *as is* [81]. Moreover, the bracketing out of the researcher as the detached, objective researcher or limiting the presence of them [16] promotes a realist tone in reporting [76], reinforces certain ideas in HCI like scientism [34, 95], and therefore raises doubts about the legitimacy of such humanistic approaches to and accounts of design-led research [87]. This is particularly important for the reporting on Probes, which were “purposefully against scientism” [69, p.34].

Not only because of involving participants in the Probing process, but also because of the inherent critique in design practice as to *what should be* [81], Probes blur the boundaries between the researcher and the researched, and the fundamental ontological demarcation of research as the controlled study of the world as

it is, positioning the “*small politics*” of research perhaps closer to activism than imagined (as alluded to by P1, P5, P9, P10). As a result, matters of care [4] that are especially important for emotionally charged or socio-politically complex situations are not reported enough. Indeed, we saw in some instances the great tensions that come about between caring too much about the research in order to engage in the bigger politics of situation and a concern with coercing participants into the ‘burden’ of Probes as opposed to the small politics of caring for the participants. The blurring of these boundaries require constant, iterative reflection on and re-negotiation of these boundaries, and in that way, Probes become a ‘burden’ on the researcher as much as their participants. Revealing the researcher in the process [32], but also *humanizing* them, is critical in understanding the tensions around situated, ‘real world’ practices of Probing, as opposed to bracketing the researcher in theory-based, abstract methods.

5.3 Probes as Relating, Questioning, and Owning

Although they did not originate in participatory design tradition, Probes are increasingly used for their qualities as ‘boundary objects’ [84, 85] as part of participatory design practices [49, 50]. This is often implied in how Probes are referred to as a facilitator for co-exploring with non-designers [68], “as a way of structuring open questions and reflections” [17, p.2519], and “as a bridge between designer and participant to enable alternative modes of discovery in design research practices” [21, p.699]. While all our interviewees cared for their participants and found ways to include their participants in design processes through the use of Probes, there were very different understandings and framings of what constituted ‘genuine participation’ [75]. In [39], Gaver reflects on the ways Probes unsettle the typical relational dynamic between researchers and researched; they force researchers to reveal something of themselves to participants, and they involve activities that are playful and rewarding, giving back to volunteers as much as researchers take. These were all concerns that the design researchers we interviewed had as well. By authoring Probes in a way that spoke to their research imperatives and sensitivities as a design researcher, they wished to share a bit of themselves to their participants. This was done to build relationships with participants, to gear them into where the researchers are coming from, and suggest a degree of reciprocal engagement and mutual learning. Through these, our participants saw Probes as unsettling the traditional dynamic in HCI where participants are treated as subjects, studied by researchers. Where that happens, issues around “reflection and learning processes as well as communication of the probing aims and results” become important [68, p.74].

Yet to a degree, it was notable how in some ways Probes were described by some of our participants as reinforcing some of the traditional divisions between researcher and subject in HCI. While care and consideration was given in the creation of Probe materials, they were still seen as questions to prompt a participant in order to study them without accounting for the political legacy of the Situationists [57]. Herein, the designer is still positioned as the expert, even if great care was shown to deliberately disrupt the

expectations around expertise [31]. While this was explicit in the way P3 referred to their Probes as “*object questions*” (P3), it was implicit across many of the other interviewees (e.g., P2, P10).

On the other hand, some adopted a very strong participatory approach where the designer took on the position of a facilitator than an expert. These were also made explicit in the way our interviewees talked about their Probes as “*dialogical tools*” (P1), or “*mediation tools*” (P11), and also how they referred to their participants as “*research partners*” (P11). They also mentioned the reciprocal and dialogical exchanges that went beyond the Probing stages of the research; where Probe materials were used not only to promote reflections on and articulations of anxieties and aspirations for the future (as noted by Gaver [32]), but to scaffold future action among groups “from personal attitudes to long-term collaboration” [68, p.77].

This is not to be critical of our participants that set out to not be participatory; indeed, these participants often articulated a critical stance against such work or challenged the value of such work in their specific context in order to avoid ‘the tyranny’ of participation [19] where Probes could turn into an obligation [60]. Rather, we highlight here the increasingly blurred boundaries of HCI work grounded in the artist-designer tradition, and that the dichotomy posed by Gaver [32] around the role of the designer as expert or servant is increasingly less clear. The making of Probes includes “vague guesses of what there could be today and speculations on future possibilities” [68, p.74], inherently aiming to critique and intervene in the existing situation without being overtly political. Both come with politics and subversion at the heart, it’s the nature of how participation is configured [90] and degree of control participants have over owning and actioning knowledge that differs and its dissemination. As tangible representations of their intended subversion, Probes make the otherwise invisible *small politics* by creating situations [47] similar to ‘breaching experiments’ [30] and “allow a place and a time to make space for exploration” [68, p.76]. The debate around Probes in HCI proves that that design’s inherent critique has not “run out of steam” [56, p.225].

6 CONCLUSION

In this paper we have set out to understand the ways Probes, as a contested approach to research in HCI, are interpreted, used and made sense of by design researchers in contemporary RtD. While there has been much debate surrounding Probes in the design research literature, there has been a lack of work focused on experiential accounts of Probes in practice. Through our interviews with a diverse group of 12 design researchers, we have examined some of the motivations for using Probes in HCI projects, how design researchers engage in the material production of Probes, and how these have then been used to scaffold research participant engagement. Our participants highlighted that while there continues to be a lack of a clear definition of Probes in the field, the flexibility and fuzziness of the term enables it to be adapted and repurposed in ways that brings legitimacy to design-led research. We highlighted key qualities of Probes that are often either taken-for-granted or under-articulated, including the ways they manifest care for participants and subvert traditional notions of research in HCI. As well as highlighting the legitimacy of Probes and design-led research

in the field, we revealed ongoing challenges in how we report on Probes. Crucial aspects of the reflective practice of making and implementing Probes is often omitted, as is researcher reflexivity in situated practice of making and utilizing Probes. We intend this work to stimulate further research on the small politics and subversive nature of Probes, and hope to initiate a new lines of HCI enquiry and scholarship that reports on the often neglected details of how Probes are conceptualized, made, shared and understood by researchers.

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