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Constructing the Cool Wall: A Tool to Explore Teen Meanings of Cool

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ABSTRACT

This paper describes the development and exploration of a tool designed to assist in investigating 'cool' as it applies to the design of interactive products for teenagers. The method involved the derivation of theoretical understandings of cool from literature that resulted in identification of seven core categories for cool, which were mapped to a hierarchy. The hierarchy includes having of cool things, the doing of cool activities and the being of cool. This paper focuses on a tool, the Cool Wall, developed to explore one specific facet of the hierarchy; exploring shared understanding of having cool things. The paper describes the development and construction of the tool, using a heavily participatory approach, and the results and analysis of three studies. The first study was carried out over 2 days in a school in the UK. The results of the study both provide clear insights into cool things and enable a refined understanding of cool in this context. Two additional studies are then used to identify potential shortcomings in the Cool Wall methodology. In the second study participants were able to populate a paper cool wall with anything they chose, this revealed two potential new categories of images and that the current set of images covered the majority of key themes. In the third study teenagers interpretations of the meaning of the images included in the Cool Wall were explored, this showed that the majority of meanings were as expected and a small number of unexpected interpretations provided some valuable insights.

Keywords: *teenagers, cool, interaction design.*

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1. Introduction

Good interaction design is governed by the maxim that to create engaging and enticing products and technologies, the designer has to understand the user. Many methods exist for better understanding users; some of these aim to describe users

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based on models, personas and scenarios, others aim to take a more holistic view by embedding the design team in the intended population or context and thus giving the designers empathy and understanding of the user group. Often a designer is considering a user group or user context with which he or she is broadly familiar; even then, misunderstandings can occur when a designer incorrectly models a user based on some biases or assumptions that he or she brings to the design space.

Designing for children and teenagers is one area where the gap between what is considered to be understood and what is actually understood can be large. Adult developers and designers may assume they know about children and teenagers on the basis that they once were in that grouping, but each generation has its own unique motivations, values, culture, understandings, technologies, and ways of appropriating technologies. Most of these factors will perhaps only ever be fully understood by the teenagers (or children) of that particular era.

This paper has two interlinked aims, firstly to develop a robust tool to enable the exploration of cool in the context of teenagers, and secondly to provide insights into the shared understanding of having cool things. Both of these aims are within the broader context of understanding how to design cool technologies to engage teen users.

2. Engaging with Teenagers in Interaction Design

The process of directly involving end users in the design of their own technologies derives from the socio-technical and participatory movements of the last century (Blomberg and Henderson, 1990; Muller, 2001). The underlying principle behind these approaches is that by engaging users in discussion around technologies they might better accept the subsequent technologies when they come into use (Schuler and Namioka, 1993; Simonsen and Robertson, 2012). In the field of HCI, talking with, working with and designing with end users is seen as good practice (Abowd and Beale, 1991) and Participatory Design has been referred to as the ‘third space’ of HCI (Muller and Druin, 2010); that resides between domains of users and developers.

Most of the work in this field has focused on adult users but following early work by (Druin, 1999a; Druin, 1999b; Kafai, 1999; Scaife, 1997) more and more research studies employ participatory methods in work with children – both to give the young people a say but also, and possibly more importantly, to allow the research team to

better understand these populations (Mazzone, Iivari, Tikkanen, Read and Beale, 2010). Examples include (Druin, 1997; Garzotto, 2008; Guha et al., 2004; Read, 2009).

Published work on participatory and informant work with teenagers is relatively scarce. This may be because the interaction design community has shied away from engaging with this population or may be because there are few research projects concerned with designing for this group. Certainly when it comes to actively involving teenagers in research and design projects there are very few studies and those that are reported typically position the teenagers as users or testers rather than as informants or design partners (Batson and Feinberg, 2006; Coyle and Matthews, 2004).

3. Cool as a Design Requirement for Teenagers

In much the same way that there is little work on designing with teenagers, there is also a shortage of published work on designing for teenagers. Designers and developers often design products based on a set of guidelines or heuristics; the HCI literature is littered with papers that provide guidelines – some of these are very specific for example (Read, MacFarlane and Gregory, 2004; Stanton, 2001) whilst others are very general e.g. (Nielsen, 1994; Shneiderman and Plaisant, 2004).

The more general that guidelines are, the less useful they often appear as, in designing a product, the designer will have a complex set of requirements that require understanding of several different guidelines – for example a product might be required that is mobile and engaging for teenagers – the hapless designer will go in search of guidelines for mobile design (Gong and Tarasewich, 2004; Sharples, 2000) and will then look for guidance on designing for teenagers – here he or she may come unstuck.

To design engaging technologies for any user group it is necessary to understand what it is that they engage with. One approach to understanding this space, in the specific area of designing for teenagers, is to come at teenage engagement from the perspective of designing ‘cool’. Cool is, in their own words, ‘owned’ by the teenage community (Danesi, 1994). It is considered to be what teenagers are and what most adults are not; thus - in understanding what cool is from the perspective of teenagers it may be possible to distil guidelines for the design of engaging products and technologies for this population.

4. Theoretical Understanding of Cool

The literature in marketing and psychology contains several papers that examine what it is to 'be cool' e.g. (Nancarrow, Nancarrow and Page, 2002; O'Donnell and Wardlow, 2000). These studies concur that within 'cool' communities such as a teenager's peer group, it is assumed that people can identify that certain things and certain people are 'cool'. Cool has been variously described by many different commentators – some take a view of cool as being very much about consuming, others focus on cool as it applies to behaviours (O'Donnell and Wardlow, 2000; Tapp and Bird, 2008). From the literature, the authors have previously distilled the following Essential Categories of Cool, these are summarized in Table 1 (Read et al., 2011).

CODE	Explanation and References
REB	Rebellious and / or illicit (probably has some socially or morally unacceptable line to it) (Pountain and Robins, 2000).
AS	Anti social (encourages anti social behaviours – maybe avoiding the need to mix with others or encouraging anti social behaviours like bullying and violence) (Pountain and Robins, 2000)
RET	Retro (clearly from a previous era) (Nancarrow, Nancarrow and Page, 2002)
AUTH	Authentic – the real thing (more about items that are 'the must have' brands – and maybe are 'hip' or trendy at the moment) (Nancarrow, Nancarrow and Page, 2002), (Schuler and Namioka, 1993).
RICH	Many desire – affordability issues – big money (probably less about brands and more about features – where having this item would mainly signify you have a lot of money to spend) (O'Donnell and Wardlow, 2000).
INN	Innovative - original (something that is really a bit of a surprise – where – on encountering this thing – people would be impressed by it for its unusualness rather than for any of the other items above) (O'Donnell and Wardlow, 2000).

Table 1 - Essential Characteristics of Cool

In (Read et al, 2011) where these categories were first described, the authors derived a hierarchy of cool as shown in Figure 1.

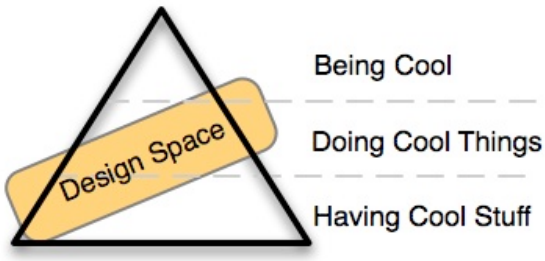

Figure 1. The Hierarchy of Cool

At the top of this hierarchy there exists the 'holy grail' of cool – that is 'being cool', in a rather bigger space, and more accessible there is the behaviour of cool (doing cool), and lastly, and most common, the having of cool possessions ('stuff'). The design space is primarily situated in the 'doing cool' zone but has an overlap into both 'being cool; and the having of cool possessions.

In our previous work (Read et al, 2011), discussion focused on the relationships between the categories from the literature and the Cool hierarchy. Some aspects, for example REB, (rebellious) AS (anti-social) and INN (innovative) were hypothesised to be mainly associated with the 'doing' of cool; others RET (retro), AUTH (authentic) and RICH (high value) were hypothesised as being primarily about items or products (as in having).

The Cool hierarchy is therefore seen as a beginning point for understanding cool – further work is needed to better understand each of the three layers especially in regard to the layers' impact on interaction design. To begin that work, this paper starts at the base layer of the hierarchy where there is considered to be the greatest density of cool. In the study this base layer – the having of cool possessions – is unpicked. The authors began with a premise that there is a common understanding amongst teenagers of what cool is, but also with the expectation that within this general understanding there might be some 'things' that would be considered less or more cool by certain subgroups. 'Things' refers to physical objects, primarily possessions (e.g., a type of technology) or other physical items that we choose to consume (e.g., a specific kind of food) or associate with.

5. Designing the Cool Wall

While the model of cool provides a theoretical framework to understand the salient facets of cool, pragmatic insights are needed to explore whether there is a shared

understanding of what is cool or if, for example, opinions are polarised within a specific community or peer group. These extra insights are needed to, for example, begin understanding how to design technology that can be appropriated in cool ways. Believing in participatory approaches and user involvement, the authors aimed to investigate this area with teenage informants.

5.1 The Cool Wall as a Research Tool

To this end the 'Cool Wall' prototype was developed, intended to be deployed in the field and used to collect insights into cool preferences in a simple and low-cost manner. The Cool Wall provides an interactive visual tool for allowing pictures to be sorted into four categories ('serious uncool', 'uncool', 'cool', 'subzero') using a touchscreen (Figure 2).

The idea for the Cool Wall is taken from a popular UK BBC television motoring programme called Top Gear† where the presenters of the TV show place photographs of vehicles on the Cool Wall according to their categories of cool. The categories used on the programme ('serious uncool', 'uncool', 'cool', 'subzero') are the same categories that have been used in the studies in this paper as, due to the popularity of the TV show, these were known to be well known and understood by most teenagers in the UK.

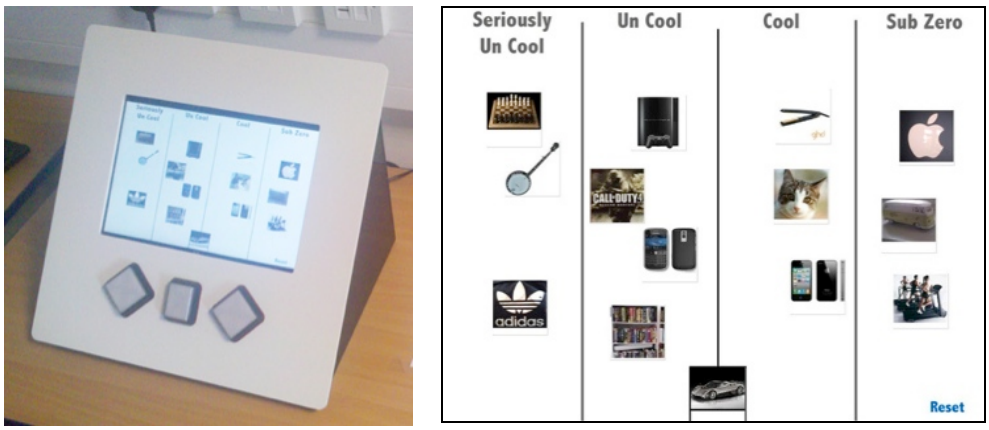

Figure 2. Cool Wall Prototype (left), Screen capture of Cool Wall Application (right)

The Cool Wall concept, for the study of cool, was chosen as it provides a simple and visually engaging way of classifying the 'coolness' of objects and also supports collaboration. The interactive cool wall prototype used in this work presents an image at the bottom of a touchscreen interface which is then dragged to the desired category, the next image then appears until a predefined sequence of images is complete, a

† http://www.topgear.com/coolwall/

'Finished' button is then shown which saves the classifications of the images. All images may be moved after they have been placed up until the 'Finished' button is pressed, the user may start the task again at any time by pressing a 'Reset' button.

The Cool Wall application was developed in Adobe Flash and runs on a Tablet PC (supporting a single point of finger touch input) and is presented in a specially designed 'kiosk' style housing for deployment in schools and public spaces (the three buttons show in Figure 2 left are not used in the Cool Wall application). When the user has dragged an image to a location the associated cool category is determined using its position. When the 'Finished' button is pressed the categories of all images are appended to a log file.

5.2 Populating the Cool Wall

While the design of the cool wall application was uncomplicated the selection of the images to be classified by the users required careful consideration. A list of possible images for the wall was constructed after preliminary discussions with teen informants of what they thought was cool and uncool, this list was then extended after identification of recurring themes from the 'design your life' study described in (Read et al, 2011). A different set of teen informants were then asked to use their camera phones to take pictures of objects, locations, behaviours, etc. they encountered in their environments they considered cool or uncool. Some of these additional images were included in the final cool wall along with a selection of images from the original list (from the early informants and the previous research study) that represented key themes. These themes were:

- Music (bands and artists),
- Fashion (clothes, shops, brands),
- Technologies (mobile devices, latest/most expensive technologies, games consoles),
- Interests (activities, hobbies, preferences)
- Food (fast food, sweets)

In line with the aims of the Cool Wall study, priority was given to items related to the having of cool 'things' (possessions etc), for example images for both BlackBerry phone and iPhone were included separately (as opposed a generic representation of a smartphone). Additionally, the two devices occurred repeatedly in the data from the studies. Themes with a potentially large set of associated images and short temporal relevance, such as music and fashion, were limited for practical reasons (i.e. the

associated length of time taken to complete the Cool Wall classification activity with a large set of images). However, we did include the image of Justin Bieber as we had previously noted that this person divided opinion amongst teenagers and so we wanted to explore this further. The images were selected for visual clarity but were open to some level of interpretation: for example, the picture of a football could be interpreted to mean a football (the object), playing football (the activity), or even supporting a football team. The coverage of the selected images across the six themes is show in Table 2 and the complete set of images is shown later in Table 3.

Theme	Number of Images
Music	1 (4%)
Fashion	3 (12%)
Technologies	5 (19%)
Interests	13 (50%)
Food	4 (15%)

Table 2. Distribution of images using to populate cool wall across themes

The prototype Cool Wall application (as shown in Figure 3) was piloted with a class of 25 Year 7 (age 12) children in a high school in the North West of the UK. The primary aim of this first study was to uncover any serious usability and technical issues in the prototype. We were also keen to gain some initial insights into how the images chosen would be categorised. It was explained to the class by their teacher that they would be taken individually to participate in a short research study, a Tablet PC running the application was setup outside of the classroom. Students completed the cool wall individually with no imposed time limit, a researcher was on hand to explain the task and observe. Appropriate permissions were sought from the school to allow the study to take place and all data collected was anonymous.

The prototype proved reliable and the participants had no issues understanding and interacting with the application. Participants were able to sort the images without tiring or becoming bored. From observations it was noted that in a small number of cases participants placed items on boundaries between categories. In the initial prototype the position of the left hand edge of the image was used to determine the category assigned to an image. The decision was taken to inform users in future studies to place images within single categories (and the application was modified to use the centre position of the image to determine the category). Data collection worked successfully and some general trends were evident (such as mobile technologies being cool) and that some items proved contentious (such as football).

6. The Cool Wall Study

To test the effectiveness of the Cool Wall an extended study was carried out with the target user group. The images with the highest and most variable cool score were then analysed by eight academics, using the cool characteristics discussed in section 4, in order to gain further insights into these results. The prototype Cool Wall kiosk was deployed over the course of two school days in a different High School in the North West of the UK, in a communal area accessible to all students (from Year 7 to year 11, ages 12-15). The area was accessible during morning, afternoon, and lunch breaks on both days. The aim of the study was to utilise the Cool Wall as a tool to gain insights into the shared understanding of cool with a focus on having of cool things. An instruction sheet was fixed next to the device explaining the purpose of the prototype and providing some brief instructions. Students were free to complete the Cool Wall individually or in groups, it was not possible to record information about how many students interacted each time, or whether students were able to interact in privacy. A researcher visited the deployment at intervals to check it was still working correctly although use of the prototype was not observed Appropriate permissions were sought from the school to allow the study to take place, participation was voluntary and data was collected anonymously.

6.1 Cool Wall Study Results

During the deployment, the Cool Wall was completed 125 times, no reliability issues were encountered during the use with either the application or the data collection. In order to analyse the results a weighted scoring mechanism was applied based on the category assigned (seriously uncool scored -2, uncool scored -1, cool scored 1, subzero scored 2). We were interested in identifying the images that gave insights into a shared understanding of cool things (translating into a high mean score, with low standard deviation) and images over which there was disagreement (average mean score, high standard deviation). The complete list of 26 images from the Cool Wall ordered by score are shown in Table 3, the fourth column is the standard deviation of scores from each of the 125 participants.

Rank	Image	Mean Score	Std. Dev.
1		1.47	1.07
2		1.47	1.09
3		1.42	1.22
4		1.21	1.12
5		1.07	1.24
6		0.98	1.22
7		0.78	1.33
8		0.77	1.51
9		0.63	1.45
10		0.47	1.34
11		0.41	1.42
12		0.39	1.46
13		0.17	1.59
14		0.10	1.60
15		0.02	1.36
16		-0.03	1.56
17		-0.14	1.43
18		-0.21	1.69
19		-0.22	1.47
20		-0.23	1.55
21		-0.24	1.36
22		-0.47	1.78
23		-0.57	1.35
24		-0.59	1.52
25		-0.84	1.26
26		-1.47	1.27

Table 3: Images from Cool Wall Prototype order by cool score

As the results in Table 3 show, the top six items with the highest mean cool (positive) scores (between 0.98 and 1.47) were also the six with the smallest standard deviation values (between 1.07 and 1.24). From this we can infer that the overwhelming opinion of the participants in the study is that they are perceived as cool. The first four items are clearly about desirable technology (the top three being related to Apple products) while the fifth and sixth items are related to food. More generally, from any image with a mean > 0 an inference can also be drawn that overall these items contained elements of cool.

The images that divided opinion tended to have a negative or very low cool scores; those with the top five highest standard deviation values (between 1.35 and 1.69) are at positions 22 (Thomas the Tank Engine), 18 (hair straighteners), 14 (a cat), 12 (Nintendo's Mario character) and 16 (the cover art for Activision's Call of Duty 4: Modern Warfare game) with mean cool scores between -0.47 and 0.39.

The result of the study show that desirable items are cool, the coolest items being expensive mobile technologies (which the participants in the study were unlikely to own themselves) followed by food items that would be considered unhealthy by the participant's parents (sweets and fast food). The other images making up the top ten coolest items were of an expensive sports car, a Sony PlayStation 3 console and branded sportswear. The top 10 also includes items from the key themes in Table 2 (technologies, food, interests and fashion).

6.2 Academicians'Results

In order to explore the highest scoring and most contentious images in more detail a further study was carried out. Eight academics independently described their interpretation of the two sets of images along with its place in the hierarchy of cool (as shown in Figure 2) and the cool characteristics (as shown in Table 1) they ascribed to it, results are shown in Tables 4 and 5.

The academics in this study interpreted the meaning of the images correctly and the type of cool associated with the top six images as 'having' was confirmed. The top four images were considered to be in the RICH category of cool, being highly desirable but exclusive due to their high cost. The top five images were considered to be in the AUTH category of cool, belonging to currently fashionable brands. The sixth image, related to fast food, was considered to be in the REB category of cool, displaying an element of rebelliousness (most likely rebelling against the wishes of their parents to eat healthily. Perhaps most interesting are the comments in Table 5 (and Table 4 to a

lesser extent), where potential new categorizations (or sub-categorizations) of cool are proposed relating to belonging to social groups, fitting in with peers, shared identity, and innately desirable objects. Other comments highlight issues that are less related to specific cool categories and may have a more holistic relationship with cool such as trends, fun and lifestyle.

Image	Cool Type	Cool Categories	Comments
1	*Having*	*RICH, AUTH*	*Trendy*
2	*Having*	*RICH, AUTH*	*Trendy*
3	*Having*	*RICH, AUTH*	*Trendy*
4	*Having*	*AUTH, RICH*	*Social Group*
5	*Having*	*AUTH*	*Fun*
6	*Doing, Having*	*REB*	*About hanging out.*

Table 4: Analysis of images with highest cool scores showing place in the Cool Hierarchy (Cool Type), Cool Categorizations (Cool Categories) and comments.

Image	Cool Type	Cool Categories	Comments
22	*Having/ Doing*	*RET*	*Shared childhood experience*
18	*Having*	*AUTH*	*Change appearance to fit in with peers*
14	*Having*	*AUTH*	*Innately desirable for some*
12	*Doing*	*AUTH*	*Membership of community, identity*
10	*Doing*	*REB, ANTI, AUTH*	*Fitting in with peers, shared experience*
20	*Having*	*RET*	*Portrays a lifestyle*

Table 5: Analysis of images with highest standard deviation in scores showing place in the Cool Hierarchy (Cool Type), Cool Categorizations (Cool Categories) and comments.

6.3 Discussion: Understandings of Cool

Before creating the Cool Wall an understanding of cool had been developed, resulting in a set of cool categories (Table 1) and model containing a hierarchy of cool (Figure 2). The Cool Wall was developed in order to explore one particular aspect of this model of cool ('having cool stuff'), which relates objects (primarily possessions). A set of images to populate the Cool Wall were created with input from different groups of teen informants, and a set of themes was used to help categorise and select those to include. After a two-day deployment of the Cool Wall prototype in a school a set of results was produced and analysed in order to rank the coolness of each image. The

top six images were analysed in further detail to explore the cool type and cool categories to which they each belonged and these most cool items proved to be overwhelmingly related to RICH and AUTH. The results indicate that expensive mobile technologies are understood to be cool, and also that certain types of food (sweets and fast food) are also understood to be cool.

The original six categories of Cool might requite some refinement. Retro (RET) might indicate two distinct types; 'unfamiliar' retro that is clearly identifiable as being from a different era (such as the early Volkswagen Camper van and the Banjo) outside of the lifetime of the current teenager, and 'familiar' retro which has fond associations from childhood and provides a shared experiences with peers (such as Thomas the Tank Engine). Retro in general appears to be influenced by age, with older teenagers classifying familiar and unfamiliar retro as cool. For younger teenagers past eras perhaps have strong negative associations with their parents and items from childhood have strong negative associations with being perceived as immature – both factors leading to retro being classified as not cool. The further analysis identified that anti social (AS) also has a further sub-type, while individual activities (such as playing a computer game) are perceived as anti-social with the home they can also contain strong social elements in a more selective way. The computer game shown on the wall (position 16) is typical of current multi-player team-based online games alongside which 'voice chat' is commonly used to communicate with others. The innovative (INN) category featured very little in these studies, indicating that this kind of cool is not relevant or not understood by the teen informants or teen participants in the study.

A new potential new category of cool was mentioned by several different academics when analysing the images in detail, that of a kind of cool that gave membership of a peer group or fostered an identity. This was identified when classifying the BlackBerry phone (supported membership of the exclusive group of BBM users), the hair straighteners (allowed changing of appearance to fit in with peers) and football (gave an identity as one who played football or supported a specific team, also supported membership of the general community of those interested in football). Another potential classifications included 'trendy' (i.e. currently fashionable), which could be further broken down into the existing categories of RICH, INN and even AUTH.

7. Refining the Cool Wall Methodology

The cool wall proved successful as a tool to explore insights into cool preferences in a low-cost manner, and showed shared understanding of the 'having cool stuff' category

of cool as intended. However, two potential weaknesses in the Cool Wall as a survey tool are the coverage given by set of images used and the interpretation of the images by participants. To investigate these two potential limitations, two further studies were indicated. These are described in the following sections.

7.1 The Paper Cool Wall Study

For the original study, the size of the set of images used to populate the Cool Wall was restricted and the images were chosen based on the aims of the research. This follow on study aimed to gain insights into what teenagers would choose to populate a cool wall with if they were given free choice, with a focus on the items identified as cool. The study was carried out with two classes within the same high school in the North West of the UK where the Cool Wall ha been previously deployed for two days. The study involved a class of 16 year 7 children, and a class of 8 year 10 children, both classes had previously worked with the research team. The studies were each carried out during a 50-minute class, each with the same research team and class teacher present. The Cool Wall concept was re-introduced and explained to the students as being a way of helping the researchers to understand the likes and dislikes of the class. The tasks that were to be completed by the students were explained, the research team being careful not to mention that it was not cool per-se that they were trying to understand.

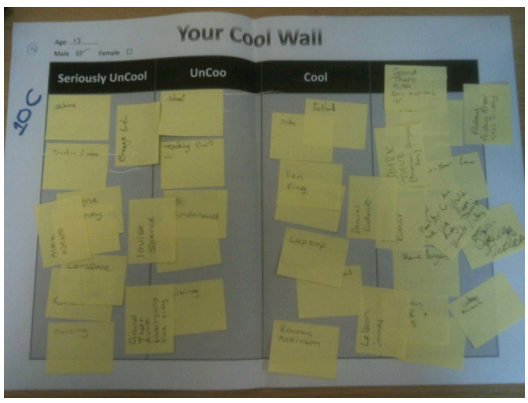

Figure 3. Completed Paper Cool Wall

The participants were asked to first complete the Cool Wall in small groups (of 2-3 participants, groups were organised by the participants themselves) and then given an A3 size unpopulated paper version of the cool wall together with pads of small Post-it notes and asked to populate it with whatever they liked. Participants were told to write on the Post-it notes and were encouraged to consider all four categories. The

researchers observed the tasks being completed, offering guidance when necessary and occasionally asking questions to help understand the decisions made in the groups. A populated paper cool wall is shown in Figure 3.

7.1.1 Analysis

Thematic analysis of the items considered cool (i.e. placed in the Cool (C) or Sub Zero (SZ) category) for both age groups showed seven key themes:

- Music e.g. The Wanted (C,SZ), Justin Bieber (SU),
- Fashion e.g. Hollister (SZ) Skinny Jeans (C),
- Technologies e.g. iPod (SZ), Xbox 360 (SZ),
- Interests e.g. Chillin' with friends (C), Hiking (SU)
- Food e.g. KFC (SZ), Chocolate (SZ)
- Television/Film e.g. Family Guy (SZ), Harry Potter (C)
- Human Characteristics e.g. One Beautiful Man (SZ), Cockney Accent (SZ)

The coverage of these images across these themes is shown in Table 6. Compared with the themes in section 5.2, identified when populating the cool wall, two additional themes are evident (TV/Film and Human Characteristics). While these themes are not of direct importance to the aims of the Cool Wall study carried out in this work they are liable to provide interesting insights into the preferences and peer groups to which participants belong. The theme Human Characteristics included some gendered and sexual themes from both the Year 7 and Year 10 participants.

Theme	Year 7	Year 10	Total
Music	*7*	*5*	*12 (9%)*
Fashion	*9*	*4*	*13 (10%)*
Technologies	*9*	*4*	*13 (10%)*
Interests	*28*	*17*	*45 (36%)*
Food	*8*	*2*	*10 (8%)*
TV/Film	*7*	*12*	*19 (15%)*
Human Characteristics	*4*	*9*	*13 (10%)*

Table 6: Results from Paper Cool Wall study in Cool and Sub Zero Categories

7.1.2 Results

Comparison of the coverage of the themes between Table 2 (in section 5.2) and Table 6 shows similarities, with the highest proportion relating to interests. Accepting the missing two categories, this indicates that the initial images chosen for the cool wall do provide good coverage within a relatively small number of images; the cool wall

contains 26 images while the Year 7 group alone populated their cool walls with 125 unique ideas.

In addition to understanding the cool items we identified items that had been categorised as being cool and not cool. This only occurred in three cases, fish were categorised as Cool and Uncool (both within the year 7 group). Golf was considered Cool in the year 10 group but Seriously Uncool in the Year 7 group. Nike was considered Cool in the Year 7 group but Seriously Uncool in the Year 10 group. These three items clearly require further investigation.

7.2 Understanding Cool Images Study

The success of the Cool Wall as a tool to provide insights into the understanding of cool relies on having the right selection of images but also on correctly understanding what the images convey. Trade-offs and choices were made in creating images for the cool wall and while the meaning for each is clear for the research team it was conceded that this might not have been clear for the teenagers. A study was designed to understand how teenagers interpreted the original set of Cool Wall images. In this study each image from the Cool Wall was shown and the participants simply wrote down, in free text, how they interpreted the image. This study was carried out with a class of 16 Year 7 pupils in a High School in the North West of the UK (that had not previously worked with the research team). The study was introduced with an explanation of its purpose, and along with some brief background on the research project with which it was associated. The researcher made clear that the participants should try to avoid simply recording what the picture showed and attempt to write down a word or short phrase that captured what it meant to them. Each image was shown for 20 seconds.

7.2.1 Analysis

The teenage participants interpreted the majority of the images as expected, often recording what the picture showed in addition to giving their own personal meaning e.g. ‘Chess: Boring!!!’, ‘Call of Duty – Boys Game – Boring’, ‘football – Manchester United’. Four images in particular had unexpected interpretations, image 1 (as shown in table 3; the ‘Adidas’ logo, chosen as a brand that may divide opinion among teenagers) was identified as relating to desirable sportswear but primary association with football for 4 of the male participants. Image 10 (3 people running on treadmills, chosen to symbolise exercise) was primarily identified as ‘gym’ and/or ‘fitness’ but also related to

'girls' for 3 of the male participants. The graphic shown in image 15 (chosen to represent sustainable issues and behaviours) was most often interpreted as referring to recycling, but also interpreted as related to 'global warming' (by 2 participants) 'Green Week' (by 1 participant) and 'environment' (by 1 participant). Image 20 (the early Volkswagen 'camper' van, chosen to represent 'retro' items from different eras) received the most diverse range of interpretations, including holidays (by 2 participants), a cartoon in which a similar vehicle appears (by 2 participants), the traveller community (by 3 participants) and 'hippies' (by 4 participants).

7.2.2 Results

The results from this study, particularly those of the four with unexpected interpretations, open up the question of whether images should be used in isolation without descriptions to help the participants better understand what they are trying to portray.

As Adidas is a well-known maker of sportswear in the UK this may inherently cause additional associations. A teenager who is heavily into football may relate Adidas to football due to them manufacturing the kit of their favourite team or sponsoring them. A teenager who is into tennis or rugby may make similar associations; teenagers are known to focus on what they know and taking a more egocentric view on the world, similar to that of young children.

Image 10 predominantly shows 3 women (and one man in the background) doing exercise so it is understandable that pre-pubescent or immature teenagers may focus on the look of the people in the picture rather than focussing on the image provided in the context it is meant. The issue of physical attributes, particularly of the opposite sex, was apparent in Study 2 highlighting the prominence of this construct in teenagers of this age.

Image 15 was most referred to as recycling which is perhaps expected as this is similar to the image found on recycling receptacles and aluminium drink cans. It is possible that teenagers relate this image to whatever 'green' topic they can recall most easily, whether that be from what they have heard or read in the news to a topic they are studying at school.

The VW Campervan is perhaps the most interesting as it does give support to the argument that teenagers associate images with activities (such as Adidas representing football) with the inclusion of holidays in their answers. The choice to associate them with the traveller community is perhaps most unexpected. It is interesting to note that

around the time of this study the closure of a traveller camp in the UK was prominent in the news and this, and images shown around this story, could have influenced these choices.

7.3 Discussion

The key challenges to using this approach are mainly focussed on the population of the wall with the correct images that can be interpreted with minimal ambiguity. This is a particularly challenging task and as shown does require thorough testing. Cultural differences will play a part in the use of the Cool Wall and these could vary between local differences in towns for example, to national differences between countries. Previous research by the authors has identified issues using images with younger children such as using a specific technology to represent a technology group as a whole can lead to inconsistent answers (Horton and Read, 2008). An example of this is children being asked (using pictures) if they have a games console at home and choosing the answer no because the picture is of an Xbox when they in fact own a PlayStation.

8. Concluding Remarks

The Cool Wall was developed as a low-cost tool designed to provide insights into what teenagers do, and do not, find cool through categorising a predefined set of images. It was used to explore the authors' initial theoretical understanding of cool and provide specific insights into cool possessions ('having cool stuff'). The tool was developed using a heavily participatory approach, where groups of teen informants contributed ideas and insights during the selection of the image set, and participated in all the studies. Running a cool wall study over two days in a school provided results showing a shared understanding of expensive branded mobile technologies being the most cool possessions for the participants, the next coolest item being food (sweets and fast-food). These results were analysed in further detail using initial understandings of cool using a model and categorisation. Analysis enabled refinement of categories of cool that already been identified and highlighted a potential new category relating to membership of a peer group or fostering an identity due to shared likes and dislikes. Two potential limitation of using the Cool Wall as a survey tool were also explored; the challenge of selecting appropriate images and potential ambiguities

in interpretation of the images. These studies identified new themes that may be used when selecting images to populate a cool wall and identified challenges for child user interpreting the meaning of images.

The development of the Cool Wall has allowed us to better understand and unpick the characteristics of cool in relation to objects (the 'cool stuff' layer of the cool hierarchy has partially guided this work). It allowed us insights into the lives of current teenagers and their shared views on what is cool, which we can now explore in detail using more qualitative techniques. The next challenge is to further understand what makes objects cool objects cool and how designers can learn from this; to determine, for example, what specific properties and attributes of an object have associations with cool and how coolness is shaped by the relationship between a community/individual and the object. Ongoing work by the authors is exploring the other facets of cool identified in this work (doing and being cool) and further studies in the context of the Cool Wall will be used to see how well the tool works with specific research questions in mind, for example finding out which functions are considered cool in a mobile phone.

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