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How do Children and Adults make Inferences about Ownership?

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PhD

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How do Children and Adults make Inferences about Ownership?

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the requirements of the University of
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ABSTRACT

In everyday life both adults and children are faced with the problem of judging who owns an object. Past research has indicated that adults and children may base their decisions on who was seen possessing an object first (the first possessor bias) or the person with whom an initial visual association was created.. The current thesis aimed to investigate this, and ascertain whether children and adults maintain their bias to choose the first possessor of an object as its owner when other competing information regarding ownership is available. Chapters 2 and 3 used between subjects factorial designs in which adults (aged 18 - 60) and children (aged 3 - 4 years) viewed a number of stories of characters possessing objects in a variety of different scenarios. After viewing each story participants were required to judge which character owned the object. Results showed that when adults and children had no information, other than who possessed an object first, they chose the first possessor as the owner of the object. However when other competing information, such as the gender or age stereotype of the object, or who had constructive possession of the object, was available both adults and children disregarded their first possessor bias and made decisions in line with this other information. Chapter 4 used a between subjects factorial design and a mixed factorial design. The aim of the experiments was to ascertain whether adults and children take the history of an object into account when deciding who owns an object. Adults (aged 18 - 60) and children (aged 3 – 4 years) were shown stories in which one character wore and object and another character held an object. Information was given to help participants infer the history of each of the objects in the stories. Following each story participants were asked to judge who owned the object. Results demonstrated that both adults and children take

the history of an object into account in their ownership decisions, and privilege this information above other competing information such as visual association, but that adults do this more reliably than children. All the experiments in this thesis demonstrated that when there is no other information available both adults and children base their decisions on who was seen possessing an object first. However when other information is available both adults and children take this into account in their decisions. Adults and children may use the information in order to reconstruct the history of an object to ascertain who had contact with it in the past and therefore who may have a legitimate claim of ownership over it.

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AUTHORS DECLARATION

The findings from chapter 2 have been published in a peer reviewed journal

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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 and granted by the Northumbria University School of Life Sciences Ethics Committee on October 2008.

Name:

Signature:

Date:

Chapter 1: Introduction

Property norms are ubiquitous and regulate our behaviour, with almost everywhere we go and everything we do on a daily basis including a calculation of ownership rights, be it fleeting or even unconscious (Rudmin, 1991). Ownership is involved when we buy, sell, lend, give, receive, find, lose, donate and steal, while also affecting our behaviour, and the behaviour of others, in a number of different ways. Ownership decisions involve a myriad of different facets such as, who can own, what can be owned, and what rights ownership affords. People can also draw inferences about how ownership can be transferred and relinquished, as well as how something comes to be owned in the first place.

Ownership also constrains our behaviour towards objects which do not belong to us. For example, unless John owns a book he is unlikely to pick it up and write in it, without seeking permission from the person to whom it belongs. Similarly, John will not expect a stranger to try and take his book without seeking permission first. This is because ownership affords an owner with exclusive rights. Within the confines of the law an owner has the right to control their possessions however they like. This could include using them, transferring them or even destroying them. They also have the right to control how others use them, and even exclude them altogether (Snare, 1972; Claeys, 2009; Blumenthal, 2010). These rights also bring with them moral responsibility. Owners are responsible for their property and how it affects others. Controlling access to their property may make people aware of the needs and welfare of others, leading them to share or donate property, rather than excluding others from it. An owner is free to use their property as they wish, but they should not use it to cause harm to other people (Locke, cited in Epstein, 1985).

Ownership also affects social behaviour. An understanding of ownership rules allows us to predict other people's behaviour and plan our own. For example we can assume that if we leave our coat on the back of a chair in a restaurant someone will not take the coat, or the chair, while we are away from it. A grasp of, and adherence to, ownership rules also affects how we are viewed, and how others react toward us in society. For example, suppose Luke attempts to steal Jane's car. Those who are aware of who the car's true owner is will most likely act on her behalf and attempt to stop this from happening. Furthermore Luke will then be viewed negatively by those people for attempting to violate Jane's ownership rights. Ownership is also mediated by social relationships. For example if Emma owns a book, society would dictate that non owners do not have access to this property unless given permission. In society it is common practice to allow friends to share ones property, therefore, if a friend asked to borrow the book Emma would most likely oblige, as to refuse may cause an awkward situation between them. However to deny a stranger permission would not result in the same outcome, as it is accepted that owners rarely allow strangers any rights to their property. Failing to respect the ownership rights of others will inevitably result in conflicts, and more seriously, social exclusion.

There are a number of important questions that can be asked about ownership, some aspects of which have been mentioned above. In this chapter I first review legal and philosophical theories of ownership, and discuss how these theories address a variety of questions about ownership. First I examine the questions of what property is and what rights are associated with it. I then move on to consider the social aspect of property, and review theories of psychological ownership. After a review of the theory I move onto experimental studies on ownership, and discuss how these studies have addressed the legal theories. Finally I consider three theoretical accounts which attempt to explain how adults and children infer object ownership.

1.1 What is Property?

It is obvious that the ownership of property affects everyone, and may have serious consequences for those who fail to respect the rights of others. However, one question which must be considered is: what can someone own and have rights to, or in essence, what is property? The word property may lead people to consider “real” property such as land or houses, perhaps stretching further to other tangible objects such as cars or furniture. However whilst property can refer to the physical objects listed above, it can also include space, resources, and in some cultures living entities such as people. It can also encompass more abstract concepts such as songs, stories and ideas, copyrights, patents, trademarks and even trade secrets. This is known as intellectual property, and differs from physical property. For example, I may own a book written by Lee Child – that is, I own the physical book – but he has a copyright on its contents. I have the power to exert my physical property rights, such as controlling who is allowed to read or borrow my book etc. but I do not have the right to reproduce the book, and give these copies to my friends. Whilst I may own a particular physical copy of the book, and enjoy the rights that this affords me, these rights are separate from the intellectual property rights of the book, which belong to the author.

1.2 Private, Common and Public Property

A distinction needs to be made between the different types of property that exist. When asked to consider what property is many lay people will most likely refer to private property, but property also includes common property and public property. Many legal scholars claim it is difficult to accurately define private property. It may be

said to exist when a single individual, or groups of individuals, have certain rights with respect to resources such as land, houses or smaller items such as cars and personal belongings (Merrill 1998). These people have the right to use and manage the property they own as they please, and have largely unrestricted rights to the income or the capital from what they own. Owners of private property also have the right to bestow what they own, or any part of it, on whomever they please.

Common property differs from private property in that no one person has the ability to control the property and all the rights it affords. "Common property may be said to exist where all qualified members of a particular group or community have equal rights to valuable resources" (Merrill, 1998, p.733). In common ownership people can possess and manage property. However they do not have sole control of it. The community as a whole, should they so desire, can exercise their right to rule on how the property is used, or even to redistribute the property. When property is in common ownership people are accountable to their fellow citizens, and are prevented from making sole decisions. Examples of common property may include common pasture open to all members of the public for grazing their animals.

Public property exists when the government rather than individuals or communities have certain rights and interests with respect to valuable resources (Merrill, 1998). It is up to the government who is allowed to use these resources and who is excluded from these privileges. These rights are similar to the rights private ownership affords to individuals, but public property is available to the entire public for use. Examples of public property may include public parks and airports.

1.3 Defining Private Property

Differences arise between what lay people would refer to as property in contrast to the legal definitions of it. According to Blumenthal (2010) lay people commonly attribute an absolutist conception of property, placing importance on a person's sense of power or dominion over "his" things. Claeys (2009) agrees with this adding that, to a lay person, property is a discrete thing over which an owner has an absolute right to do with what it he will. For lay people property is a simple concept involving a person and their, often tangible, thing or things. For legal scholars property is a much more complicated concept. There is no coherent and agreed upon definition of property among legal scholars. Some put forward more vague ideas about property, claiming it is anything that can be used to provide some kind of value (DeLong, 1997). Others claim that property is created when an individual or group can justify their use of, and or restrict access to, a valued resource, (Demsetz, 1967). For most legal scholars however property is not just an owned item, but also a set of ownership rights that are intrinsically linked to this item, and can be invoked in relation to it. Demsetz (1967) points out that often a bundle of rights attaches to the physical article, or what lay people would refer to as "property." For legal scholars it is the value of these rights that is important, rather than the actual item itself. In fact according to some, it is not until these ownership rights are invoked that something goes from being merely an object to being property. According to Merrill (1998) a rare book in a shop may be a scarce resource, but sitting on the shelf this book is considered an object and not property. The book only becomes property when certain rights, which are attached to it, are invoked. If the book belongs to the shop then this means that the bookshop has certain rights with respect to controlling it. If a person

buys the book from the shop this person becomes the owner and then obtains the rights which come with the book.

1.4 Property Rights

It is clear then that whilst lay people may define property solely as a physical item, legal scholars seem more interested in the ownership rights which are attached to an item, and which are necessary for any item to be considered property. Blumenthal (2010) puts forward some examples of what he considers are the ownership rights attached to an article, "For instance the right to possess, use, derive income or profit from, transfer, sell, give, bequeath, manage or even destroy one's property" (Blumenthal, 2010, p187). Snare (1972) claims there are three basic rules or rights of property. The owner is (1) allowed to possess and use the object, (2) may exclude others from possessing or using it and (3) may choose to transfer rights in the object to another person. The issue over which legal scholars are divided is which right is the most important property right? Some claim the right to exclude others is the most important right in the bundle. Merrill (1998) cites William Blackstone's view of the most important property right,

There is nothing which so generally strikes the imagination and engages the affections of mankind, as the right of property; or that sole and despotic dominion which one man claims and exercises over the external things of the world, in total exclusion of the rights of any other individual in the universe. (p.734).

Merrill (1998), who also views the right of exclusion as the core attribute of property, claims this quote demonstrates that exclusion is not only a necessary, but also a sufficient, condition of property. He attests that intellectual property provides an even more striking example of this, explaining how the intangible rights which

intellectual property affords the owner are, at their core, the right to exclude others or prevent them from using the property rights in specified ways. For example, a trade secret by definition is only a property interest so long as it remains secret, and others are excluded from this privileged information. As soon as others learn the secret, the holder has lost his property interest. The U.S. Supreme Court echoes the importance of the exclusion right, describing it as a fundamental element of the property right, and one of the most essential and treasured rights of property. However other scholars maintain that whilst the right to exclude may be a necessary condition of property, the ownership rights one has in one's property include more than just this right. Epstein (1985) is one of these scholars, claiming that possession, use and disposition lie at the core of a comprehensive and coherent idea of ownership. Epstein claims that the right way to think about these elements of property is to ask what ownership would mean if any of these elements were removed. Whilst the right to exclude may be an important property right Epstein's view explains why it is not the only right of property that is important. A further quote from Blackstone (cited in Claeys, 2009, p.15.) emphasises that whilst the right to exclude may be a necessary condition of property, in contrast to Merrill's opinion, it is not a sufficient condition and other rights are important, "Property.....which consists in the free use, enjoyment, and disposal of all his acquisitions, without any control or diminution, save only by the laws of the land."

Dorfman (2010) both agrees and disagrees with Epstein's (1985) outlook. Whilst he agrees that the right to exclude is not a sufficient condition of property, he does not believe that the right to possess and use fully represent what property is. The explanation he puts forward in relation to the rights that constitute property encapsulates both the "right to exclude others" and the "right to possess and use," stating that these rights are seemingly inseparable, and each "right" by definition

includes the other. He purports that the “right to use” a thing requires the “right to exclude” others from the thing and the “right to exclude others” presupposes a “right to use.” He concludes by saying that property is not just the right to use, or the right to exclude others, but that the most important property right the owner has is the “right to exclusive use.” Claeys’ views (2009) echoes this sentiment. He agrees that property and ownership cannot be reduced to an owner’s rights to exclude others from his “thing,” but even more important is the right of the owner to determine exclusively how a thing can be used. Claeys claims that exclusion is not necessary to property, it is merely a feature of it. He further argues that those who interpret Blackstone’s quote in a similar way to Merrill (1998) are misinterpreting the owner’s “exclusion” rights. According to Claeys (2009), when Blackstone talks of excluding others he is referring not to excluding others from a “thing” but of excluding others from the dominion over the “thing’s” use, which is in essence the “right of exclusive use.” According to this line of thought, the notion that ownership is essentially the right to the exclusive use of an object implies that non owners have a duty to keep off objects owned by others, and thus indirectly to sustain use by owners.

Whether the right to exclude or the right of exclusive use is the most important stick in the property rights bundle will continue to be a subject of debate. However, an important distinction made in legal literature is the difference between possessory rights and ownership rights in relation to property. Property for Merrill (1998) means something different than merely possessing an object. If someone enters a bookshop, takes a book from the shelf and begins to read it, this person would be deemed the possessor, but until this person pays for the book and obtains the ownership rights that come with it, the book is still considered to be the property of the bookshop, and their rights would generally trump the possessory rights of the customer. According to Holmes, (1877) the facts constituting possession generate rights as much as the facts

which constitute ownership. The difference is that the rights of a mere possessor are less extensive than those of an owner. Holmes (1881) provides an insight which may parsimoniously explain the difference between the two. He states that the owner is allowed to exclude all others from using the property, and is accountable to no one in relation to the way property is used. Whilst the possessor has these rights in relation to others he is accountable to the owner of the object in regards to the actions he takes with respect to the property.

The questions of what constitutes property, which property right is the most important and what the real difference between possession and ownership is, will perhaps never receive unanimous answers. However Merrill (1998 p 733) puts forward a summary of what he believes is a general consensus of property,

Property refers to particular rights of persons or entities with respect to scarce tangible and intangible resources; property is distinct from, and superior to, the mere possession of resources; that the rights associated with property require some institutional structure that stands ready to enforce these rights; and that property may be private, common or public.

1.5 How is Ownership Established in Society?

According to Rudmin (1991) the social perception of ownership has so much consensus, and is so well socialized, that most people go to court rarely, and if they do it is often because of a wilful rebellion against the whole property regime, rather than a misinterpretation of a property right. We know where our ownership rights reside, and where they do not. Berkeley (1963) notes that the institution of property is relatively invisible, but disputes are infrequent because we all see with the same eye. The question then is how do we discern ownership in such a successful way that our daily lives are not littered with property conflicts?

A number of different theories have been proposed as to how ownership is established, both in law and among lay people. One theory put forward is that the original owner got the title through consent of the rest of humanity, who all together were the recipients from God (Grotius, 1814). An obvious issue with this account is the logistical problem of getting everyone together to make decisions on how things should be divided between people. When viewed in light of this it seems nonsensical to think ownership is established in this way. John Locke (reported in Rose, 1985) observed the problems in this account of ownership and put forward a different theory, one where an original owner is one who mixes his or her labour with the thing. By doing so this person establishes ownership of the thing. Whilst it may make sense that someone who has invested time and effort into a thing should have a claim to it, there are problems with this account. Epstein (1978) refers to the Pierson v Post case, (1805) to illustrate one of the issues. Post was hunting a fox. Pierson saw this, joined in and killed the fox. In this case both men had mixed their labour with the thing, Post in the original hunt, and Pierson in the capture and killing of the fox, yet one of these men will inevitably have their labour unrewarded as only one man can own the fox. If some labour is not constitutive of ownership then undoubtedly other factors must come into play when establishing ownership. Epstein (1978) also points out that in some cases the labour theory is irrelevant in establishing ownership. People may come to own things not because they invested their labour in them but through good fortune, or even by chance. The person is still afforded with ownership of them despite the fact no labour was involved in acquiring the things, or indeed in cultivating them. Finally Epstein argues that in order to perform the labour, which is required to determine a claim of ownership, it is usual to establish a right against all other people to do it. If this right is not given, the invested labour, deemed by some to demonstrate a claim of ownership, is in fact nothing more than forcing one's self upon

someone else, with neither their invitation nor their permission. In this way the labour theory cannot explain how original ownership is entitled as without a prior right to invest the labour a person should not be interfering with the object in the first place. At best labour may result in an entitlement of payment for the labour, but not a claim of ownership.

1.6 The Role of First Possession

An approach which presents perhaps a more robust theory is the common law approach, in which possession is the origin of property (Rose, 1985). According to Rose first possession is the root of title. This is also supported by Lueck (1995) who notes that first possession rules are the dominant method of initially establishing property rights. In short those who gain control of something before anyone else, have a legitimate ownership claim over it. Epstein (1978) also provides some support for this viewpoint, summarising the verdict from the *Pierson v Post* case (1805); that the only proper way of obtaining ownership of things not previously owned is to take possession of them, and to do this before anyone else. Epstein (1985) notes that first possession is a simple and universal rule of conduct, and one which operates as the source of individual rights, which are good against the rest of the world. Epstein states that obtaining possession often requires an expenditure of resources, and expending these resources makes clear the exclusivity of ownership. Stake (2004) acknowledges possession may be key to establishing ownership, but what is difficult to ascertain, and what formed the basis of the *Pierson v Post* case (1805), was what exactly it takes to establish possession. According to Stake (2004) the law breaks possession into two elements: physical control, or possession, and intent to assert control.

First possession has been the deciding factor in many legal disputes and takes precedence over any rights the pursuer may have. In the aforementioned *Pierson v Post* case (1805), despite the fact Post had been pursuing the fox much longer than Pierson, the fox was deemed to belong to Pierson as he was the first to take possession of it. Similarly, among Eskimo hunters in the Ammassalik, if a seal escapes with a harpoon in its head the hunter who eventually captures it takes ownership of the seal, but must return the harpoon to its owner, (Hoebel, 1954). Lueck (1995) also notes the first possession rule can grant ownership of a barrel of crude oil to the first person to bring it to the surface, and similarly can grant ownership of the entire reservoir to the first successful driller. He observes that throughout history the first possession rule has governed ownership of land under the English common law, the African law and the Islamic law. The law of first possession is also upheld in intellectual property law with Lueck (1995) again noting that in the major areas such as copyrights, patents and trademarks the rule of first possession establishes rights in all of these areas. In order to obtain copyright protection a work must be original. The holder of the copyright is then by definition the original owner and the first possessor.

From the above evidence it is clear the weight that is put on first possession when making ownership decisions. Epstein (1978, p.1241) says this of the rule of first possession, "In essence the first possession rule has been the organising principle of most social institutions and the heavy burden of persuasion lies upon those who wish to displace it." Empirical evidence examining the role of first possession in the ownership judgments of both adults and children will be discussed in detail in a later part of this chapter.

1.7 The Importance of Expressing Intent

Whilst first possession is generally accepted by legal scholars as representing a definitive claim of ownership it is not, in itself, enough to unequivocally lay claim to something. Holmes (1877) established that first possession and intent are important but must be made explicitly apparent to constitute ownership. Rose (1985) later supported this pointing out there must be the intent to own, and this intent must be made known to the world through a clear act.

The case of *Parker v British Airways Board* (1982) demonstrates the importance of declaring an intention to own. Mr Parker found a bracelet in the executive lounge at Heathrow Airport, operated by the British Airways Board. He handed this bracelet to the staff asking for it to be returned if the owner did not come to collect it. The Board did not return it to Mr Parker but instead sold it and kept the profits. When Mr Parker later sued the Board his claim was successful as he had possession of the bracelet and had declared his intention to own it. In contrast the Board were deemed not to have prior possession of the bracelet, despite the fact they owned the lounge, because they had manifested no clear intention to exercise control over the premises or the things that might be found therein.

There is also empirical evidence highlighting the importance of expressing intent in claims of ownership (Palamar, Le & Friedman, 2012). In their studies the authors were testing attributions of responsibility, which are affected by factors such as intent. In the first experiment adults read stories about two male characters who were arguing over ownership of a natural, non-owned object. In the story one of the characters made possession of the object possible and the other character physically possessed the object first. The characters then argued over who owned the object. The intent of the character was different across conditions. In one condition the

character intended to obtain the object, and controlled the events leading to making possession of the object possible. In another condition the character made possession of the object possible without knowing about its presence, and without controlling the events which led to its possession. Results from the first experiment demonstrated that the character who made possession of the object possible was most strongly supported as its owner when he had both the intention to obtain the object, and controlled whether or not this happened. Results also showed that the character was supported as the owner more strongly when he had the intent to obtain the object, but lacked the control, than when he had no intention of obtaining the object, but controlled the events making possession possible.

In a further experiment Palamar, Le & Friedman (2012) tested how adults viewed foreseen side-effects when reasoning about ownership. In this experiment adults read stories of a character called Mike cutting down a tree which caused a pineapple to fall to the ground. Dave, the other character possesses the pineapple first and the two characters then argue over who owns it. The stories differed in the intention of Mike in cutting down the tree. In one scenario Mike cut down the tree to obtain the pineapple, and in the other he cut down the tree for wood and with no care for the pineapple. Results showed that Mike was supported as the owner of the object more often when he intended to get the pineapple, rather than when he knew, but did not care about the pineapple. Results showed that claims of ownership from a character are discounted when the outcome is a foreseen, but unintended side effect of their action.

The results from these studies demonstrate that in lay terms ownership judgments are not always based on first possession, as the first character possessing the objects in these scenarios was not always deemed to be the owner. What they also demonstrate is that in order for an ownership claim to be successful, there must

be a demonstration of the intent to possess and own an object. If an agent secures an object without an intention to own it, or foresees that particular actions will make ownership of an object possible, but does not specifically intend to own it their claim of ownership is discounted. Intention, and declaring one's intention, is a vital aspect of a claim of ownership over something.

Economists also give reasons as to why clear communication of ownership is important. If I am careless about declaring my ownership of something I may allow others to incorrectly assume something is theirs. This may lead them to waste their time and effort on it, when in fact they have no ownership claim to it whatsoever. Poor communication of what I own also leads to confusion, which encourages conflict and could even lead to litigation, both of which are a waste of time and energy. If I make clear to others what I own and they think they can make better use of one or more of these things they know they need to deal with me directly. Having clear communication encourages trading rather than conflict and should result in items coming to be owned by those people who value them most and can make the best use of them (Landes & Posner, 1996).

Another reason why it is important to declare what one owns is to prevent others from taking ownership of it through, for example, adverse possession. Adverse possession refers to the practice by which a person can acquire the title to another's property without compensation to the owner. This is accomplished by holding the property in a manner that conflicts with the true owner's rights for a specified period. The squatter must show that during this specified period he had not only exclusive physical control but also the intent to maintain it, whilst also demonstrating that the owner was out of possession. If the original owner makes their claim known publicly within the specified time, the adverse possessor is required to vacate the property and ownership remains with the original owner. However, if the original owner fails to

restate their claim the law treats the property as abandoned and awards ownership to the adverse possessor, as the first possessor of the abandoned property (Lueck, 1995). The new owner is then required to make their ownership known to the world through a clear act.

Rose (1985) points out that the aforementioned useful labour theory may indeed be an important aspect of any ownership claim but in a different way to the one put forward by Locke (cited in Rose, 1985). She claims that the useful labour is the very act of speaking clearly and distinctly about one's claims to property in a language that is understood. Rose (1985) gives a concise account of declaring ownership, and the risks of hesitating in doing so. She defines possession as amounting to yelling loudly enough to all who may be interested "this is mine" in a way the public hears, and the law will protect against someone else who may attempt to claim ownership. If the original owner dallies too long and allows the public to believe the imposter, he will find all too soon that the trespasser has stepped into his shoes and become the owner. Thus it seems that in law first possession is constitutive of ownership as long as the correct procedures for declaring this ownership are adhered to.

1.8 The Social Aspect of Ownership

According to Lueck (1995) first possession is a central feature of property law. Beyond the law first possession is such a central feature of social institutions that it is taken for granted by the people within them. Whilst first possession, as a way of establishing ownership, might be taken for granted, this should not overshadow the importance of society in upholding the established ownership rights. Indeed, in order for ownership to exist in a society, the rules which define it must be acknowledged by

the members of that society. If the members refuse to acknowledge the same set of ownership rules, ownership will make no sense at all.

Searle (1995) describes ownership as an institutional fact. This is a feature of the world that exists only through social convention. According to Searle (1995) institutional facts are the opposite of brute facts. A brute fact is a feature of reality that exists regardless of whether people recognise it or not. The colour of someone's skin is a brute fact. In contrast institutional facts are observer relative, and are only true if people invent them. For example, something is only money because of the way people treat it. Institutional facts are stipulations or practices adopted by some community. Ownership is also referred to by Snare (1972) as a set of normative relations. This set of normative relations can be referred to as a "status," and ownership is an abstract status of entitlement. The critical characteristic of status, according to Kalish (2005), is that there are no physical or psychological properties of it; ownership itself is invisible. The implications of status are prescriptive and prescriptive only. To have the status of owner is to have a particular set of rights and duties, but both statuses and institutional facts have only normative force. They themselves have no direct causal powers. It is only because people recognize and respond to status that it can have any causal implications (Kalish, 2005). The consequences of ownership therefore depend on people knowing and choosing to act on the status.

Rose (1985) notes how this reflects on ownership of property. She observes that whilst it is important to make clear what you own through an act or statement, for this to have any force some relevant world must not only understand the claim but also take it seriously. It is only through the social institution of property that possessions and expectations can be secured, and the cognitive costs decreased.

Only when potential possessors have common perceptions and agreements of who owns what, are possessions and ownership rights secure (Rudmin, 1991).

According to this line of thinking if society chooses to disregard the rights governing ownership then ownership itself no longer exists, as it is only such whilst the whole of society give it a status by choosing to respect the rights it affords. Bentham's (1914) view is similar to Searle's (1995). He claims that property, and therefore ownership, only exists because there are laws in place granting rights to owners, which are in turn respected by those in society. "There is no such thing as natural property: it is entirely a creature of the law..... Before the law property did not exist; take away the laws and property will be no more" (Bentham, 1914, p.145).

The above views of property and ownership rights in society reflect the belief that ownership is a social relationship rather than a private one. Stake (2004) however puts forward a different view of ownership. He proposes that Searle's (1995) explanation of it, as merely an institutional fact, ignores the possibility that there may be fundamental principles of property which are encoded in the human brain. This belief comes from the evidence which suggests that animals are equipped with a system for allocating rights, which is hardwired into their brain. This system works to prevent them entering into competitions for resources which they know they cannot win, due to, for example, size differences between themselves and their rivals. Stake believes humans may share a core property "instinct" which has adapted to deal with the issues we encounter daily in relation to resources. According to Stake, if a body is equipped with rules of property which incorporate evolutionary strategies, such as the one mentioned previously, it is more likely to survive in the world. In this way property and ownership rights are part of human biology. Property and ownership rights do not exist merely because society chooses to respect them but because we as humans possess an instinct for property. Stake does not ignore the role of society in upholding

the rights of ownership, rather it seems rather that he is putting forward the idea that we are equipped with an ability to recognize specific conventions and adhere to them when required. He suggests that, “A property instinct could combine a general inclination to acquire rules with some specific pre-wired options” (Stake, 2004, p. 1764). The human brain may have an inclination to gather examples of resource allocation as a result of the property instinct. Humans then generalize from these examples to one of the available property rules, upheld by society. Stake acknowledges the four elements which he claims the human institution of property incorporates. Amongst these four elements is the importance of other conspecifics honouring or respecting the owner’s relationship with the thing, the owner’s recognition of this respect, and the willingness of the other conspecifics to intervene on behalf of the owner to protect their property from threats by challengers. Those in society must recognise the institution of ownership and uphold the rules pertaining to it.

Stake’s (2004) view of property seems to provide a more comprehensive account of how ownership is established in society. Rather than ownership being an institutional fact, merely a construct of the law, and only existing whilst those in society choose to respect the rights of it, Stake’s view seems to suggest that the human brain’s desire for property may actually aid in developing ownership rights and upholding these in society. For example Stake purports that the property instinct comes into play when understanding what we can do with property. People may have a natural inclination that one person can transfer property and ownership rights to another person. Rules about how to transfer ownership may then be put in place within society to help moderate this aspect of property. With this in mind it seems that property and ownership are not mere creations of society, but more so that a biological property instinct may have aided in the formation of ownership rights, and

people's adherence to them in society. If ownership is considered in this way it may be more of a brute fact than an institutional one. For ownership to work in society the people in that society must respect the rights of owners. However taking into account Stake's view even if society chose not to respect ownership rights we would still be equipped with a property instinct and natural feelings about what we can do with property. Property therefore would exist regardless of whether people recognized and responded to its status. This calls into question the very definitive boundary that Searle (1995) and Kalish (2005) propose; that things must be ultimately be categorised as either an institutional or a brute fact. It seems ownership may lie somewhere in the middle, existing regardless of people's recognition of it, but only having force when society as a whole chooses to respect it.

1.9 Psychological Ownership

Ownership norms may be an integral part of any society. However the questions of why property is so important to people, and what it means to a person to possess something, are also ones that need consideration. The answers to these questions may be found in the concept of psychological ownership. Some scholars such as Porteous (1976) believe that people have an innate need to own. According to Furby (1978) a sense of possession i.e. the feeling that an object, entity or idea is "mine" is the core of psychological ownership. Possessive feelings are ubiquitous, and can relate to tangible or intangible objects. They can occur based on legal ownership, or in the absence of it (Wilpert, 1991). Pierce, Kostova and Dirks (2001) described ownership as the feelings of possessiveness, and of being psychologically tied to an object. Possessions and a sense of "mine" help people to know the self. Possessions are almost a storeroom of memories of self- identity. They can also

symbolise what a person values, and what makes them an individual (Cram & Paton, 1993). This account of psychological ownership may explain why certain possessions are important to us. Often possessions that we own represent something significant to us, and we can link memories to these things, for example a hockey stick used in an important match to score the winning goal. Possessions may symbolise different periods of time in our lives, and may represent who we were, and what was important to us at that time. We purchase some things because of our interests or what that object represents to us. This item itself doesn't give us a sense of self, but we want certain things which reflect who we are, and what we value. Possessions are an integral part of self-identity because we actively choose to possess things which represent us.

Belk's (1988) thoughts go one step further than this, claiming the key to understanding what possession means is recognizing that, knowingly or unknowingly, intentionally or unintentionally, we regard our possessions as part of ourselves, or extensions of the self. In essence, whilst having and being are distinct, they are intrinsically linked as we seek, express, confirm and ascertain a sense of being through what we have (Belk, 1988). This feeling encapsulates many things including the letters in our names which are viewed possessively. In claiming that something is "mine" we also come to believe that the object is "me," (Nuttin, 1987). Possessions are an integral part of our self-identity, and we spend much of our time and resources acquiring things, and avoiding their subsequent loss (Constable, Kritikos & Bayliss, 2011). Scholars such as Sartre agree with this reasoning, claiming that the motive behind wanting more things is to enlarge our sense of self, and knowing who we are is observing what we have. This to Sartre is one of the three categories of human existence; we are what we have (Sartre, 1943/2003). Sartre claims that the totality of a person's possessions reflects the totality of that person. James echoed Sartre's

claim stating that, “A man’s self is the sum total of all that he can call his.” He claimed that losing possessions leads to shrinkage of our personality, and a conversion of ourselves to nothingness. If James is to be believed our sense of who we are is founded in what we have. Avoiding loss of possessions is of paramount importance, as in losing a possession we lose a part of ourselves, and who we are.

The importance of possessions in our sense of self can be seen in everyday life. It is demonstrated in the reaction observed when people have these possessions taken from them, for example when they are burgled. Many victims mourn not the loss of the possessions themselves, but more so the loss of something that they felt was a part of them, and held many special memories. A strong sense of self is not a favourable characteristic in places such as prisons, military training camps and monasteries. One of the first steps taken to eradicate this sense of identity is to deprive new members of their personal possessions including clothing, money, and sometimes even names. They are then issued with standard wardrobes and identical possessions in an attempt to lessen their sense of self, and bestow upon them a new standardised identity.

1.10 Empirical Evidence Showing the Effects of Psychological Ownership

The importance of possessions and the feelings of possessiveness towards them have been demonstrated in a number of experimental studies. Due to the fact people may view possessions as extensions of themselves Beggan (1992) hypothesised that people may exhibit a self-enhancing bias when making judgments about objects they own. He referred to this as “The mere ownership effect.” claiming that a target object would be rated more favourably by an owner than a non-owner. In a series of studies Beggan (1992) presented participants with objects and asked them

to rate them for their attractiveness. In the control condition no free gift was given. In the mood-control condition a free gift that was not included in the target objects was given to participants. In the experimental condition, before any objects were rated, participants were told one of the gifts, an insulator for a drinks bottle, had been randomly chosen to be given to them as a free gift. Participants were then asked to rate the items in terms of their attractiveness. Beggan (1992) found that those who had been given the insulator as a gift rated it as more attractive in comparison to the subjects in the other two conditions. A further study demonstrated that this effect was not due to the amount of exposure to the object, or the amount of time participants had to think about the object, but rather ownership as a self-enhancement bias directed towards one's own possessions. He claimed that, because people see their possessions as extensions of their self-identity, enhancing what they own should serve to enhance themselves. His final study showed that participants who received failure feedback on a perceptual judgment task displayed the mere ownership effect, whereas those who received success feedback displayed a reversal of the effect. He concludes that the mere ownership effect may be a manifestation of a motivation to enhance a private or public self. In order to see oneself in a favourable light people will overvalue an object associated with the self (Beggan, 1992).

A concept closely related to the mere ownership effect is the endowment effect. When it comes to trading objects people place greater value on the objects they are selling, than on the objects they are potentially buying. This is known as the endowment effect (Thaler, 1980) and has been demonstrated on a number of different items. When given a coffee mug and asked to trade it, Kahneman Knetsch and Thaler (1990) found that participants demanded a much higher selling price for the coffee mug they owned than they were willing to pay for an identical item when seeking to purchase. From the point of view of the owner, selling an object they own

is seen as a loss, and this loss is more negative to them than the positive gain is to the potential buyer.

The effects of psychological ownership can also be seen in other aspects of life. People treat objects they own differently to those they do not. For example, ownership enhances feelings of responsibility for the target by the owner, and this feeling leads people to be protective, nurturing and caring for the target (Rudmin, 1991). Other effects of psychological ownership include a superior memory for those objects that we own (Cunningham, Turk, Macdonald & Macrae, 2008), and more positive attitudes about owned objects in comparison un-owned ones (Nuttin, 1987). Psychological ownership can also have effects in organisations. If employees feel a sense of ownership for the organisation this can lead to greater commitment towards the organisation and higher job satisfaction. It can also significantly add to the prediction of organisation based self-esteem (Van Dyne & Pierce, 2004).

1.11 Psychological Ownership in Children

Psychological ownership is also important in children's lives. Allport (1937) hypothesized that the process of gaining an identity, and thereby gaining self-esteem, progresses from infancy by extending the self via a continuously expanding set of things regarded as one's own. Furby (1978) extended this hypothesis, explaining that children's interactions with tangible items are a means of self-definition. As the child receives feedback about what she can and cannot touch, explore or control, those items become associated with her "self," whilst those she is prohibited from touching become associated with the "other." Gradually these possessions help develop a distinction between the self and other, mine and not mine. This sense of "mine" helps a child develop a sense of control and thus identity and self-confidence.

Furby (1978) asked six, seven, ten and sixteen-year olds questions such as, “What does it mean that something is yours?” and “Why do people have things that belong just to them?” The answers to these questions from the three groups of younger children focused on possessions making activities possible and bringing enjoyment to people. Seven year olds cited reasons such as to prevent boredom and because people need them. However at age 10 children mentioned a responsibility of care towards the objects they owned, and the 16 year old adolescents focused on the fact that possessions enhance social power and self-identity. They recognise that society places a high value on possessions and that having possessions enhances one’s status as an individual in that society. Sixteen year olds also mentioned that possessions help define individuality, and are an extension of the individual itself.

The previously mentioned endowment effect, where people expect others to pay more for an object they own than they are willing to pay for an identical object, demonstrates the distinction between mine and not mine, and the importance placed on objects labelled as “mine.” Harbaugh, Krause and Vesterlund (2000) investigated the endowment effect in children aged 5 to 10 years-of-age. Children were given one item as theirs, and then asked if they wanted to trade it for another item of equivalent value. This method was then repeated for a further 2 pairs of goods. Results demonstrated that for every item the likelihood of the child choosing the item increased when the child was endowed with it. Harbaugh, Krause and Vesterlund (2000) claimed that the results demonstrated that the endowment effect was a “real” part of preferences. Children place more value on an object merely because they own it. They value this object more than an identical object, and are less willing to trade it for a different item.

A more recent study which demonstrates the endowment effect in children is that of Gelman, Manczak and Noles (2012). In this experiment 2 and 3-year-olds

were shown sets of toys with 3 toys in each set. The sets were either “identical,” in which all the toys were identical, “participant-plain,” where the participant’s object was plain and undesirable compared with the other two objects, or “varied,” where all the objects were different but equally desirable. During the task the researcher brought out the 3 objects in a set and held them up one at a time. One object was assigned to the researcher, “This is mine,” one to the child, “This is yours” and one was assigned to neither the child nor the researcher, “Look at this.” The researcher then asked the children, “Which one do you like best?” and “Which one do I like best?” Results showed that in the “identical” condition even the youngest children preferred the objects to which they were assigned as owners, despite the fact the objects in this condition were physically indistinguishable from one another. In the “varied” sets, where the two objects were different to the object the child had been assigned, both 2 and 3-year-olds also chose the object which they had been assigned ownership of as the object which they liked best. Only when the item that children had been assigned ownership of was markedly less desirable than the other two objects, did children fail to choose their object as the one they liked best. The results indicate that children will like an object more if they are assigned ownership of it. In the identical sets children could not have been basing their decisions of liking on a particular type of object, as all the objects in this condition were exactly the same. The results support both the endowment effect and the mere ownership effect in that ownership of an object adds value to it, and leads to a preference for that exact object, not just that type of object. The authors claimed that the results demonstrated that positive evaluation of, and preference for, one’s own possessions is a basic cognitive disposition.

Hood and Bloom’s study (2008) does not perhaps demonstrate the endowment effect as clearly as the previously mentioned studies. However it does demonstrate the importance of particular objects to children, and supports the theory that even

from a young age children view certain owned objects as extensions of themselves (Allport, 1937). In this study children aged 3-6 years-of-age were shown a “copying machine,” which could produce exact replicas of any item. Children were asked to bring with them an attachment object, which they regularly slept with, and had owned for at least one-third of their life. If they did not have an attachment object they were asked to bring an object which they currently liked. The “copying machine” was demonstrated to children, who were then allowed to pick original toys or exact replicas to take away with them. Following this the experimenter suggested that they copy the child’s attachment object. If the child agreed their object was “copied,” and children were then asked which object they would like to keep. Results showed that, when toys not owned by the children were being copied, children who had brought an attachment object, and children who had not brought an attachment object were happy to select the copied toy as the one they wished to keep. However when it came to copying children’s attachment objects results were markedly different. Some of the children refused to allow their attachment object to be copied, and only 23% of the children who did allow their toy to be copied chose the copy. Children without attachment objects were happy for their objects to be copied and 62% of children chose the copied objects. The results show that children who are attached to an object prefer this object to an exact replica, and will choose to keep this object when given the choice between the two. The results suggest that children develop attachments to some objects, which are independent of their perceptual properties. Hood and Bloom (2008) suggest this preference for the attachment object may be down to hidden invisible properties of the object, which are not copied by the machine in the experiment. One of these invisible properties may be that the object is owned, and as such is viewed by the child as an extension of themselves. The object that is owned, “mine,” is distinct from the copied object, “not mine,” and may help to define

the individuality of that child (Furby, 1978). If possessions are viewed in this way then children will be less willing to trade their objects, even for exact replicas, as they may view it as a shrinking of their distinction between themselves and others.

Whilst perhaps not as complex as adults' understanding of psychological ownership children do demonstrate a preference for objects they own; being unwilling to trade them for items of equivalent value, expressing a liking for them over other identical objects, or objects of similar desirability but a different physical appearance (Gelman, Manczak & Noles, 2012). Children were also more likely to choose an original item over a copy, despite the fact that the copy was identical in all its perceptual features. Ownership itself may be invisible. However ownership of objects has implications for self-definition early on in life and, as children get older, an enhancement of social power and self-identity (Furby, 1978). An understanding of ownership, and the rights it affords, is therefore very important to even young children.

The preceding sections reviewed legal theories of what property is, the rights it affords an owner, and what constitutes ownership in law. The social aspect of ownership and the psychological aspect of ownership for both adults and children were also considered. The subsequent part of the thesis focuses on the development of children's understanding of ownership. Initially, areas of knowledge relevant to ownership will be discussed, such as children's understanding of intention, their reasoning about artefacts, and their understanding of morality in relation to moral and social conventional events. Finally empirical studies directly relating to children's understanding of ownership, and the rights it affords an owner will be considered, and the theories which endeavour to explain how children infer who owns an object will be assessed.

1.12 Children's and Infants' Understanding of Intention

As has been previously discussed intention is an integral part of ownership, with adults discounting a character's claim of ownership over an object unless they demonstrate their intention to own it. It is important not only to have the intention to own, but also to make this intention known to others. One must also recognise and respect others' intentions to own. In order for children to successfully reason about ownership they must understand the role of intention in these decisions.

A simple non-verbal method that has been used for testing infants understanding of concepts such as intentions is the habituation paradigm. In these studies infants are shown one event on repeated occasions. Initially infants will spend a lot of time looking at the event, but after repeated exposure to it their looking time decreases. When it has decreased to a fixed criterion a novel event is presented. If infants distinguish between the two events an increase in looking time should be observed. This renewed looking time is referred to as "dishabituation."

A study by Gergely, Nadasdy, Csibra and Biro (1995) used a habituation paradigm to demonstrate that children aged 12-months-old could take the intention of an agent into account when interpreting their goal-directed spatial behaviour. Their results also showed that infants at this age are able to evaluate the rationality of the agent's goal directed behaviour; something which is necessary for a comprehensive understanding of intention. Carpenter, Akhtar and Tomasello (1998) tested the imitative ability of infants aged 14 to 18 months, asking them to distinguish between accidental and intentional actions. If infants understand intention they should preferentially reproduce intentional over accidental actions. Results indicated the infants imitated significantly more of the intentional than the accidental actions,

demonstrating that even young infants have an ability to distinguish intentional from accidental actions.

Meltzoff (1995) used an action paradigm to test whether children understand failed intentions and infer what the intended action had been, thus providing evidence for an intentional stance. Infants aged 18-months-old were introduced to a series of novel toys that could be acted on in specific ways. For some children the experimenter demonstrated the target action e.g. pulling apart a wooden dumbbell, whilst other infants observed the experimenter failing to demonstrate target acts. The results showed that when the infants were given the chance to imitate the experimenter the ones who had seen a failed action inferred what the experimenter intended to do, and imitated that action. A further study showed infants did not attempt to produce the target action when they had seen successful or unsuccessful demonstrations by a non-human agent. Meltzoff concluded that 18-month-olds represent the behaviour of people in a psychological framework involving goals and intended acts, not just merely physical movements.

Later studies by Bloom and Markson (1998) and Preissler and Bloom (2008) showed that older children consider intention when naming or interpreting the name of a picture. Bloom and Markson (1998) asked children aged 3 and 4 years of age to draw pictures of a lollipop, a balloon, themselves and the experimenter. The younger children were asked to draw two pictures and the older children four. Following some other tasks the experimenter “rediscovered” the child’s pictures and asked them to describe what they had drawn. Due to the lack of artistic ability of most children at these ages the experimenters proposed that the subsequent naming of the pictures could not be based on their appearance, but instead would have to be determined by what the children intended to represent when they initially drew the pictures. Results showed that children did name their pictures based on their initial intent and not on

the subsequent appearance of them. Some children were insistent on their answers, forcefully correcting the experimenter when they suggested the incorrect description. This demonstrates that children can take intention into account when naming their own pictures. Bloom and Markson (1998) go further than this suggesting that children take intention into account when naming pictures that accurately depict their referents. They propose that children might call a picture of a bird “a bird” not merely because it is similar in looks to an actual bird, but because its appearance makes it likely that the creator intended to create something that represented a bird.

A study by Preissler and Bloom (2008) provides evidence that children take intention into account when naming pictures which they themselves have not drawn. In this experiment 2 year olds were given two test trials in which they were given two novel objects to explore. The experimenter then told the children that they were going to play a game. She showed the child two empty boxes and placed one object into a box with the lid left open and the other into the other box with the lid subsequently closed. The experimenter then picked up a clipboard and pretended to draw a picture. The child could not see what the experimenter was drawing but could see where the experimenter was looking. In the “Away” trial the experimenter stared at the wall behind the closed container whilst drawing her picture. In the “Into” trial the experimenter stared into the open box. The picture the experimenter had drawn was labelled with a novel word (a spoodle) and placed in front of the child. The objects were then removed from the containers and the child was asked to show the experimenter which one was a “spoodle.” There were three potential answers to this question. The children could choose either of the two novel objects, or the picture itself. The researchers predicted that if children were taking into account the experimenters intention, as reflected in the direction of her gaze, they should be more likely to choose the object in the open box as being the “spoodle” in the “Into” trial. In

the “Away” trial, where no clear intention was shown by the experimenter, the children should choose the item in the closed container, or the picture itself, as the “spoodle.” Results from the children’s answers showed that this was the case, with over 90% of children choosing the item in the closed box or the picture in the “Away” trial, in contrast to 62.5% of children choosing the item in the open container in the “Into” trial. These results suggest that children at this age are sensitive to artist’s intent when making decisions over what a picture represents. An alternative explanation of these results may have been that the gaze of the experimenter did not indicate her intention, but merely drew the children’s attention to where she was looking, leading them to choose the object closest to that. Another possibility could be that the children infer from the experimenter’s gaze that the object she is looking at is the object which she wants them to choose. If either of these explanations is correct then it would seem that children aren’t basing their decisions on the inferred intent of the experimenter. A second experiment ruled out these two alternative explanations. The second experiment was similar to the first save that, rather than drawing the picture, the experimenter discovered the picture, after staring either “into” or “away” from the open box. When asked to choose the “spoodle” if it is just the direction of the experimenter’s gaze that is influencing decisions children should choose the object in the open box in the “Into” condition and the item in the closed box, or the picture, in the “Away” condition. Results showed that this was not the case, and in fact there was no significant difference between the two conditions. Children selected the item in the box the experimenter was looking into only if the experimenter was drawing the picture, demonstrating that they used the experimenter’s gaze to infer intention, and used this to interpret the name of the picture that was drawn.

The research above shows that children from a young age understand intention. Infants are able to distinguish between accidental and intentional actions,

and can also understand failed intentions and use these to infer the intended goals. At the age of 3 and 4 years old children are also capable of naming their own pictures based on what they intended to draw, regardless of the appearance of the physical article. From the age of 2 will use cues such as the directions of someone's gaze to infer their intention, and will use this information when interpreting the person's drawings. It seems then that children are capable of understanding intentions and using them to explain their own actions and the actions of others.

1.13 The Role of Intention in Children's Naming of Artefacts

In this thesis the focus of the research on ownership will be on man-made artefacts, and whilst the preceding section demonstrates children understand intention in relation to accidental and intentional actions, and use intention to decide how a picture should be named, it is also important to assess children's knowledge of intention relating to human-made objects.

Keleman (1999) presented four and five-year-old children with pictures of novel artefacts that were designed for one purpose, but intentionally or accidentally used for some other activity. For example in one trial children were told that Lucy made this object to keep coffee warm. She then gave it to Joe who, depending upon the experimental condition, accidentally or intentionally ended up putting his hamster in it, either once or frequently. When asked what the object was "for" children chose the original function of the artefact regardless of what else the artefact had subsequently been used for.

Gelman and Bloom (2000) also found that children are sensitive to how an artefact is created and whether this creation was intentional or not when deciding what to name it. Children aged 3 and 5-years-old were told stories about a target

object. In one of the stories the object was intentionally created, and in the other it happened by accident. In the intentional condition children were told that Jane bent and folded a newspaper until it was just right. In the accidental condition children were told that Jane dropped her newspaper by accident and it fell under a car. The researcher read the story to the children and then showed them the corresponding object and asked, "What is it?" In both conditions the artefact that had been intentionally or accidentally created was pre-tested on adults to make sure it looked like the intended object (e.g. the newspaper/hat looked like a hat). Results showed that children as young as 3 years-of-age take intentionality into account when deciding what to name an object. Children are more prone to use an object's name when the object is described as created intentionally, and to describe the substance the object is made of when describing the result of an accident. German and Johnson (2002) have suggested children also expect the person who makes the object gets to decide on its name regardless of what other people call it. They showed 5-year-olds a picture of a novel artefact and explained that the person who made it called it a "tog," but that its current owner called it a "fep." When asked what it was really called children tended to say that it was a "tog" rather than a "fep," siding with the name the designer intended for it over the name it had been given by its current owner.

Diesendruck, Markson and Bloom (2003) also demonstrated that children rely on creator's intent when extending names for artefacts. Children, aged 3, were shown triads of novel objects; one target object and two test objects. One of the test objects was similar to the target object in shape, but could not perform its function. The other test object was different in shape, but could perform the function of the target object. The important manipulation however was the information the children were given about the objects. In one condition children were only provided with a name for the target object. In another condition children were given the name and a possible

function of the object, and in the final condition children were given the name and the designers intended function of the target object. Children were then asked to pick a test object that was the same as the target object. Researchers were interested in whether children extended the name of the target object to the test object which most closely matched the shape of the target object. Results showed that in the label only and label + possible function conditions the frequency of shape match selections did not significantly differ. However in the label + intended function condition children chose the test object which most closely resembled the function of the target object, thus supporting the idea that children name an artefact on the basis of intuitions about the intent of its creator.

Jaswal (2006) also showed that children will choose the designers intended function as the function of an artefact, even when it closely resembles a conventional artefact. Jaswal presented 3 and 4-year-olds with pictures of hybrid artefacts created by pairing together similarly-shaped objects such as a key and a spoon. The hybrid had features of both categories but was computer generated to look more like one than the other. Children were shown the pictures but the label used for the artefact did not match what one would expect based on the appearance of the hybrid artefact, e.g. the key-like hybrid was referred to as “this spoon.” The experimenter told the children they had either found the object or made the object, “I am going to show you something that I made/found! Look at this! This is an X that I made/found! Can you show me what this does?” Children could make an inference about the function of the hybrid artefact based on its label or its appearance. Results showed that when the experimenter had made something, “a spoon I made,” children were more likely to infer it would be used to eat cereal, despite the fact it looked more like a key than a spoon. When the experimenter introduced the object as something they had found, “a spoon I found,” children were ambivalent, being as likely to infer that it was used for

starting the car as for eating cereal. This study is unique in that it used artefacts that resembled familiar categories and familiar labels that didn't match those categories. Children were asked to view a key-like object which was referred to as a "spoon I made." Even though they would usually view this object as being for starting a car, when they were told it had been intentionally created to serve another purpose children rejected the conventional use of the object, in favour of the designers intended use.

The findings from the aforementioned studies demonstrate that children are able to understand the more abstract properties of artefacts. They can take into account the intention of the creator in the design and naming of artefacts. They weigh this information against the other uses people may have put the artefact to, as well as the other names they may have given to them. Thus it appears children are able to reason about intention in a number of different ways. They must reason that someone intended to create the object, intended to name the object, to use it for a particular purpose, and perhaps even intended to give the object to someone else. If children understand that the creation of an object was the result of an intentional action, and acknowledge that this creation affords certain rights to the creator, children may reason that this object should be owned. If the object is not owned the creator has no right to name the object or to use it in a particular way, as these rights are exclusively attributed to the owner of an object.

1.14 Children's Understanding of Morality

An understanding of morality is also important in children's understanding of ownership. It is important for children to recognise that if something does not belong to them they are prohibited from taking it and using it without permission.

Furthermore, moral agency is intimately related to an understanding of social reality, which encompasses interpreting mental states and an understanding of status and norms; all concepts which are important for a child to have an understanding of ownership. Whilst morality is one domain of social event it is distinct from others such as social conventional events (Nucci & Turiel, 1978). Siegal and Storey (1985) make a distinction between moral transgressions and conventional or social transgressions. Social conventional rules are defined relative to the social context a person is in. They constitute general and shared knowledge of uniformities in social interactions, and are determined by the social system in which they are formed, e.g. a dress code in a school or place of work (Nucci & Turiel, 1978). Only events which involve violations of implicit or explicit regulations would be regarded as conventional transgressions. Outside the relevant setting these acts are no longer deemed to be “naughty”. In contrast moral transgressions are not tied to social contexts, but are judged as intrinsically wrong regardless of whether a social rule exists or not. Moral issues are not determined by social regulations, but are instead structured by underlying concepts (Damon, 1975). Moral events include the justice, welfare or rights of something to which the person is entitled, e.g. taking something that belongs to another person.

As has been previously mentioned the role of intention in understanding ownership is crucial. However intention is also important when making moral judgments. Research has shown that when 5 and 6-year olds make moral judgments they take the intention of the perpetrator into account when viewing how “naughty” this person is (Karniol, 1978). Moral judgments are also important as many arguments between young siblings are about ownership and involve violations of possession rights (Ross, Filyer, Lollis, Perlman & Martin, 1994).

Research shows that even young children distinguish moral violations from violations of social convention. A study by Nucci and Turiel (1978) investigated whether pre-school children aged 2-5 years-of-age made a conceptual distinction between social conventional and moral events. An observational study of spontaneously occurring events at 10 different pre-schools was carried out along with interviews of the children immediately after events occurred. The children were asked questions such as, “Did you see what happened?” “Is there a rule in your school about [observed event]?” “What if there weren’t a rule, would it be right to do it then?” Events were considered a moral or social convention transgression if they were responded to by someone in the school. Social conventional events were classified as those that regulated social interactions, and moral events were classified as involving physical or psychological harm to others, violation of rights and deprivation of something to which the person is entitled. Results showed that, in observations of spontaneously occurring behaviours, children discriminated between the events classified as social conventional or moral. Events which the experimenters had classified as entailing moral transgressions were judged by the children to be wrong, regardless of whether there was a school rule pertaining to the act or not. Conversely judgments about social conventional acts were dependent upon their status as implicit or explicit regulations in the school context. The results show that children are aware of the differences between moral and social conventional violations. The results suggest that children view violations of ownership rights, such as taking what belongs to another, as a violation of a moral right, which is wrong regardless of the social context in which it takes place.

In a further study by Smetana (1981) children aged 3 and 4 were presented with moral and conventional stimulus items pertaining to rules that were enforced at the nursery schools they attended. They were shown five moral stimulus items, such as a child taking another child’s apple, and five conventional items, such as a child

not sitting on the rug during story time. They were then asked to indicate how bad this action was by pointing to faces which depicted more and more exaggerated frowns. After indicating how bad the action was children were then asked if the event would be ok if there were no rules about it. For example would it be ok to not sit on the rug at story time if the teacher didn't have this rule, or would it be ok to take another child's apple if there was no rule in place at school prohibiting this. Results showed that both the 3 and 4-year olds distinguished between moral and conventional violations, judging moral violations to be more serious. However only the 4-year olds judged that the ownership violation of taking another child's apple would be wrong, even if there was no rule prohibiting this at school. The 4-year-olds also deemed this ownership violation to be wrong whether it took place at their own school, in their home or in someone else's home. These results demonstrate that by the age of 4-years-old children recognise that the owner of an item has certain rights over it which should not be violated by others, who have no claim of ownership themselves.

Other studies also support the view that children recognise a difference between moral and conventional violations, and view moral violations as much more serious and deserving of punishment than social conventional violations. Smetana (1989) observed violations of rights of children aged 2 and 3-years-old in their home environment. They categorised transgressions in 3 categories made up of 2 categories of moral violations, one of which was object conflict including trying to take a toy from another child. The other moral category was aggression, and the third category was cultural conventions. Their results showed that children were more likely to respond to moral transgressions, such as having a toy taken from them by another child, and respond with emotional reactions and physical retaliation. They also found that even 2-year-olds initiated responses to moral transgressions, and their responses were focused on the intrinsic consequences of the act such as

statements of loss as well as telling the other children to stop the bad behaviour. Few of these responses were observed when conventional rights were violated. It seems clear then that even young children understand the difference between violations of moral and conventional rights, and call for different punishments for these.

All this research suggests that from the age of 2 years-of-age children can distinguish between moral and social conventional rights, viewing ownership rights as violations of moral rights, which are wrong regardless of the context in which they occur. Results from the aforementioned research suggests that as children get older they grasp that moral violations affect others as well as themselves. Nucci and Turiel (1978) found that 2 year-olds generally responded to moral events when they were the victims of transgressions. However Smetana's findings (1981) demonstrated that by the age of 4-years-old children respond to moral violations when they affect third parties, and not just their own interest.

1.15 Children's Understanding of Ownership Rights

The previously mentioned studies consider ownership rights only in so far as they fall into the category of moral events. However they do not provide a comprehensive account of what children know about ownership and the rights of owners. Therefore it is important to consider empirical studies which provide more specific insights into these areas. An understanding of ownership is an integral part of children's life and development because it promotes harmonious behaviour. Understanding how to behave in relation to owned objects is vital for successful socialisation. Object disputes are the earliest conflicts to arise between young children. They are also the most frequent and acute types of conflicts that young children engage in (Ross & Conant, 1992). On average, children are involved in

disputes with their peers more than nine times per hour, and the largest percentage of toddler and preschool disputes involve the possession and use of objects (Hay, 1984).

A number of studies have demonstrated that children reason about ownership from a very young age. Hay (2006) established that children begin to use possessive pronouns between 18 and 24 months-of-age, which could indicate that by this age they are beginning to understand that people, including themselves, can own things. Fasig (2000) demonstrated that children aged 18-24-months could identify their belongings, and could differentiate between these objects, objects that belonged to their mother, and objects which belonged to the researcher. Other studies have also shown that children react differently in situations based on whether they are an owner or not. In one such study children aged 30-to-60-months were given objects and told they were either theirs to keep and take home, or they belonged to the class and must be left there when the child went home (Eisenberg-Berg, Haake, Hand & Sadella, 1979). Results showed the children who had been told the toys belonged to them defended them more than those children who had been told the objects belonged to the class. In a similar study it was found that children aged 3-to-5-years maintained possession of, defended, and stated they owned toys more often in the own condition than in the class condition. They also shared own toys less than class toys (Eisenberg-Berg, Haake & Bartlett, 1981). Conant (cited in Ross, 1996) also found that in a lab playroom children between 23 and 25 months were much more likely to win conflicts over toys they owned, and that the dominance of owners occurred, regardless of which child had possession of a toy when the conflict began. Children were also much more likely to claim ownership of items that had been designated to them, regardless of the current possession of the toy. In addition to this findings showed that, in the group where none of the toys were owned, the children

were twice as likely to interact with one another in play with a common toy, to offer and exchange toys, and also to engage in conflict over them compared with the children whose ownership had been established.

Research by Ross (1996) gives an insight into the understanding children have of ownership rights. Pairs of siblings aged 2-and-4-years-old, and their parents, were observed in their homes during free play. During this time details about property conflict, such as the type of conflict and children's reasoning as to why they should get to use the disputed object, were recorded. The siblings were involved in many property disputes, with most focused on possession and ownership disputes. Interestingly, more than 60% of the children's disputes were over objects that neither of them owned. This result, and the previously mentioned findings of Conant (in Ross 1996) may suggest that children have an understanding that they are unlikely to win possession of an object which they know someone else owns, and are therefore more likely to fight over un-owned objects. Arguments over possessions owned by one or the other child took two forms. In one case one child possessed and owned an object that another child wanted. In other disputes, a non-owner possessed a toy and wanted to continue using the toy at the same time the owner of the object also wanted to use the toy. These types of property disputes are interesting as they pit possession against ownership. Results showed that conflict outcomes were largely influenced by children's ownership. Regardless of which child had possession of the object when the conflict began, 75% of conflict outcomes favoured owners over non-owners. Children in all age groups, including the 2 ½ year olds, were more than twice as likely to claim objects as their own (e.g. "mine") when they were owners, than when they were either the current possessor of the object, or when they attempted to forcibly take property from owners. This evidence would suggest that ownership is a central principle governing the resolution of sibling conflicts from a young age. It also

shows that at this age children are aware of the difference between possession and ownership, and recognize the entitlement of owners over possessors.

The studies above demonstrate that children can reason about objects with which they are familiar, will modify their behaviour towards objects when they are specifically told whether they own the object or not, and will mostly view ownership as the governing principle of property entitlement. Further studies also demonstrate that children understand and uphold ownership rights, even when they are being given competing information from their parents. A study by Ross, Tesla, Kenyon & Lollis, (1990) observed how parents interacted with their children when they were playing with their peers in a home environment. Researchers were particularly interested in how children's conflicts over property were resolved by their parents. Results showed that when children were playing with peers, 92% of parents' interventions were addressed to their own child, with 90% of these interventions favouring the other child. In most conflicts over property, mothers asked their child to yield the toy to the peer, but were also inconsistent in their support of ownership rights. When their own child owned the toy mothers favoured the non- owning peer, but when the other child was the owner, mothers supported that child's claim of ownership over their own child's. The same pattern of results was observed when a child had initial possession of the toy. Mothers did not favour the rights of possessors unless the peer was the initial possessor of the toy and when the mother intervened against her own child, the support given to the other child was often unexplained, regardless of when the mother was supporting the ownership or possession rights of the peer. Mothers in this study may have acted like this as they were reluctant to discipline someone else's child, especially in the presence of their parent. They may have directed their interventions towards their own child simply in order to end the conflict. If indeed parents acted like this because they were not dealing with their own children, observing the

interventions parents made in the sibling study mentioned above should provide a more accurate portrayal of how parents intervene in their children's conflict when they are not constrained by politeness norms.

Ross (1996) found that parents did intervene in 65% of the conflicts between siblings, but their interventions were largely inconsistent, sometimes upholding ownership rights, whilst at other times supporting possession rights. Parents upheld the ownership rights of a sibling in 71% of their interventions but only if the owner of the toy also had possession of it. When the owner of a toy another sibling possessed challenged this possession, parents only supported owners 50% of the time. For example, if John was playing with Matthew's truck, parents often allowed John to retain possession of the truck even if Matthew protested. Without parental intervention, if a child owned a toy they also had possession of, children favoured the owner of the item 80% of the time during conflict resolution. When parents intervened, ownership rights were only upheld 68% of the time. Similarly, when owners challenged current possessors owners won 74% of the time without parental input, and only 65% of the time when parents got involved. Thus it seems even when parents are not constrained by property norms they remain inconsistent in their endorsements of owners' rights, and moderate the degree to which children favour owners in their own resolutions. However children do generally uphold the rights of an owner in property disputes, despite the influence of their parents.

Whilst these results suggest that parents' reason about ownership rights in a different way to children this may not actually be the case. Parents may have intervened inconsistently in conflicts as their main objective was to end the dispute in the fastest way possible. Parents may recognize the rights of the owner, but may also feel that to function successfully in society, young children especially, must learn to share their belongings. The interventions in which they did not endorse the owner's

rights therefore may have been an attempt to foster this attitude in their children, rather than encouraging the absolute rights of the owner in all situations. Parents' reasoning in these cases may reflect a more flexible view of ownership. They understand the rights of owners over possessors, but also acknowledge that many other factors need to be taken into account when making ownership decisions. In the case of sibling conflicts parents may have accounted for who would react most strongly to being deprived of the toy. Children, in contrast, may be more rigid in their conception of ownership rights, viewing an owner as having complete control over the object, while failing to see any situations where it may be necessary to temporarily relinquish these rights. It could be that adults and children reason about ownership in the same way, but when making ownership decisions adults are more astute at adapting to the context in which they find themselves, in contrast to children's more absolutist conception of the rights of an owner. What is clear though is that children do have an understanding of ownership rights from a young age, and will assert these rights when they are challenged by a peer or an adult.

A more recent study focusing on violations of ownership rights has shown that 3-year-old children are not only willing to assert their ownership rights, but will also object to the violation of other people's property, viewing it as morally wrong. In a study by Rossano, Rakoczy and Tomasello (2011) a puppet attempted to steal or throw away property belonging to the child themselves, a third party or the puppet. Results showed that 2-year-olds protested when their property was taken or thrown away, but they generally did not stand up for the rights of a third party when the puppet attempted to take or throw away their property (Findings consistent with the results from Nucci & Turiel who found children of this age generally respond to events such as these when they themselves are the victim). In contrast whilst 3-year-olds protested more often when their own item of clothing was taken or thrown away, they

still protested when a puppet attempted to take or throw away a third party's clothing. Interestingly 3-year-olds protested more vehemently when the puppet attempted to throw away someone else's property than when they attempted to throw away their own. This suggests an understanding of property rights, which allow a person to do what they like with their own property, in this case throwing away the items of clothing they owned, but prevents them interfering with other's property rights, and throwing away their clothing. The reasons children gave for their protests showed they understood the rights of ownership that people have, "You can't do that, it's hers." These protests suggest children have some knowledge of the rights of owners compared to non-owners, and were protesting to the puppet's actions, not because they did not like clothing being taken or thrown away, but because they recognised that if something didn't belong to a person they do not have the right to take or destroy it.

A study by Olson and Shaw (2010) also showed that children seem to have an understanding that people can also own ideas, and these ideas should not be used without permission. In their first study the authors read vignettes to children between the ages of 6 and 11 years-old about two characters drawing objects. In one of the vignettes one of the characters drew an object, and the other character copied it. In another vignette the characters drew the same picture, but were on opposite sides of the room so there could be no copying. In the final scenario the two characters drew their own pictures which differed from each other. Children were then asked how much they liked the character when the character had copied, had drawn the same picture as a coincidence and had drawn their own picture. Results showed that children at all ages preferred a character when they had drawn their own picture, rather than when they had copied. A second study showed that 5-year-olds, but not 3 and 4-year olds, also preferred a character who had not copied someone else's work.

In a final study the authors asked the children why they viewed the character negatively when he copied another character's drawing. Almost half of the children aged 5-years and above mentioned the plagiarising of the other character's drawings when justifying their negative evaluations of the character. The negative evaluations of characters who purposely copied others' work suggests that, whilst an understanding of the rights associated with ideas seems to increase with age, children as young as 5-years-olds have some understanding of the concept that ideas can be owned, and the ownership of these ideas bestows rights on the owner similar to the rights of property, in that another person cannot take them without consent.

Whilst the previously mentioned studies suggest that even very young children have some concept of ownership and the rights it affords, several studies oppose this theory, suggesting that young children know little about ownership and what it really means to own something. A study involving 5 and 6-year-olds investigated their understanding of the rights associated with ownership of public property, such as public buses and public schools. The results showed that younger children lacked a mature understanding of public property, and this understanding was not evident until 8-to-9-years old (Cram & Ng, 1994). In another study by Cram and Ng (1989) children aged 5 years were asked to judge children's interactions with a shop keeper. Most of 5-year-olds believed that children could not take home objects given to them as gifts, won as prizes or earned as payment, indicating that the shopkeeper retained control of the objects. Whilst the research may suggest that children at this age and below lack an understanding of ownership rights, there may be other explanations for the results that were found. For example children may have found difficulty identifying the owner of public buses or farmland, due to lack of experience in these areas of ownership, and with these items (Cram & Ng, 1994; Berti, Bombi & Lis 1982). Similarly when being asked to make ownership decisions involving a shopkeeper

(Cram & Ng 1989) the children may have failed because the stories did not involve them directly. Children may be more astute at making ownership decisions when they can put themselves in the position of the owner of the object or the receiver of a gift, and make decisions based on how they would feel transferring or gaining ownership rights. Alternatively, children may have been unfamiliar with a shopkeeper giving away items, as their experience would tell them you customarily buy things from a shop, rather than receive them for free. Hence why they viewed the giving as more of a loan than a permanent transfer. Indeed 65% of the 5-year-olds in this study judged an object bought from the shopkeeper could be taken home.

Two studies by Hook (1993) also suggested that young children seem to lack an understanding of ownership and the rights that ownership affords a person. Children aged 4 years and older were asked to rate the badness of characters who lost or destroyed a toy that belonged to themselves or someone else. It was not until the age of ten that children rated the character, who lost or destroyed someone else's property, as worse than if it was their own property. In a second study children were asked to rate the badness of a character that refused to give a toy back to its original owner after acquiring it through gift, loan, finding or theft. Children aged 4-to-6 years of age failed to discriminate between characters who acquired the object by theft and those who acquired it as a gift, rating both characters equally bad for their refusal to return the object. Hook claimed his findings showed that young children do not understand ownership in the way adults do. For them, ownership is akin to holding an object on loan. Again in these studies the children may have failed due to the fact they were not involved in the situations directly. Hearing a story read to them and being asked a question about the ownership rights of the people in the story is very different to being personally involved in the situation. In fact a later study by Rossano, Rakoczy and Tomasello (2011), in which children were personally involved in the

situation, showed that children as young as 3-years-old know that taking someone else's object, and throwing someone else's object away, are violations of their property rights. Furthermore to claim that children under the age of 10-years view ownership as akin to lending merely because they don't rate a character who destroys or loses someone else's property as "more bad" than if they destroyed or lost their own seems to underestimate children's understanding. Results show that children of all ages judged both actions as bad, which may just reflect their understanding that losing or destroying property, be it their own or someone else's is an undesirable action, and most likely one that, in their experience, would be punished. The fact that they did not rate losing or destroying someone else's property as significantly worse than losing or destroying their own does not unequivocally suggest that children do not understand the rules of ownership, and view it as akin to lending.

One aspect of ownership, and ownership rights, that children seem to struggle with is transfers of ownership, and understanding when ownership can be permanently transferred. In a study by Friedman and Neary (2008) children aged 3-4-years-old were told stories in which one character gives a toy to another as a present. The toy was then placed in the middle of the two characters and the child was asked which character owned the toy. Results showed that children were as likely to select the first possessor of the toy as the owner as often as the second, despite the fact the first character had given the toy to the second as a present. Blake and Harris (2009) also tested whether young children (2-to-6 years-old) recognize permanent transfers of ownership, and whether they can differentiate between legitimate and illegitimate transfers. Children were presented with stories describing the transfer of a toy between two characters. In one instance this toy was found in the givers bedroom, wrapped up and given as a gift to the other character for

their birthday. In the other condition the first character placed the toy on the ground while they went to get a drink of water and it was stolen by the second character while they were away. Children were then asked who the toy belonged to, and whether that person could take it home, or whether they should return it to the original owner. Results showed that 2 and 3-year olds tended to identify the first possessor as the owner of the object regardless of the kind of transfer that had taken place. Four-year-olds acknowledged that permanent transfers of property were possible, but struggled to differentiate between legitimate and illegitimate transfers, allowing characters to retain control over property be it stolen or a gift. It was not until the age of 5-years that children recognised the permanency of some transfers of ownership and successfully differentiated between legitimate and illegitimate transfers.

These findings do suggest a lack of understanding of ownership rights in children younger than 5 years-old. However these results may have been obtained due to the scenarios being unusual to children. Children are used to gifts being given wrapped up, usually at birthday parties, and certainly not being played with before they are given. In a subsequent experiment by Friedman and Neary (2008), in which a wrapped present was given to the second character as a birthday present, children as young as 3-years-old chose the second character as the owner of the toy despite the fact they were not the first possessor of it. Similarly, whilst younger children failed to differentiate between some legitimate and illegitimate transfers in the study by Blake and Harris (2009), they were successful at recognizing a transfer of ownership when it involved a wrapped gift in a highly salient context such as a birthday party. This again suggests that children have more of an appreciation of ownership rights than some of the results would initially portray.

A study by Kim and Kalish (2009) however also supports the view that young children do not have a mature understanding of ownership. Their work demonstrated

that children aged 4-to-5- years of age did not recognise all different types of property transfers. Whilst they recognised that an owner had precedence over a borrower or finder, they deemed a seller to retain some control over the object even once they had sold it to another person. It was not until the age of 7 that children reliably selected the owner as having control of the property over the seller. Again there are issues with interpreting the results as definitively as this. Whilst younger children did not reliably indicate that new owners could control property even if the original owner protested, they did treat buyers as having more control than finders or borrowers, suggesting that they had some appreciation that different types of property transfers lead to different ownership rights. Further analysis also revealed that when a non-owner proposed a change to the object, and the owner objected, children deemed the owner as having the right to decide what was done to the object. However when the owner proposed a change and the non-owner objected, children deemed the non-owner as getting to decide what was done with the object. It seems therefore that in some cases, rather than lacking an understanding of ownership rights and the transfer of them, children were giving the control to the person who objected to the proposed change, regardless of whether they were the owner or not. In a second experiment, similar to the first, Kim and Kalish, (2009) tested whether 4 to 5 and 7 to 8-year-old children were able to track changes of owner's rights across transfers via gift giving. They found that children appreciated that an owner could control their property against the wishes or proposals of a non-owner. Many of the older children, and some of the younger children, were able to track owners' rights, even when ownership was transferred, understanding that rights could be given up when the object was given to someone else, and that that person could gain the ownership rights as the recipient of the gift. Younger children seemed to be split between two response patterns, an appreciation of ownership rights and an understanding of the

outcome of transfer, or a denial that any character could carry out their proposed actions on the object when the other character objected. Whilst it could be claimed that results in Experiment 1 demonstrated that young children lack an understanding of ownership rights Experiment 2 seems to suggest that young children appreciate ownership rights, and can track these rights when they are transferred. In the cases when young children refused to uphold the rights of the owner, the reasons for this seemed to be that another person objected to the proposed change, rather than children lacking an understanding of what a person can do with their property. Young children may have understood the owner can do what they wish with their property, but may have sided with the other character as they vehemently objected to the proposed action. Siding with the objecting non owner in a dispute over an object is very similar to what children of this age did in Experiment 1. These results then do not unequivocally demonstrate that young children lack an understanding of ownership rights and the appreciation that they can be given up by one person and received by another.

Despite the fact some of the aforementioned studies do put forward the idea that young children do not have a firm understanding of ownership rights, other work has demonstrated that even very young children seem to possess some comprehension of what people may do with their property. It is true that many conflicts between young children involve ownership, but if they completely lacked an ability to reason about ownership, and the rights it affords, they would have no concept of entitlement, and it would be difficult for them to maintain any form of interaction or relationship with others. Children therefore must have at least a basic understanding of ownership, and the rights it affords, to be able to function in a civil society. The following section will review a number of different theories which may explain how children infer who owns an object?

1.16 How do Children Infer who owns an Object

Whilst it is important for children to understand the rights which ownership affords a person, this understanding is useless unless they are able to infer who owns an object, and therefore who is endowed with the rights of ownership. In order to understand who owns an object it is first important to ascertain who can be an owner. In a study by Noles and Keil (2011) 6, 8 and 10-year-old children and adults were asked who could be an owner from groups such as: humans, including babies, teens, adults and older people, atypical humans, such as individuals who were asleep or ones who were paralysed, and non-human animals such as insects, dogs and monkeys. Results showed that children and adults chose only humans as capable of being owners. However children under the age of 8-years-of-age were more restrictive over who could own, rejecting atypical humans. For example young children deemed people in comas or asleep as not able to own property. These results suggest that children do understand that ownership is a right only available to humans. However they differ in how restrictive they are at determining who can own within the parameters of "humans." Due to the fact that young children may be more restrictive when it comes to determining who can own, all the characters used in the stories throughout the research in this thesis were typical humans.

Some of the first studies to focus on how children infer ownership of objects with which they had not had prior contact, and where they are not explicitly told who the owner is, were those of Friedman and Neary (2008). In the first study children aged 2, 3 and 4-years were told stories of two characters playing with an object, either a teddy or a ball. In the stories, set in a neutral context, one character played with the object, and then the other character played with it. The toy was then placed either between the characters (middle at end condition) or remained with the second

character (possessed at end condition). The children were then asked “whose (toy name) is this?” Despite the fact the children could have selected either one of the characters as the owner, neither of the characters, or indeed both, results showed that regardless of the end position of the object children chose the first possessor as the owner. A further study showed that the end position of the object affected 2-year-olds performance, but regardless of whether the object was placed in the middle of the two characters or remained with the second character, 3 and 4-year-olds selected the first possessor as the owner. Friedman and Neary then showed this first possessor heuristic was not merely based on an association made between the first character and the object. A third study demonstrated that when neither character possesses the object, but instead are merely associated with it, there is no preference to select the first associate as the owner of the object. In a further study Friedman and Neary (2009) presented adults and children (aged 4-5 years) with stories similar to those of *Pierson v Post*, pitting an initial pursuer against an eventual possessor. Their results demonstrated both adults and children chose the first possessor of the object as the owner over the initial pursuer, demonstrating the importance of first possession in ownership claims. A similar study (Friedman & Neary, 2009) again demonstrated children’s bias towards the first possessor as the owner of an object. Children aged 4-5-years were told a story in which a boy wanted to catch a ladybird that was high above him on top of a bucket. The boy tried to climb up to reach the ladybird on two occasions but failed both times. A girl also wanted the lady bug. She successfully climbed up the bucket and brought the ladybird down. The children were then asked “Whose ladybird is it?” Children mostly chose the girl as the owner of the ladybird as she was the first possessor of the insect. Friedman and Neary (2009) acknowledged that this choice may have been made on the basis that the girl was more strongly associated with the ladybird, as she was the one who had caught it,

rather than on the fact she was the first possessor of the ladybird. To test this assumption children were asked, “Which character wants the ladybird more?” Whilst this question has no obvious correct answer, in this case rather than choosing the girl, who first possessed the ladybird, children chose the boy who had two unsuccessful attempts at retrieving it. This provides more evidence that children base their ownership decisions on first possession rather than an association between a character and an object. These studies demonstrate that children can reason about ownership of objects they are both familiar and unfamiliar with, and that they seem to judge the first possessor as the owner of the object. The aforementioned studies by Friedman and Neary (2008, 2009) provide one theory of how children and adults infer who owns an object. When reasoning about ownership it could be the case that children and adults merely choose the first person they see possessing the object as its owner. However there are some other factors that may play a role in ownership decisions.

Neary, Friedman and Burnstein (2009) found that pre-schoolers infer ownership from control of permission. In their study, children aged 3-5-years saw stories involving two characters and a toy. The first character asked the second if they could play with the toy that was between them. In one story the second character granted permission, and in the other story the second character denied permission. After seeing each story children were asked who they thought the toy belonged to. Results demonstrated that 3-year-olds chose the controller of permission at chance across both stories, but that 4 and 5 –year-olds chose the controller as the owner of the object indicating that by this age children may infer ownership from control of permission. In a second experiment children aged 3-years-old were randomly assigned to one of two conditions. In the controlling condition the preventer didn’t allow or didn’t want the character to play with the toy. In the informing condition the

first character informed the second that that they could not play with the toy as it was an inappropriate time, e.g. lunchtime or bedtime. Results from this study showed that whilst younger 3-year-olds selected between the characters at chance, older 3-year-olds chose the controller of permission as the owner more often than the informer, demonstrating that even these young children take control of permission into account when deciding who owns an object. Work by Shaw, Li and Olson (2012), also showed that children aged 6-8 years-of-age use control of permission to establish who owns ideas, and not just objects. Children judged that a character who was deciding whether the ending of a story could be changed owned the story, rather than a character who was asking for permission to change the ending.

Another way ownership may be inferred is through creative labour. In a series of studies, children aged 3-4 –years were given a box containing three animal shaped pieces of modelling clay (Kanngiesser, Gjersoe & Hood, 2010). They were told everything in their box belonged to them and they could take it home, and everything in the experimenter’s box belonged to the experimenter. The children were told they and the experimenter would each put a piece of clay in the middle of the table. They then experienced three conditions in random order. In the creative-labour condition children were told they and the experimenter would each make something new from the clay. In the possession condition, children were told they and the experimenter would hold each other’s clay animals for an allocated period of time. In the change condition the experimenter told the child that they would both cut a piece off each other’s clay using a plastic knife. Children were provided with cutters and rolling pins to help complete their transformations. Once the requirement of the condition had been filled, children were instructed to put the clay back in the middle of the table. The children were then asked “Whose...is it?” and “Who gets to keep it?” Results showed that children aged 3 and 4-years-old were more likely to transfer ownership in

the creative-labour condition than in either of the two other conditions, endorsing the creator, and not the original owner of the materials, as the owner of the final product. Children were least likely to transfer ownership in the possession condition. Further experiments in this series showed the time spent manipulating the clay had no effect on who the children chose as the owner after the transformations had taken place. In this case, children still endorsed transfers of ownership in the creative-labour, but not the other two conditions. The experimenters then tested whether the transfer of ownership was due to the fact that in the creative-labour condition the identity of the clay was changed, e.g. what began as a clay duck turned into a clay rabbit. In one condition the identity of the animal was changed, and in the other condition the clay was changed but maintained its identity, e.g. a duck was transformed into a duck. Whilst the endorsement of ownership transfers did decrease by 20% when the clay retained its identity, children transferred ownership in both conditions significantly more than in the possession condition of experiment 2. It can then be concluded that, in situations in which creative labour occurs, children reason similarly to some property law theorists, acknowledging the labourer as having some ownership rights in regard to the object. The results of these studies must be viewed in light of the fact that children may have been willing to reward creative labour with a transference of ownership because they were receiving clay in return, which could subsequently be reshaped to what they began with originally, and therefore they did not feel any real effect of losing their object through a transference of ownership. Children may have happily acknowledged transfers of ownership as the nature of the object they were transferring, and its ability to be re-moulded, meant that no real violation of children's property rights occurred.

Even with the evidence from this study, and the aforementioned study on control of permission, the question of exactly how children infer who owns an object

when creative labour is not involved, and when neither person is seen controlling an object, remains to be answered. For example suppose you see someone sitting on a bench with a newspaper next to them. It would make sense to assume this person owns the newspaper even though at the time you see them they are not physically controlling it, and you can infer that it is unlikely they invested any labour in its creation.

1.17: Theoretical Accounts Underpinning Ownership

One account that has been put forward as the theoretical framework upon which ownership decisions are made is that of visual association. Beggan and Brown (1994) claimed that an association between a person and an object is enough to justify the person's claim of ownership over it. In their study, students heard a story of a couple who were divorcing and deciding who got to keep the T.V and V.C.R. Students saw different pictures in each condition. In the no association condition, they saw the husband, wife and the objects in question on three separate pictures, with no visible associations between them. In the husband associated condition the husband appeared with the T.V. and V.C.R and the wife appeared alone in a separate picture, and vice versa for the wife associated condition. Students were then told the husband and wife were divorcing, that both enjoyed watching the T.V and they had decided the two objects should go together but they don't know who they should go to. After hearing the scenarios and viewing the pictures, students were asked to rate the ownership claims of the husband and wife. Results indicated that whoever was in the picture with the objects was voted as having a stronger ownership claim, in comparison to the character on their own. Beggan and Brown (1994) used these results, and results from two further studies to support their claim that the presence of

an association between a person and an object is enough to influence ownership decisions in adults.

A study on undergraduates (Friedman & Neary, 2009) refuted this association account, demonstrating that association may affect judgments of liking, but does not seem to influence ownership decisions. In this study two characters played with an object, but one character got to play with the toy for a long time and the other character had the toy for only a brief period of time. When asked to judge which character liked the toy more, participants chose the character who had played with the toy the longest, and therefore had the strongest association with it and liked it more, regardless of whether this character had played with the toy first or second. However, when asked which character owned the toy, participants chose the character that first possessed the object, even if this character had only played with the toy for a short time, thereby creating a weaker association with it.

Blake and Harris (2011) put forward a more complex association account of ownership, claiming that young children reason about ownership by creating visual associations between people and objects, deeming the first person seen intentionally possessing the object as its owner, having created a robust visual association between this person and the object. As a person gets older this is supplemented by language, but visual associations between people and objects remain a potent source of inference about ownership into adulthood. Blake and Harris put forward the suggestion that a basic way children identify unique people-object relationships is by physical association; a child sees their father with a briefcase every day, and will therefore associate his father with the briefcase. Of course children see their parents or caregivers touch many objects every day and to encode and keep track of all of these associations would be impossible. Blake and Harris purport that infants engage in selective tracking with their parents' help. For example, a child who points to their

mother's purse and says "mum" will inevitably receive positive feedback from their parent (yes that is mum's purse). If the child is incorrect then it follows that the parents would correct this child's mistake.

Intention is also an important part of this account of ownership. Some intentional action by the agent in relation to the object is, according to this account, necessary to establish an association. In Friedman and Neary's (2008) serial possession experiments, Blake and Harris (2011) propose it was not a first possessor heuristic children were using to infer who owned the object, but rather they were forming person-object associations when they viewed the character performing an intentional action on the object. They purport that a visual association will be formed between a character and an object if that character is performing an intentional action on the object. Once this initial visual association has been made it resists being overwritten by other subsequent visual associations. They also claim that despite inferences of ownership being made on visual associations, by the second half of the second year of life children refer to these associations even when the person and object are not in the same location at the same time. One explanation of how these visual associations are organised is the person-centric model, which describes owned objects as spokes connecting to a central person representation. The object and the person are distinct representations but the model centres on one person with connections to all of their possessions. Such a model would enable children to go beyond mere visual associations and, as long as they were able to hold a mental representation of a particular person and a particular object, the child could form an association between the two in a mental model. This model may be the way children organise their associations. However, as Blake and Harris, (2011) point out adults don't appear to use this kind of organisation in their associations, encoding owned objects by locations and events, rather than connecting them to people.

Furthermore adults generally assume that objects are owned even before they know who the owner is, and before they have a person representation to associate with the object. An alternative to this model is the object centred model which views objects as the central representation and owners as an attribute of the object. When infants see a person and an object together they encode a link from the object to the person, and that link to the person becomes an ownership attribute of the object (Blake & Harris, 2011). Whilst discussions continue over which of these models most parsimoniously explains the association account of ownership with a suggestion put forward that children begin with a person-centric model of association and move to an object-centred model, it is questionable whether association is indeed a feasible account of how children infer ownership. The first person seen possessing an object may not be its owner. They may be holding the object for the owner, or may have borrowed it for a specific purpose. However if a visual association is created between this character and the object, which resists being overwritten by a second visual association, this character will incorrectly be assumed to be the owner.

Another possible account of how children and adults infer ownership is by reconstructing the history of the object, and, if possible, taking into account the intentions of the people involved with the object (Friedman, Neary, Defeyter & Malcolm, 2011). For example, suppose you are in a coffee shop and you see a magazine lying on one of the tables close to where you are sitting. You want to read this magazine but whether you do will depend on whether you judge the magazine to be owned or not. If you see a woman sitting close to the magazine and you know she bought it, brought it to the shop, read it and then put it down next to her, the logical conclusion is that the magazine belongs to her. However, if she has finished reading it and has put it on the table with the intention of discarding it then it would make sense to think she no longer owns it. In this case it would be permissible for you to

take the magazine and read it. In everyday life we are rarely afforded with this much information about an object. However it is still possible to make ownership judgments when the history of the object is not available to us. In these situations, logical thinking can help us to reconstruct the history of the object in relation to people and their intentions. There are two different ownership judgments to be made based on whether the object is assumed to be owned or not. If you assume that the object is un-owned then, in a situation where one or more persons are taking steps to become the owner, the objective is to decide who owns the object. If you know the object is already owned then the aim is to discover who the owner is, information which may have existed for some time. This thesis is concerned with how children and adults infer ownership of artefacts, which are largely assumed to be owned. Therefore the aim in this case is discovering who the owner of an artefact is, rather than deciding whether or not an artefact is owned.

In certain situations it is crucial to assume that somebody owns an object. If you see your friend, Suzanne, holding an object such as a mobile phone you will most likely assume the phone belongs to her. If you didn't make this assumption then you may treat the object the same way as a discarded object, i.e. having no owner. If you truly believed this was the case you would not prevent a stranger from taking the phone if Suzanne, for example, put it down on a table. If Suzanne possessing the phone was not enough for you to attribute ownership of it to her it would cause problems if she offered you the phone as a gift, or if you wanted to buy it from her. If you don't assume she owns the phone then she has no right to transfer ownership of it either in exchange for money or as a gift. If people refused to accept ownership signals, such as possession, ownership could not operate in society as it would constantly be called into doubt. Possession in this case indicates that at some earlier point in time Suzanne obtained the phone in a way that meant she was the legitimate

owner of it. If you then discovered that Suzanne had just picked it up from a table you would most likely disregard your initial conclusion, and assume that the phone belongs to the person who possessed it before leaving it on the table that Suzanne picked it up from. This assumption of course rests on the premise that the person who originally had the phone had obtained it in a way that afforded them a legitimate claim of ownership. You would assume this person left the phone on the table by mistake, and never intended to abandon it. If they came back to claim their property you would expect Suzanne to willingly give it back, as her claim of ownership had never been legitimately established. In all these different scenarios, reasoning about ownership involves reconstructing the history of the object. Current possession (e.g. Suzanne possessing the phone) is used to infer ownership because it signals that the possessor had the object in the past, having obtained it at an earlier time.

In Friedman and Neary's (2008) serial possession studies, rather than directly inferring ownership from first possession, participants may have picked the first possessor as the owner of the object because the first possession of the character suggests that before the scenario began they had somehow acquired possession of this object in a way that legitimately granted them ownership of it. Suppose a girl is pictured possessing an object, followed by a boy subsequently possessing it. The girl's first possession indicates prior possession meaning that at some point before the story began she had acquired ownership of this object in a legitimate way. During the story there is no mention of a transfer of ownership through gift giving or buying, and therefore it can be assumed that the girl, who was seen possessing the object when the story began, is the owner of the object. The subsequent possession of the object by the boy provides no hints about ownership, as his possession does not suggest he possessed the object or acquired ownership of it prior to the story

beginning. An explanation of his possession may be that that the girl is allowing the boy to play with the object before returning it to her.

Reasoning about ownership based on this account requires people to take into consideration the visual information they see around them in certain scenarios. They must then go beyond this information and reconstruct the history of the object based on the information they have available to them. The ultimate goal is to discover who initially acquired the object in a way that legitimately grants ownership of it. Inferring ownership involves more than relying on a default assumption or rule that the first seen possessor of an object is its owner. Reasoning about ownership is more complex than forming an association between a person and an object. Whilst these associations may account for judgments about who likes an object more, or who wants an object more, according to this account they are not deciding factors in ownership judgments. The historical narrative account of ownership purports that people attempt to discover who originally owned the object by reconstructing the history of the object to ascertain who had prior possession of it. Unless there is evidence suggesting a subsequent legitimate transfer of ownership has taken place this prior possession is taken to be indicative of ownership.

Given the literature that has been reviewed it seems that ownership may be a complicated and multi-faceted construct, and not one that can easily be explained through a simple theory. Adults and children may take into account associations between people and objects, they may attempt to reconstruct the history of the object, or they may acknowledge a number of different situational cues which each provide them with information about who the owner of the object may be. Information such as who was seen first physically possessing the object may be enough to establish ownership, but at this point in time there is not enough unequivocal evidence to negate the possibility that children and adults may use other information which

overrides this simple cue. Factors such as whose room the object is in, whether the object is most appropriate for a girl or boy, or an adult or a child may also be important when making these decisions. At present there is no scientific evidence that children and adults take particular factors into account when making ownership decisions, or exactly what these factors may be, and therefore one of the aims of this thesis is to decipher which information is taken into account, by adults and children, when inferring who owns an object and how adults and children make ownership decisions.

The main aims of this thesis are to:-

- 1: Investigate the factors which are taken into account in ownership decisions,
- 2: Establish an account which may explain how both adults and children infer who owns an object.

Three main accounts of ownership will be considered throughout the experimental chapters of this thesis. The simple first possession account of ownership of Friedman & Neary, 2008, where ownership is directly inferred from first possession, will be assessed. The visual association account of ownership (Blake & Harris, 2011) in which an owner is the character with whom an initial visual association is created will also be reviewed. Finally the historical account of ownership (Friedman, Neary, Defeyter & Malcolm, 2011), which purports that the history of the object is reconstructed based on the available information, will be considered as to how well it can explain the findings from the forthcoming experiments.

Chapter 2: The Effect of Age and Gender Stereotypes on Ownership

Judgements.

2:1 Introduction

Previous studies investigating ownership have focused on relationships between particular individuals and particular objects (Friedman & Neary, 2008; Kangeisser, Gersoe & Hood, 2009; Noles & Keil, 2011). However information about kinds of people and objects can also be important and useful when making decisions about ownership. Different groups of people typically prefer and use different kinds of objects, for example a boy is more likely to play with a truck than a girl, and similarly an adult is more likely to use car keys than a young child. With this in mind it follows that different groups may differ in terms of the objects that they typically own. It is therefore plausible that children and adults may use this information when faced with ownership decisions involving kinds of objects and groups of people. It is important to establish whether adults and children do take stereotypes into account when making ownership judgments. If stereotypes are of no relevance to ownership decisions then objects do not need to be carefully selected in future studies. However if stereotypes do affect ownership judgments then care needs to be taken in future studies to make sure neutral objects are chosen, to prevent stereotypes unknowingly affecting results.

With this in mind the first study in this chapter investigates whether adults and children take information about gender stereotypes into account when making ownership decisions. The second study in this chapter investigates whether age stereotypes are also considered in ownership judgments. Before this, evidence that suggests children consider an object's kind when deciding whether it is owned or not will be reviewed. Evidence as to whether children are aware of group differences in

object use and preferences will then be examined, and finally existing research into whether adults and children use stereotypes in their ownership judgments will be considered.

2.1.1 Children's Use of Kind Based Judgments in Ownership Decisions

Evidence suggests that children appear to take an object's kind into account when judging whether an object is owned (Neary, Van de Vondervoort & Friedman, 2012). If children are sensitive to kinds of objects in these decisions they may also be able to acknowledge that certain kinds of objects may be preferred, and owned, by certain groups of people. In the study by Neary, Van de Vondervoort and Friedman, (2012) children aged 3 years-of-age were shown photos of objects including natural kinds and artefacts, and were asked if the object belonged to anyone. All the objects were set against a white background and were highly familiar and recognisable to children. Results showed that children judged artefacts as owned in 89% of judgments whereas natural kinds were judged as being owned only 28% of the time. The results demonstrated that children as young as 3 differentiate between familiar artefacts and natural kinds, viewing artefacts as generally owned, and inanimate natural kinds as generally not owned. In order to eliminate the prospect that children's judgments were based on prior experiences with the objects a second study was conducted in which children aged 3, 4, 5 and 6-years-of-age were shown pictures of unfamiliar artefacts and natural kinds. Children were shown pictures and asked to sort them into two buckets depending on whether or not they judged them to be owned. Children received a score of 1 if they placed the picture in the "owned" bucket and a score of 0 if they placed the item in the "non-owned" bucket. The scores of the 3-year-olds did not differ according to condition. At the age of 4 and 5 years-of-age children

mostly viewed natural kinds as not owned. However, whilst they judged artefacts as owned more often than natural kinds, their artefact scores did not differ from chance. The scores of the 6-year-olds showed that they viewed natural kinds as mostly not owned and viewed artefacts as owned, with scores higher than chance level. Despite this finding the results do demonstrate that children over 4-years-of-age view unfamiliar artefacts and natural kinds as distinctly different, and hold different expectations about whether or not they are owned. Whilst 3-year-olds did not show any difference in their ownership judgements of natural kinds and artefacts this may have been due to the memory demands of the task, rather than a reflection of their ownership reasoning. In the study children had to remember which bucket was for items that were owned, and which bucket was for items that were not owned. Children aged 3-years-of-age may have reasoned about ownership in a similar way to older children, however they were unable to simultaneously hold information about the ownership status of the object, in working memory, as well as remembering which bucket was for which type of artefact. They may have made ownership decisions similar to the older children but then chosen the wrong bucket to put the picture into. For this reason another experiment was conducted which involved a yes/no question rather than a picture sorting task. The same photos were used as in the previous experiment accompanied by a question of, "Does this belong to anyone?" Children were free to answer this question as they wished. Children received a score of 1 each time they claimed an object was owned and a score of 0 each time they judged it as not owned. Responses such as "maybe" or "I don't know" were interpreted as denials that the object was owned. Results revealed that artefacts were generally assumed to be owned more often than natural kinds, and that 3-year-olds made this distinction when the memory demands of the task were reduced and they could focus on the ownership decision. Other than the improved performance of 3-year-olds, which

brought their results to a level identical to that of 4 and 5-year-olds no other differences were found between these results and the results in the previous study, again demonstrating that it is not until 6-years of age that children view unfamiliar artefacts as owned.

In a third experiment Neary, Van de Vondervoort and Friedman (2012) showed children aged 3 and 4-years-of age pictures of unfamiliar natural kinds and artefacts, and gave them information about whether people do or do not make the objects. The children were then asked if the object belonged to anyone and also whether the object was liked by anyone. The results from the 3-year-olds showed no difference between liking judgments for natural kinds and artefacts. However there was a significant difference in the ownership judgements made by the 3-year-olds, with natural kinds mostly being viewed as not owned and artefacts mostly viewed as owned. The result from the 4-year-olds demonstrated that in both the liking and ownership condition, scores for artefacts were significantly higher than for natural kinds. However in the ownership condition there was a bigger difference between the scores, with 4-year-olds mostly viewing natural kinds as not owned and artefacts as owned. What was evident in this study was that both 3 and 4 year olds endorsed artefacts as owned, and natural kinds as not owned at rates higher than chance, something which was not observed in the previous experiments with children in this age group. A final experiment with 4 and 5-year-olds ruled out the possibility that children were endorsing artefacts as owned simply because the objects themselves were more desirable than the natural kinds. The results from the aforementioned study demonstrate that children are aware that there are different kinds of object and consider an object's kind when deciding whether or not an object is owned.

2.1.2 Children's Knowledge of Group Differences

Evidence also exists which suggests children are aware of group differences in age and gender. In a study by Levy and Haaf (1994) 10-month-old infants were habituated to two categories of pictures. Each category contained pictures of either a male face or a female face paired with an object associated with that face; for example a female face with a hair dryer and a male face with a hammer. Once infants were habituated to these stimuli they were presented with four test stimuli consisting of a control test stimuli, which was a pair from the habituation set, a generalized test stimuli, which maintained the pattern of features which had been established in the habituation set, a novel test stimuli, consisting of a person object pair which violated the pattern to which infants had been habituated, and a unique test stimuli, which was a picture unrelated to the habituation stimuli. Results showed that, even though infants had not seen the generalized test stimuli before, they did not view it as any more novel than the habituation stimuli, which they had viewed before the test began. However the novel stimuli, which violated the expectations of the sex-based association infants had built up, was treated as no less novel than the unique stimulus, which was entirely unrelated to anything the infants had seen previously in the study. The results were interpreted to indicate that infants at this age are able to detect correlations in social information, and can use this information to form gender-related categories. Rather than 10-month-olds already having formed gender-related categories the authors focused on the results as a demonstration of infants' ability to organise social information into gender-related categories, which could be a precursor to the procurement of gender typed categories at a later stage. Results from this study demonstrate that from a very young age children are able to organise information into gender related categories. It is therefore plausible that as young

children continue to develop their understanding that different groups exist, and these different groups stereotypically prefer different kinds of objects, this knowledge may affect their decisions, actions and preferences and potentially their ownership judgments.

Research has shown that children's knowledge of gender stereotypes can affect how well they perform in a game. A study by Montemayor (1974) demonstrated that even young children are aware of group differences, and do not want to play with toys which are labelled for the other gender. In this study girls and boys aged 6-8 years-of-age were divided into three conditions; neutral, boy condition and girl condition. They were then asked to play with a gender neutral toy (Mr Munchie), which involved throwing marbles into "Mr Munchie's" body before the time was up. Children were assigned to one of three conditions, and depending upon which condition they were in they were told that the toy was for boys, for girls or just a toy. After the children had played with the toy it was removed and the children were asked to rate the toy's attractiveness by indicating where they would place the toy on a line of attractiveness, ranging from the worst in the world to the best in the world. The children were also asked to answer questions such as, "If you owned Mr Munchie would you play with him?" If the child answered "yes" the next questions would ascertain how much that child thought they would play with the toy. A performance measure was also recorded which consisted of how many marbles each child threw into the toy in the allotted time. Results showed that males performed better when they were told the toy was for boys than when they were told it was for girls. However the neutral condition was not significantly different from either of the two other conditions. Girls performed better in the girl condition than the boy and neutral condition, with no significant differences between these two conditions. In terms of attractiveness boys judged the toy as more attractive in both the boy and neutral

conditions than in the girl condition. Girls similarly judged the toy to be more attractive in the condition which matched their gender, and in the neutral condition. The boy condition received the lowest attractiveness ratings from the girls. Results showed that performance levels of boys and girls were better when they were playing a game which they had been told was for their gender or “group.” Results also showed that labelling a toy as for another group reduced the attractiveness of it. Despite the fact that children were not being asked which group would prefer the object, but rather asked about their own preferences, the results do still reveal that children are aware of group differences, and are more attracted to things which are labelled as for their group. Children may find most toys attractive by default. However when a child is told that a specific toy is for a different group or sex, their rating of attractiveness of the toy diminishes.

A study by Bradbard and Endsley (1983) also showed that young children are aware that different toys are for different groups of people, and when told a toy is not for their gender group, will actively avoid playing with it, and remember less about it, compared with a toy which they are told is for their gender. In this study children aged between 5 and 6-years-of-age were shown novel objects along with 3 boxes. One box had a picture of a boy and was labelled “boys.” One had a picture of a girl and was labelled “girls.” The final box was labelled “boys and girls,” and was decorated with pictures of both boys and girls. The experimenter explained each box to the child telling them, “This is a box for boys/girls/both; it has a picture of a boy/girl/both and boys/girls/both like the things that are in the box.” Children were told to remember the names of the objects as they were informed they would be asked about them the next day. Children were then told they could play with and ask questions about any of the toys. Results showed that both boys and girls explored objects which were labelled as being for their own sex significantly more than objects labelled for the other sex.

Objects which had been labelled as for both sexes were explored more than objects labelled for the opposite sex, but less than objects labelled for their own sex. Both boys and girls actively sought out objects which were labelled as for their sex, and actively avoided objects which were labelled as for the other sex. One day, and then one week later, children were tested to see if they could remember the names of the novel objects. Before being asked to recall the names of the objects children were shown the objects they had seen previously, along with other objects which they had not been shown before. Children were asked to state whether they had seen the object before, and which sex it had been labelled for when they saw it. Only 5 out of the 36 children tested made any mistakes when judging whether they had seen the object before, and the children classified the objects correctly 80% of the time in relation to which sex or sexes the objects had been labelled for. When it came to remembering the names of the objects however differences were apparent. Children recalled the names of objects more often if the objects were labelled for their own sex, rather than for the other sex. The names of objects which were labelled as being for both sexes were recalled more than other sex labelled objects, but significantly less than same sex labelled objects. The aforementioned studies indicate that children are not only aware that group differences exist, but also identify with their gender group, avoiding toys labelled as for the other gender.

Shutts, Banaji and Spelke (2010) showed that children also identify with members in their group with whom they have common preferences. Children prefer objects endorsed by someone in their own gender-or-age group, over someone in the opposite gender-or-age group. In this experiment 3-year-olds were shown pictures of novel objects on a computer. An object appeared on the screen accompanied by a picture of either a male or female child. The child then heard a child's voice, which matched the gender of the child in the photograph, endorsing the object and

expressing their liking for it. For example the child saw a photograph of a female child endorsing a particular object. They then saw a male child endorsing a different object. Following this the child saw both photographs and both objects on screen and was asked to choose which object they would rather play with. Children were given neutral feedback on their decisions and care was taken to never label the gender of the child in the photograph. Results showed that children aged 3 preferred novel objects endorsed by a member of the same gender even when the gender categories were never explicitly labelled. In a second experiment involving a different set of participants the authors aimed to replicate the gender effect, and also ascertain whether children preferred endorsements by same-age peers or by adults. The gender effect was replicated, with children again choosing objects endorsed by their gender rather than the opposite gender. The results from the age aspect of the study showed that children preferred objects endorsed by a child of their own age rather than an adult. What is interesting about these results is that children could have made decisions about which object they would rather play with based on how attractive they found the object itself. However children seemingly ignored this aspect of the object, preferring rather to take into account the endorsements of those in a similar group to themselves in both age and gender.

A study by Martin, Eisenbud and Rose (1995) further showed that children understand that members of a group will often like the same kinds of objects. Children not only make their decisions based on what they see other children endorsing, but also predict what other children will like based on their opinions of particular objects. In this study children aged 4-5-years-of-age were shown unfamiliar objects, such as a metal nail sculpture, and were given a short amount of time to explore the object. Following this the experimenter asked the child to rate how much they liked the toy. The child expressed their like or dislike by pointing to one of four cups, differing in

height, and ranging from the tallest which stood for like a lot, to the shortest which meant like a little bit. The child was then asked to rate how much they thought girls would like to play with the object, and how much they thought boys would like to play with it. Results showed that children based their predictions of how much other children would like the toys on how much they like them, and the gender of the other child in question. For example if a girl liked a toy she predicted that other girls, members of her gender group, would like it, but that other boys, not members of her gender group, would not.

A further study investigated the attractiveness of the toy, and whether children would use gender-based reasoning to make decisions about unattractive toys. Unfamiliar non sex typed objects were used in this study, and the procedure was identical to study 1, with the same rating scale being used. Children were shown attractive and less attractive objects and asked to rate how much they and other children would like them. Results indicated that when children liked a toy they predicted that other children of the same gender would also like the toy. The attractiveness of the objects did not significantly affect the children's predictions. Even when toys were not attractive, children predicted that their own gender groups would like the same objects that they like, and the other gender group would like them less. Further analysis showed that children expect others in their gender group to like the same objects they do more than they expect children in the other gender group to dislike them. A preliminary examination of the judgments and predictions of undergraduates was also undertaken in order to make comparisons between children's response patterns and those of adults. Adults were only asked to rate one object, a magnetic sculpture, which was labelled an "adult toy." Even though only one toy was rated, the responses of adults were similar to those of the children, with both men and women predicting that if they liked an object other members of their gender

group would also like it, and members of the other gender group would like it less. The final study examined how children made preference judgments for themselves and others when the objects were given explicit gender labels, something which was not present in Studies 1 and 2. The attractiveness of the toys was also varied to ascertain whether the effect of gender labels rendered even an attractive toy undesirable if it was labelled as for the other sex, or whether gender information may be disregarded if a child found a toy, labelled for the opposite sex, extremely attractive. If children use gender labels as a basis for their decisions then their own preferences, and their judgments of how much other children would like the toys, should be guided by the labelling of the toy, rather than the attractiveness of it. In this study an experimenter showed children novel toys varying in attractiveness. The toys were then named by the experimenter and then labelled “for boys”, “for girls” or given no label. After each toy had been shown to the children they were given 30 seconds to inspect it. When the children had seen all the toys the first experimenter left the room and a second experimenter entered. Experimenter 2 then asked the children to rate how much they liked the toy, how much other boys would like the toy and how much other girls would like the toy.

In regards to their own personal preferences results showed that children preferred toys which were labelled as being for their own sex more than toys labelled as being for the other sex. The attractiveness of the toys also had an effect, with children preferring more attractive toys when the toys were labelled as for their sex, or not labelled. However when the toys were labelled as for the other sex the “hot-potato” effect was observed, with children avoiding even attractive toys if they were labelled as being for the other sex. When it came to predicting what other children would like, attractiveness of the toy and gender label both influenced decisions. Children predicted that other children would like more attractive toys compared to less

attractive toys, and would like toys labelled for their own sex more than toys labelled for the other sex. When predicting how much other children would like the toys, attractiveness of the toy did not have as much of an influence as gender labels. Children claimed that others would like attractive toys more only if they were labelled as being for their own sex. If they were labelled as being for the other sex, children focused more strongly on the label given to the toy. If the toy was labelled as being for the other sex, children predicted that other children of their sex would not like the toy.

The results of this study demonstrate that children, even when given the option to play with very interesting and attractive toys, lose interest in the toy if it is labelled as being for the opposite sex. The results also show that they expect other children to act in the same way that they do, predicting that children of the same sex as themselves will show the same preferences they do. Despite only having preliminary data for undergraduates the results from their study suggests that adults reason in the same way as the children, suggesting that from a young age children develop an understanding of groups and group stereotypes, which continues through to adulthood. The authors suggest that, when deciding which toy they and other children will like, children use a gender centric pattern based on the group which they belong to. For example a child, when confronted with an unfamiliar object or toy, will consider if they like the toy or not. If they like the toy they will assume that other children of the same gender will like the toy, and children of the opposite gender will not like it. If they do not like the toy they assume that children of their gender will also dislike the toy, but that members of the other gender will like it. Martin Eisenbud and Rose (1995) also purported that the results suggested that children and adults have beliefs about gender categories or groups, based on abstract theories about gender, which extends beyond the information they are presented with. They claim that both children and

adults may work on a theory of group differences i.e. what one gender likes the other gender won't, and group similarity i.e. what someone of one gender likes other members of that gender will also like. This evidence demonstrates again that from a young age children are very aware that people belong to different groups, and those different groups like different things.

The aforementioned studies demonstrate that children understand that different groups of people prefer different things. They identify with people in the same groups as them, whether it is based on gender or on age, and prefer an object endorsed by a member of a group they identify with. They also make predictions about people in the same or different groups as themselves. However in these studies children were being shown unfamiliar toys, or being shown toys and explicitly told whether they were for boys or for girls. Research also shows that children know certain familiar toys are preferred by girls, and certain others are preferred by boys. They also know that some traits and activities are masculine and some are feminine.

A study by Kuhn, Nash and Bruken (1978) demonstrated that from as young as 2 years-of-age children are aware of sex role stereotypes, identify with their stereotype, and have knowledge of aspects of the stereotypes of the opposite sex. In this study children between the ages of 2 and 4 years-of-age were given a paper doll of a boy, and a paper doll of a girl. They were then shown pictures of stereotypical boys' and girls' activities and heard a sentence about the picture. For example they were shown a picture of a doll and a doll house and heard a sentence which said "I like to play dolls." Children were then asked to place the appropriate paper doll in the picture depending on who they thought was more likely to say the phrase and carry out the activity. In a subsequent session children heard the sentence describing a particular trait, but were not shown the pictures, and were asked to decide which of the paper dolls was more likely to have said the sentence. Children in following

sessions were also asked which doll they were most like, and which doll they would most like to be like. In the final session children were asked questions about their gender constancy such as, in the future will you be a boy or a girl etc.

Results demonstrated that both boys and girls held some similar views about the traits and interests of the other gender, and also disagreed about some others. They both thought boys liked to play with cars and liked to build things, and girls like to play with dolls, like to cook and like to clean the house. In terms of future roles both boys and girls believed that when boys grow up they will mow the grass and be the boss, and when girls grow up they will be a teacher and will take care of babies. In response to questions about which doll they were most like most of the boys and girls identified with their own sex, and knew that they would remain the same gender in the future. Girls believed some negative things about boys which boys did not agree with, for instance boys are mean and weak. Similarly boys believed some negative things about girls which girls did not agree with such as girls are slow and cry. Girls and boys also believed some positive things about their gender, beliefs which the opposite gender did not share. In general the beliefs held in common by both sexes related to play activities rather than characteristics about that sex.

Children in general agreed about which toys boys would play with and which toys girls would play with. In this experiment children were not explicitly told that any of the toys or activities were for one gender or another but were left to make up their own mind based on the pre-existing stereotypes they had already acquired by this young age. Results showed that by 2-years-old children are aware that different people fit into different groups, and those different groups will prefer different things. The results also demonstrated that most children are aware that gender identity is a permanent and irreversible characteristic.

Edelbrock and Sugawara (1978) also carried out a study where children were not explicitly told which gender an activity or an object was for. Children aged 3-5 years-of-age were split into two groups; a younger group and an older group. Children were shown a range of pictures of objects, child figures and adult figures. Children were first shown pictures of objects such as an iron and a hammer. The pictures contained no figures of either sex in them. Children were shown the pictures and asked who would use the object to complete a certain action. For example who would use a hammer to hammer nails? The children could choose boys, girls, or both boys and girls. The child made their decision by placing the card in the box labelled for boys, for girls or for both boys and girls. Once all the cards had been placed in the boxes the experimenter removed the both boys and girls box and asked the children to decide whether the pictures they had previously placed in the “for both boys and girls” box were “for boys” or “for girls.” The child was then shown the child figures section depicting a figure the same gender as the child doing different activities such as boxing or ironing. The child had to decide which activity they would like to do best. This card was then removed and the pattern repeated until there were no pictures left. The final pictures were of the adult figures such as fire fighters and teachers. Children were asked which one of the things they would like to be when they grew up. This question was asked for every picture until there were no pictures remaining.

Results showed that older children were more aware of sex role stereotypes than younger children, and both older and younger children were more aware of their sex-role stereotypes than the sex role stereotypes of the opposite gender. The girls’ scores however demonstrated that they were more aware of the masculine role than boys were aware of the feminine role. Children also showed a preference to adhere to their sex stereotypes when choosing what they would like to be like in the future. Girls scored higher than boys in the adult section, whereas boys scored higher than girls in

the child section, suggesting that girls are more aware of what is expected of their gender stereotype in adulthood in comparison to boys, who are more influenced by their stereotype in the present.

These results give more support to the idea that children are aware of group differences from a young age. They identify with their gender group and want to adhere to the stereotypes of that group. They also demonstrate an awareness that stereotypes continue into adulthood and are eager to uphold the stereotypes of their gender. Despite the fact these results showed that older children are more aware of sex role stereotypes than younger children this does not mean younger children are oblivious of gender stereotypes, as was shown in the aforementioned study of Kuhn, Nash and Bruken (1978), in which children as young as 2-years-old demonstrated an awareness of sex role stereotypes, and a desire to adhere to them. It follows that at a young age children are more aware of their own stereotypes than the stereotypes of the other gender. It is likely that as children are developing their understanding of gender stereotypes they will be more concerned with what the stereotypes of their group are, rather than what the stereotypes of the opposite group are. Overall however these results support the fact that children not only seek to conform to their gender stereotypes when explicitly told what they are, but that children are aware of gender stereotypes both for children and adults, and desire to be part of their gender group, and adhere to their gender stereotypes.

Martin and Little's (1990) research also supports the findings that children have an understanding of gender stereotypes, and a desire to adhere to them. In their study children aged 3-5 were tested on aspects of gender stereotypes including gender discrimination, where children were shown a target picture of a man, woman, boy or girl. They were then asked to pick out the picture that was most like the target picture from a possible eight other pictures. Children were also tested on group

membership, which involved a child choosing whether a picture of a boy or girl was most similar to them. Also tested were gender labelling, where children were shown pairs of pictures of a boy and girl and asked to point to each in turn, gender stability, asking questions about whether the child thinks they will be the same gender when they grow up, and gender consistency, asking children whether they would be a boy or girl if they wore clothes meant for the opposite sex. Children's knowledge of gender stereotypes in relation to toy preference and clothing were also tested, which involved children choosing which items of clothes, stereotyped for boys or girls, went with which person; a boy, a girl or both a boy and a girl. The toy preference test worked in the same way but toys stereotyped as being for boys and girls were used instead of clothes. Children also rated how much they themselves would like to play with different stereotyped toys. Children were also tested on their preference for novel toys. Children were told the toys were something "girls really like", "boys really like" or "both boys and girls" really like. They were then asked to indicate how much they liked them. Finally children were tested on their peer preference. They were shown 3 pictures of boys, one playing with a masculine toy, one a feminine one, and one a neutral one, or 3 pictures of girls in the same vein. Children had to rate how much they would like to play with each boy and girl. The results from all these tests indicated that children identify with their gender group and prefer same sex toys, novel objects and peers.

The results showed that as children get older their understanding of gender stereotypes increases and understanding of gender consistency and gender stability are also furthered. However children need only a very basic understanding of gender in order for their preferences and knowledge to be affected. This research suggests that once children can accurately label the sexes their gender stereotypes begin to form, and this in turn influences their behaviour in a variety of different ways. No

children demonstrated an acquisition of sex-typed preferences but an inability to label the sexes, showing a definite pattern in the attainment of this knowledge.

A further study by Martin, Wood and Little (1990) supported the theory that as children get older their understanding of gender stereotypes increases. In this study children aged 3 – 6 years-of-age were asked to make stereotypic predictions about other children. In the first instance children were told the gender of the child and told this child had a best friend of the opposite sex, and an interest in a toy stereotypically associated with the opposite gender. For example “Jason’s best friend is a girl. Jason likes to play make up kits.” Children then had to rate how much the target child would like two toys consistent with the gender stereotype of the child in the story, and two toys inconsistent with the child in the story. Results showed that in this case children based their inferences on the gender labels, rather than the toy interests which they were informed the child had. The children predicted that the child in the story would prefer toys consistent with their gender, rather than toys consistent with the opposite gender. In a subsequent testing session the gender labels were removed from the stories and children were only told the interest of the child, for example children were told that a child really liked to play with dolls. They were then subsequently asked whether that child would like to play with 5 toys, 2 of which were sex-typed for boys and 2 of which were sex-typed for girls. The toy from the story was the 5th toy. The results from this study indicated that children made some of their judgements based on gender stereotypes but that they did not do this consistently. Their responses showed that when the target child had interests which were similar to their own, for example a female child assessing the preferences of a female, children used stereotypes when making their decisions. However when the target child’s interests were different to their own, they did not consistently base their decisions on gender stereotypes. It seems that if children are not told the gender of the child they do not

use gender labels to guide their decisions in all cases. The authors suggested the results could be down to the age of the participants, and the fact that children develop their stereotypic knowledge as they get older. A subsequent experiment confirmed Martin, Wood and Little's (1990) theory that children's knowledge of stereotypes develops over time. In this experiment 6-year-olds only made consistent stereotypic judgments when given same-sex cues, whereas 8–10 year-olds made stereotypic judgments even when the interests they were judging were stereotypically feminine.

The results from the aforementioned study are similar to those of Martin and Little (1990), who found that knowledge and understanding of gender stereotypes increases as children get older. It follows that children learn about their gender first, and the activities that are stereotyped with their gender, as they are encouraged to take part in these stereotypic activities and play with stereotypic toys from a very young age. Martin and Halverson (1981) put forward the idea that children learn more information about their own stereotypes first and as they get older they acquire information about other-sex stereotypes. Martin, Wood and Little (1990) concluded that children pass through three stages of understanding in relation to gender stereotypes, from learning direct associations such as "boys play with cars" through developing more complex associations relative to their own sex, and to finally learning associations relevant to the opposite sex.

The results from all the previously mentioned studies demonstrate that children's knowledge about gender associations begins at 10 months of age, with gender object associations at this age possibly being a precursor to the acquisition of gender categories at a later stage (Levy & Haaf, 1994). Research also demonstrates that young children are aware of belonging to, and identifying with, a group based on gender and age, preferring objects endorsed by someone from their group, rather than a different group to which they did not belong (Shutts, Banaji & Spelke, 2010).

Young children recognise people can belong to different social groups, and these people will share common interests and preferences. Children perform better at games labelled for their gender (Montemayor, 1974), prefer objects labelled for their gender, and expect others in their group to prefer the same objects they do (Martin, Eisenbud & Rose, 1995). Young children are also aware of sex role stereotypes, and can identify which actions they feel are associated with their gender group, and which are associated with the other gender group (Kuhn, Nash & Bruken, 1978). The preliminary data collected by Martin, Eisenbud and Rose (1995) also suggests that gender stereotyping remains salient into adulthood.

2.1.3 The Role of Stereotypes in Ownership Decisions

In everyday life when faced with decisions of ownership, where the owner of an object is unknown, and there is relatively little information to guide an ownership decision, it is possible to use characteristics of the object to inform judgements. For example if the object is a doll the most likely option is that the doll belongs to a girl. Therefore in an attempt to return the item to its owner the search would be narrowed to girls as, based on knowledge of gender stereotypes, it would be deemed unlikely that the doll would belong to a boy. If gender stereotypes are important in everyday life it follows that they would be taken into account in ownership decisions. A simple way of testing whether adults and children use group stereotypes in ownership decisions would be to merely ask participants to decide who owns a strongly stereotyped object such as a football. In this case however participants may work only on the basis of stereotypical associations rather than considering ownership. With no other information to guide ownership decisions participants may reason that they don't really know the answer, but stereotypically boys like footballs more, so they will

choose the boy as the owner of the object. One previous experiment which investigated the role of gender stereotypes in ownership judgments was that of Friedman (2008) in which gender stereotypes were pitted against first possession. Pitting first possession against stereotypes removes the possibility of decisions being based on stereotypical associations alone, with no thought of ownership. Giving participants information about who possessed the object first provides them with an alternative source of information upon which to base ownership decisions, and ensures that the ownership question is being considered. This rules out the possibility that stereotype information is only guiding decisions in the absence of anything else.

In this study (Friedman, 2008) adults participated in a series of serial possession studies, where one character possesses an object, followed by a second character possessing it. Adults are then asked to decide who owns the object. In these types of studies previous results have shown that, when there is no competing information, ownership decisions are based on first possession, (Friedman & Neary, 2008). In the stereotype studies Friedman (2008) showed adults stories of boys and girls playing with a ball and a teddy bear. In some of the stories the first possessor matched the gender stereotype of the object, e.g. a girl as the first possessor of the teddy bear. However in other stories first possession and gender stereotypes were in conflict, e.g. a boy as the first possessor playing with the teddy bear. Results showed that even though adults relied on gender stereotypes when making judgments of who liked the object more, their ownership decisions were based on first possession, even if the first possessor was in conflict with the gender stereotype of the object. One explanation for this finding is that the first possessor bias overrides many other factors, including gender stereotypes, therefore when first possession is pitted against gender stereotypes first possession wins. However an alternative explanation for their findings is that the objects were weakly stereotyped and were seen more as neutral

toys. Thus they provided no competition to the choice of the first possessor as the owner of the object. Evidence to support this proposal can be found in a study by Campenni (1999) in which parents and non-parents were asked to rate a number of different toys in terms of how appropriate they were for children of both sexes. The ratings ranged from “1 – only appropriate for girls” to “9 – only appropriate for boys” with “5 - equally appropriate for both boys and girls.” The results of these ratings showed that a teddy scored 4.78 deeming it equally appropriate for boys and girls. A generic ball was not on the list however a soccer ball scored 5.19 meaning this item also fell into the classification of equally appropriate for both boys and girls. Given these results it seems more likely that Friedman’s study (2008) was not actually pitting first possession against gender stereotypes, rather just ascertaining how ownership decisions are made when there is little other information than who possessed the object first. Findings from Friedman (2008) showed that adults view ownership decisions as being different from decisions of who likes an object more. This finding is important as it indicates that when faced with ownership decisions adults consider the evidence they are presented with about who has the most legitimate claim of ownership, rather than merely who may have a greater liking for the object. It is important to establish that in these types of serial possession studies children are also considering the evidence pertaining to ownership, rather than merely choosing, as the owner, the character who they think likes an object more.

A initial experiment by Malcolm, Defeyter and Friedman, (2012) also tested whether children viewed ownership decisions as different from liking decisions, or whether children attribute ownership to the character they think likes an object more. Adults and children were shown four serial possession stories where one character played with a familiar object, followed by the other character. The final page of the story showed the characters standing side by side with the object between them.

After reading two of the stories participants were asked, “Who likes the [insert object name]?” and after reading the other two stories participants were asked “Who owns the [insert object name]?” The results demonstrated that participants were more likely to choose the first possessor in the ownership condition, but not in the liking condition. It seems that the first possession bias is specifically related to decisions of ownership. First possession is strongly taken into account when making ownership decisions, but does not have the same influence on liking decisions. This shows that ownership decisions for both children and adults are different from the judgements they make about who likes an object more. The full details of this experiment can be found in Appendix 7.2.

2.1.4 The Current Experiments

In the experiments in this chapter first possession was pitted against gender and age stereotypes in order to ascertain whether Friedman’s (2008) results may have been due to weakly stereotyped items, or whether in fact the first possession bias is stronger than other cues of ownership. This was done in order to rule out the possibility that participants were merely choosing the gender or the age of the participants who they thought were most strongly associated with the object (e.g. boys like footballs and therefore are more likely to own the football), as previously outlined in more detail. Based on the research reviewed in this chapter, indicating the strength of gender stereotypes, and the effect they have on children and adults, it was hypothesised that, when objects which were strongly gender stereotyped were pitted against first possession, both adults and children would base their ownership judgements on the stereotype of the object, rather than who possessed it first. When pitting age stereotypes against first possession, despite the fact they are not as

prevalent as gender stereotypes, it was hypothesised that adults and children would base their ownership judgements on the age stereotypes, and not on the first possessor of the object.

2.2 Method

2.2.1 Design

The experiment followed a 2x2 between subjects factorial design. Factor 1 was Age which had two levels; adults and children. Factor 2 was Condition which included 2 levels, gender stereotype matches first possession (match) and gender stereotype is in conflict with first possession (conflict). The dependent variable was whether the first or second possessor of the object was chosen as its owner.

2.2.2 Participants

Forty adults aged 18-60 years and 30 children between the ages of 3 and 4 years participated in this study. Adults were recruited from Northumbria University and were predominantly white middle class. Children were recruited from primary schools in the North East of England serving mainly white middle class backgrounds. This age group was chosen for different reasons. Despite the fact that Kuhn Nash and Brucken (1978) showed that children are aware of gender stereotypes from the age of 2, Friedman and Neary (2008) demonstrated that at this age children's ownership judgements can be affected by factors such as the end position of the object in serial possession stories. Children aged 3-4-years-of-age are not affected by factors such as this, reliably selecting the first possessor as the owner of the object in

the aforementioned study. It therefore follows to use this age group in this experiment, when pitting stereotypes against first possession. The results obtained from the 3 and 4 year olds are more likely to reflect whether gender stereotypes are taken into account in ownership decisions, rather than being based on a factor irrelevant to the study, such as the end position of an object, as is the case with 2-year-olds.

Participants were randomly assigned to one of two conditions, according to age. In the match condition there were 20 adults; 4 male and 16 female (M = 21 years; range 18 years - 42 years) and 15 children; 6 male and 9 female (M = 3 years 5 months; range 3 years - 4 years). In the conflict condition there were 20 adults; 5 male and 15 female (M = 26 years; range 18 years – 60 years) and 15 children; 6 male and 9 female (M = 3 years 7 months, range 3 years – 4 years 2 months).

Table 2.1 Number of participants (by age group & gender) for the match and conflict conditions.

Condition	Adults		Children	
	Male	Female	Male	Female
Match	4	16	6	9
Conflict	5	15	6	9

Ethical approval was granted by the Northumbria School of Life Sciences Ethics Committee. Written informed consent was obtained from the adult participants (see Appendix 2&3) before any testing took place. Prior to the commencement of any testing of child participants at primary schools the head teacher consented to the

experiment taking place (see Appendix 1). Written, informed consent was also obtained from the parents of the participating children (see Appendix 2 & 3), and on the day of testing if the child seemed uncomfortable, or said they did not wish to take part, and did not give their verbal consent, they were not involved in the study. Children were given child friendly pens and pencils for taking part and the staff at the school were given boxes of chocolate as a token of thanks. Adults were debriefed immediately after the experiment. Children were verbally debriefed and thanked for taking part, and debriefs were given to parents when they came to collect their children (see Appendix 4).

2.2.3 Materials

Adults and children read four “ownership” stories, (see Appendix 5.1 for examples of all stories). Each story was about a boy and a girl and a different gender typed everyday object; a toy truck, a jewellery box, football equipment and a doll (with this order used, or its reverse). These objects were chosen as they were deemed to be highly stereotyped for one sex of the other. In the previously mentioned study by Campenni (1999) adults were asked to rate a large variety of toys based on their appropriateness for each gender. Scores were given from 1 which was only appropriate for girls, to 9 – only appropriate for boys. A jewellery box and a baby doll were rated as being appropriate for girls with scores of 2.02 and 2.58 respectively. The football equipment was given the highest rating in the study with a score of 7.46 and the truck was given a score of 6.91, making these toys appropriate for boys, but less strongly stereotyped than the feminine objects. Everyday objects were also used in the current experiment as previous research has shown that children under 6 years do not reliably view unfamiliar artefacts as being owned (Neary, Van de Vondervoort

& Friedman, 2012). Everyday objects were also used as children would most likely be unaware of the gender stereotypes associated with objects they had never seen before. Each story consisted of three pages set against a plain white background. The first page showed one character possessing the object. The text underneath the character explained that the child was playing with the toy and liked doing so (e.g. "Emily is playing with the jewellery box. Emily likes playing with the jewellery box"). The next page showed the other character possessing the object with the accompanying text explaining that this child was also playing with the object and enjoying it, (e.g. "Charlie is playing with the jewellery box, Charlie likes playing with the jewellery box."). On the final page the characters were shown standing side by side with the object between them. The gender of the first possessor, and whether the boy or girl was to the left of the object in the final picture in all four stories was counterbalanced across participants. In the condition where first possession and gender stereotypes matched the object was possessed first by the character consistent with the gender stereotype of the object, and then by the character inconsistent with the gender stereotype. In the condition where gender stereotypes were in conflict with first possession the character that first possessed the object was inconsistent with the stereotype of the object. Following this the object was possessed by the character consistent with the gender stereotype of the object, (see Figure 2.1 for an example of the condition where gender stereotypes match first possession)



Figure 2.1 Example stimuli used in the match condition of the gender study

2.2.4 Procedure

In each of the two conditions adults and children received 4 trials. Adults were tested individually in a quiet room in the Cognition and Communication laboratory in Northumbria University. Adults were given the story booklets and answer sheets and were left alone to read the stories and complete the answer booklets (see Appendix 6 for example answer booklet). Children were tested in a quiet corner of their classrooms or in adjoining rooms. The words were printed on the stories but given the age of the children they were read out to them. The children were also monitored to make sure they were engaging with the story. In both conditions each page was shown to the child, and the accompanying text was read out. When the final page of the story was reached the child was asked “whose is the (insert object name)?” If the child said “I don’t know” or did not answer they were recycled through the story and asked the ownership question again. If after the second time of asking the child still failed to give an answer they were moved onto the next story. No children failed to give an answer after the first time of asking. If adults and children use stereotype information to make ownership decisions and weigh this information more strongly than first possession then the boy should be chosen as the owner of masculine items

and the girl should be chosen as the owner of feminine items, regardless of who possessed the object first.

2.3 Results

In each condition, for each story, participants received a score of 1 each time they made ownership decisions consistent with gender stereotypes, and a score of 0 each time their decisions were inconsistent with gender stereotypes (maximum score 4). All children answered the ownership questions therefore all children were included in the analysis. Two adults in the conflict condition gave other responses such as “I don’t know” or “both” and as such were excluded from analysis. The mean number of endorsements in line with gender stereotypes by adults and children is shown in Figure 2.2.

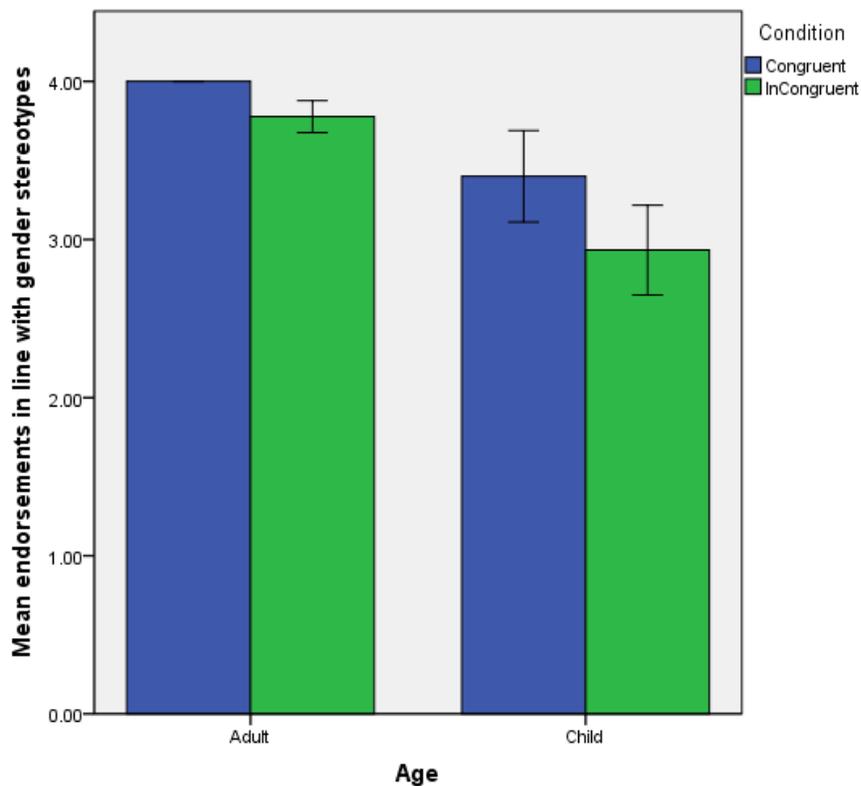


Figure 2.2 Mean endorsements in line with gender stereotypes in the match and conflict conditions.

An initial analysis of variance (ANOVA) was conducted, which included the gender of the participants as a factor. There was no main effect of the gender of the participants and no interaction effects. Therefore the gender of the participants was not included in any further analysis.

The data from adults and children were then submitted to a 2 (age group: adults v 3-4 year-olds) x 2 (condition: match v conflict) ANOVA. The results revealed a main effect of age, $F(1, 64) = 14.64, p < .01$, with adults more likely to make ownership decisions in line with gender stereotypes than children (adults, $M = 3.89$; children, $M = 3.30$). There was also a main effect of condition, $F(1, 64) = 9.64, p < .01$, with participants more likely to base ownership decisions on gender stereotypes in the match condition compared to the conflict condition (match, $M = 3.86$; conflict, $M = 3.39$). The age x condition interaction was not significant, $F(1, 64) = 2.76, p = .1$.

The results of the adults and children were then analysed separately. A one way ANOVA demonstrated a significant main effect of condition in the results from the adults, $F(1, 36) = 5.414, p = .03$. Whilst adults made ownership decisions in line with gender stereotypes in both conditions they were more likely to base decisions on gender stereotypes when the stereotype matched first possession ($M = 4$), than when it was in conflict with first possession ($M = 3.77$). Further analysis showed that in the match condition 100% of adults responses were in line with gender stereotypes. In the conflict condition adults also based their ownership decisions on gender stereotypes at rates exceeding the chance score of 2, $t(17) = 17.63, p < .01$.

Similar results were observed with the children. A one way ANOVA revealed a significant main effect of condition, $F(1, 28) = 5.072, p = .03$. Like the adults the children made decisions in line with stereotypes more often when the stereotype matched first possession ($M = 3.66$), in contrast to when stereotypes were in conflict

with first possession. ($M = 2.93$). Children's decisions were also based on gender stereotypes at rates exceeding the chance score of 2 in the match condition, $t(14) = 10.46$, $p < .01$ and the conflict condition, $t(14) = 3.29$, $p < .01$.

Further analysis was undertaken to investigate why there was an effect of condition with both adults and children choosing in line with gender stereotypes more often in the match condition than the conflict. Only one participant predominantly based their results on first possession, choosing in line with this in 3 out of the 4 trials, suggesting that this effect was not a result of a small group of participants who consistently based their decisions on first possession rather than stereotypes. In the conflict condition (where first possession did not also support endorsements in line with stereotypes) a trend, which fell just short of significance, was observed with higher scores for feminine items than masculine, $t(32) = 1.966$, $p = .06$. More participants also had higher scores for the feminine items than the masculine items (McNemar sign test, $N = 12$, $k = 2$, $p = .04$). There was also an effect of condition when examining only masculine items, $t(66) = 2.47$, $p = .02$, which was not evident when examining scores for feminine items alone, $t(66) = 1.63$, $p > .10$. These results suggest that the effect of condition was a result of the masculine items being more weakly stereotyped than the feminine items. When an item is strongly stereotyped, as in the cases of the feminine items, responses are based on gender stereotypes, regardless of whether this matches first possession or is in conflict with it. When items are more weakly stereotyped (i.e. the masculine items) first possession is sometimes used to decide who owns an object, thus leading to the effect of condition observed in this study.

2.4 Discussion

The results demonstrate that, contrary to the findings of Friedman, (2008) children and adults use gender stereotypes when making ownership decisions, and will use this information over who was seen possessing the object first, as long as the stereotype is strong enough. Results indicated that for items which are very strongly stereotyped (i.e. the feminine ones), responses are based on gender stereotypes, irrespective of whether they are pitted against first possession, or are in line with it. However when weaker stereotypes are used (i.e. masculine items) first possession is still used in certain circumstances when it is pitted against gender stereotypes.

The masculine objects used in this study were more weakly stereotyped than the feminine objects, however rather than simply being down to an unequal choice of objects this may reflect a greater flexibility for masculine toys in the real world. This could have resulted in all masculine toys generally being viewed as more weakly stereotyped than feminine toys, no matter which masculine toys were chosen. Previous research (Edelbrock & Sugawara, 1978) has shown that boys aged 3-5 years-of age adhere more to the masculine role than girls of the same age adhere to the feminine role. The results also showed that girls demonstrate a wide range of preferences when choosing toys at this age in comparison to boys. Further research (Eisenberg, Murray & Hite, 1982) demonstrated that boys are more likely than girls to pick opposite-sex toys as most disliked, and are more aware of the greater pressure put upon them to act in sex-typed ways. With this in mind it may be that there are more clear distinctions surrounding feminine toys compared to masculine ones. Boys are under pressure to avoid toys even remotely stereotyped as being for girls, whereas girls do not experience the same kind of pressure. A study by Campenni (1999), in which parents and non-parents rated the appropriateness of toys for boys

and girls, showed that feminine toys were more strongly gender-stereotyped than masculine ones. Boys are discouraged from playing with feminine toys, and as a result of this they avoid them. Girls do not receive the same message and as such, at times, actually prefer masculine toys over feminine ones (Etaugh & Liss, 1992). The boundaries therefore surrounding masculine toys and feminine toys seem very different. Adults and children will rarely see a feminine toy as appropriate for a boy, leading to this toy being distinctively categorised as only appropriate for girls. However it seems more acceptable for girls to play with masculine toys, and therefore a definitive boundary does not exist in the same way. The ratings in the Campenni study support this line of thought. The most feminine score a toy could receive was a 1 indicating “only appropriate for girls.” The toy deemed most feminine in the ratings scored 1.6. In comparison a score of 9 meant “only appropriate for boys” with a 7 being “mostly appropriate for boys and somewhat appropriate for girls” The masculine item scoring most highly received a score of 7.5 reflecting the fact that masculine toys are also, to an extent, deemed to be appropriate for girls to play with, even if they do so less often. Based on the aforementioned findings it seems logical that in the conflict condition of this study the scores for the masculine items would have been lower, particularly as there was also information available regarding first possession. In the condition where first possession was in conflict with gender stereotypes both adults and children may have viewed the masculine items as appropriate for both sexes, and therefore weighed this information less strongly when it conflicted with who was seen possessing the item first. Even with the differences between the two conditions it seems that the first possession bias does not form the basis of all ownership judgments, and in certain circumstances other information, such as gender stereotypes, will be weighed more strongly in these decisions.

It follows that stereotyped information, other than gender, may be taken into account in ownership decisions. Whilst gender is a very salient stereotype, and one which children learn about from a very young age, Martin Eisenbud and Rose (1995) propose that in real world setting children may use other information, such as age, when making decisions. Blake and Harris (2011) suggest their developmental model of ownership is based upon simple visual associations which children make between people and objects, including objects associated with adults such as their parents. If children are making these associations from a young age it seems plausible that they may learn about age stereotypes and the differences between the objects they play with, and the objects which they associate with their parents. A second study examined whether age stereotypes also guide the decisions of adults and children, or whether it is only particularly salient stereotypes, such as gender, which children and adults weigh more strongly than first possession.

2.5 Method

2.5.1 Design

The design was identical to that of Experiment 1. A 2x2 between subjects factorial design was used. Factor 1 was age which had two levels; adults (aged 18-60) and children, (aged 3-4). Factor 2 was condition which included 2 levels, age stereotype matches first possession (match) and age stereotype is in conflict with first possession (conflict). The dependent variable was whether the first or second possessor of the object was chosen as its owner.

2.5.2 Participants

Forty adults aged between 18 and 60 years and 30 children aged between 3 and 4 years-of-age participated. Adults were recruited from Northumbria University and were predominantly white middle class. Children were recruited from primary schools in the North East of England serving mainly white middle class backgrounds. Within each age group participants were randomly assigned to one of two conditions. In the match condition there were 20 adults; 4 male and 16 female (M = 22 years 4 months, range 18 years – 56 years) and 15 children; 6 male and 9 female (M = 3 years 7 months, range 3 years – 4 years 10 months). In the conflict there were 20 adults; 6 male and 14 female (M = 28 years, range 18 years -58 years) and 15 children; 9 male 6 female, (M = 3 years 9 months, range 3 years – 4 years 11 months).

Table 2.2 Number of participants (by age group & gender) for the match and conflict conditions.

Condition	Adults		Children	
	Male	Female	Male	Female
Match	4	16	6	9
Conflict	6	14	9	6

Ethical approval was granted by the Northumbria School of Life Sciences Ethics Committee. Written informed consent was obtained from the adult participants (see Appendix 2&3) before any testing took place. Prior to the commencement of any

testing of child participants at primary schools the head teacher consented to the experiment taking place (see Appendix 1). Written, informed consent was also obtained from the parents of the participating children (see Appendix 2 & 3), and on the day of testing if the child seemed uncomfortable, or said they did not wish to take part, and did not give their verbal consent, they were not involved in the study. Children were given child friendly pens and pencils for taking part, and the staff at the school were given boxes of chocolate as a token of thanks. Adults were debriefed immediately after the experiment. Children were verbally debriefed and thanked for taking part and debriefs were given to parents when they came to collect their children from school (see Appendix 4).

2.5.3 Materials

Participants read four stories presented in 3 page booklets (see Appendix 5.2 for examples of all stories). In this experiment the stories did not feature two children and four gender stereotyped objects, but instead were about an adult male, a boy, and four age-typed artefacts: some building blocks, a laptop, a toy helicopter and a car key (with this order or it's reverse used). Two of these objects are typically associated with children, and two of the objects are typically for adults. As in Experiment 1, in each story one character was seen possessing the object followed by the other character possessing the object. The object then appeared between the characters on the final page of the story and participants were asked who the object belonged to. In Experiment 1 the gender of the character was not explicitly stated. However in this study participants were informed of the age of the characters (e.g. Rob is 6 years old, Dave is 45 years old). The reason this information was explicitly given was due to pilot testing, in which some children had difficulty in distinguishing

between the adult character and the child character. In the condition where age stereotypes and first possession matched, the character first shown possessing the object was congruent with the age stereotype of the object they possessed (e.g. a toy helicopter first possessed by the boy and subsequently possessed by the man). The reverse was the case in the condition where the age stereotype of the object was in conflict with first possession, (see Figure 2.3 for an example of the condition where age stereotypes match first possession).



Figure 2.3 Example stimuli used in the match condition of the age study.

2.5.4 Procedure

The procedure was identical to that of Experiment 1. In each of the two conditions adults and children received 4 trials. Adults were tested individually in a quiet room in the Cognition and Communication laboratory in Northumbria University. Adults were given the story booklets and answer sheets and were left alone to read the stories and complete the answer booklets (see Appendix 6 for example of answer booklets). Children were tested in a quiet corner of their classrooms, or in adjoining rooms. The words were printed on the stories but, given the age of the children, they were read out to them. The children were also monitored to make sure they were engaging with the story. In both conditions each page was shown to the child, and the accompanying text was read out. When the final page of the story was reached the

child was asked “Whose is the [insert object name]?” If the child said “I don’t know” or did not answer they were recycled through the story and asked the ownership question again. If after the second time of asking the child still failed to give an answer they were moved onto the next story. The age of the first seen possessor, whether the child character was on the right hand side of the object in the final picture and the adult character on the left, or the reverse was counterbalanced across participants.

If adults and children use stereotype information to make ownership decisions, and weigh this information more strongly than first possession, then, as in Experiment 1 ownership judgments should be made in line with the stereotype of the object. It was expected that children and adults would attribute ownership of the “adult” objects to the man and the “children’s” objects to the boy, irrespective of whether they were seen possessing the object first or not.

2.6 Results

In each condition for each story participants received a score of 1 each time they made ownership decisions consistent with age stereotypes, and a score of 0 each time their decisions were inconsistent with age stereotypes (maximum score 4). All children answered all the ownership questions therefore all children were included in the analysis. One adult in the conflict condition responded “I don’t know” to the ownership question and was therefore excluded from analysis. The mean endorsements of ownership decisions in line with age stereotypes by adults and children is shown in Figure 2.4

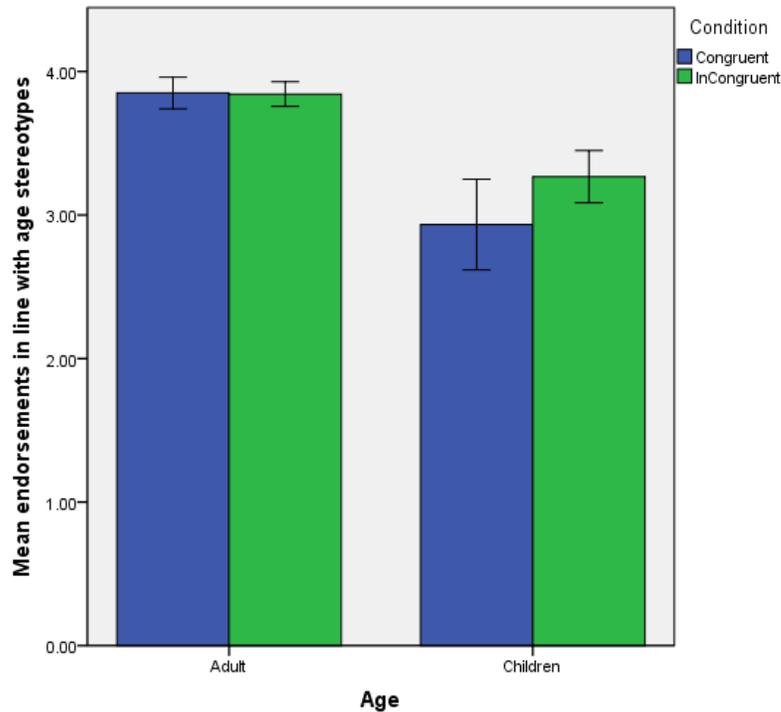


Figure 2.4 Mean endorsements in line with age stereotypes in the match and conflict conditions.

As in Experiment 1 an initial analysis of variance (ANOVA) was conducted which included participants' gender as a factor. There was no main effect of gender or any interaction effects and, as in Experiment 1, gender was removed as a factor in all subsequent analyses.

The data from the adults and children was then submitted to a 2 (age group: adults v 3-4 year-olds) x 2 (condition: match v conflict) ANOVA. Results showed a main effect of age, $F(1, 65) = 17.55, p < .01$, with adults choosing in line with age stereotypes more often than children (adults, $M = 3.85$; children, $M = 3.10$). There was no significant main effect of condition, $F(1, 65) = .835, p = .36$, and no significant age x condition interaction, $F(1, 65) = .92, p = .34$.

The results of the adults and children were then analysed separately. A one way ANOVA demonstrated no significant main effect of condition in the results from the adults, $F(1, 37) = .003, p = .96$, with decisions being made in line with age stereotypes when the stereotype matched first possession, ($M = 3.85$) and when it

was in conflict with first possession ($M = 3.84$). Further analysis revealed that adults made ownership decisions in line with age stereotypes at rates exceeding chance in the match condition, $t(19) = 16.91, p < .01$ and the conflict condition, $t(18) = 21.43, p < .01$.

Children's results were similar with a one way ANOVA demonstrating no significant main effect of condition, $F(1, 28) = .837, p = .37$. Children made decisions in line with age stereotypes when the stereotype matched first possession ($M = 2.93$) and when first possession and age stereotypes were in conflict ($M = 3.27$). Children's ownership decisions were also in accord with age stereotypes at rates exceeding the chance score of 2 in both the match condition $t(14) = 2.96, p = .01$ and conflict condition, $t(14) = 6.97, p < .01$.

2.7 General Discussion

The purpose of the previous experiments was to investigate whether adults and children rely on first possession when making ownership decisions, regardless of what other information is available, or whether information, such as the gender or age stereotype of the object, can affect judgments. It was hypothesised that when objects are used which are strongly stereotyped, in gender or age, both adults and children will take this information into consideration, and group stereotypes will be relied on more strongly than the first possession bias.

The results from both Experiment 1 and 2 supported the hypothesis, with information about group stereotypes being relied on rather than the first possession bias. In both studies in the condition where the group stereotype matched the first possessor (a girl playing with a baby doll, an adult holding a car key), and when the group stereotype was in conflict with the first possessor (i.e. a boy holding a baby

doll, a child holding a car key) both adults and children chose in line with group stereotypes.

In Experiment 2 there was no difference across the match and conflict conditions. However this was not the case in Experiment 1. The difference in Experiment 1 was most likely driven by responses to the masculine items, which were deemed to be more weakly stereotyped than the feminine items. In Experiment 2 all the items were strongly stereotyped, which led to no difference in responses between the two conditions. Whilst the results from both adults and children in Experiment 2 support this explanation the results from the children are surprising. In the match condition, where age stereotypes and first possession point to the same character as the owner of the object decisions were made in line with age stereotypes less often than in the conflict condition, where age stereotypes conflicted with first possession. These results may be driven by two children in the match condition, one of whom made no decisions in line with age stereotypes across all 4 trials, and one who only chose in accordance with age stereotypes in 1 out of the 4 trials. However whatever the interpretation of these findings it is important to note that children's responses in *both* conditions were in line with age stereotypes at rates exceeding chance.

The results of these experiments demonstrate that, in contrast to previous studies, where gender stereotypes were neglected in favour of first possession, (Friedman, 2008) group stereotypes are taken into account in ownership decisions. Furthermore group stereotypes are not just heeded as a last resort when there is no other information available upon which to make a judgement. In these experiments adults and children could have chosen the first possessor as the owner of the object, a choice which has been well documented in other serial possession studies (Friedman & Neary, 2008; Friedman, 2008; Blake & Harris, 2009). However despite this option the information about group stereotypes was regarded more strongly, and

as such this formed the basis of ownership decisions, being preferred to the information about first possession. Both adults and children could have also based decisions on visual associations (Blake & Harris, 2011) choosing the character who first possessed the object, and with whom they made the first visual association. However results showed that when the first possessor was not stereotypically associated with the object they were possessing they were not chosen as the owner of it, a finding which cannot be explained by the visual association account of ownership.

In Experiment 1 adults and children also used gender stereotypes completely spontaneously. The characters in the stories were not explicitly labelled as being male and female, and the text that went with the pictures did not clearly state this is a girl or boy. It appears then that adults and children require no prompting to base decisions on group stereotypes, but view them as a valuable source of information when faced with ownership judgments. Experiment 2 cannot be viewed in a similar way as, due to the confusion identified during pilot testing, the characters in the stories had to be explicitly labelled in terms of their age, which may have prompted participants to consider this in their ownership judgements. This is not to say that stereotypes will be favoured over all other information i.e. if a boy is given a doll as a gift. However in the absence of compelling evidence to the contrary, group stereotypes provide strong enough information to guide ownership decisions, even when information about first possession is available.

These results also support the previous findings relating to the effect of gender stereotypes on object preference and use. Research by Kuhn, Nash and Bruckner (1978) demonstrated that children as young as 2 years-of-age know that certain toys are preferred by girls and certain toys are preferred by boys. Children aged 3-5 years-old are also aware of group stereotypes, and have a desire to identify with their

gender group (Edelbrock & Sugawara, 1978). They prefer same sex toys, novel objects and peers, (Martin & Little, 1990). Children aged 4 and 5- years-old will also make predictions of what other children will like based on group stereotypes, regardless of how attractive the object is. Undergraduates also reason in a similar way, predicting that those in the same group as themselves will like the object more than those in the opposite group (Martin, Eisenbud & Rose, 1995). Given the evidence demonstrating children's awareness of stereotypes, a desire to identify with their group and a prediction that others will reason in the same way, it is not surprising that when reasoning about ownership children and adults base their decisions on group stereotypes. It should be noted that whilst these findings are in line with findings about object preference etc. these studies are some of the first to examine children's stereotypes regarding different age groups, and how gender and age stereotypes are used in ownership decisions, particularly when they are pitted against first possession.

It should be acknowledged that these results are at odds with the results of Friedman (2008) who found that children overwhelmingly rely on first possession when judging who owns a ball and a teddy bear (gender stereotyped items), and seemingly ignore stereotypes altogether. As has been previously mentioned the most likely explanation of these results, and a motivating factor for the current studies, is that the objects used in Friedman's study were weakly stereotyped, and were therefore not recognised as being for girls or for boys. Indeed based on the ratings from Campenni's study (1999) these objects are deemed by adults to be equally suitable for boys and girls. The current experiments used more overtly stereotyped objects, accounting for the difference in results.

Given the results from these studies the issue to be considered is how children and adults choose between first possession and strong stereotypes, when they

provide conflicting information regarding ownership. One explanation is that, when presented with no convincing information to the contrary, the first possession bias is relied on for ownership judgements. However when other information is provided, in this case group stereotypes, the two different types of information compete and children and adults are conflicted over which to weigh more strongly. If this is how choices are made between group stereotypes and first possession, then it should be expected that when first possession and group stereotypes are in conflict this is reflected in ownership decisions. Fewer decisions should be based on group stereotypes when this is pitted against first possession than would be if it wasn't.

An alternative explanation to this is the "no competition" account in which information about first possession is disregarded in favour of compelling evidence to the contrary. Indeed first possession may only be relied on if there is no other ownership evidence available. The findings from the current study support this theory as, particularly in Experiment 2 no differences were observed between choices in line with group stereotypes in the condition where group stereotypes matched first possession, and the groups where they were in conflict with first possession. In Experiment 1 this was not the case with endorsements in line with group stereotypes being more common when group stereotypes matched first possession, than when they were in conflict with it. However as has been previously suggested this can be accounted for by the fact that the masculine items used in this study were less strongly stereotyped than the feminine items, and therefore did not prompt participants to consider group stereotypes as readily in ownership decisions. In addition to this there seems to be more pressure for males to avoid any objects stereotyped as being feminine, and to strongly identify with their gender stereotype and act accordingly (Eisenberg, Murray & Hite, 1982). For girls however, particularly at the age of the characters in the stories, this pressure is not as strong, and girls do

not exhibit such a strong dislike of opposite-sex toys. With this in mind participants, both adults and children, may have viewed it as acceptable and normal for a girl to be playing with a truck, rather than viewing it as a girl playing with a masculine object which could not belong to her. Therefore some participants may have chosen the first possessor in the conflict condition, as they deemed the object to be equally appropriate for boys and girls. They did not recognise any other information to challenge first possession, and so used this as the basis for their ownership judgments.

Previous studies contradict the explanation that the first possessor is only used when there is a lack of other information to guide ownership (Blake & Harris, 2009; Friedman & Neary, 2008). In these studies first possession was pitted against gift giving, in that the first possessor of the object was giving it as a gift to the second. In these studies children aged 3-4 years-of-age overwhelmingly chose the first possessor as the owner of the object, judging that the second possessor should return the gift to them after they had played with it. In these cases information competing with first possession was disregarded, and the first possessor bias was used to guide ownership decisions. At first it seems like these studies call the “no competition” account of ownership into question. However this depends upon how the results of these studies are interpreted. One interpretation of the findings, which would challenge the results of the current studies, is that the children did not disregard the first possessor, even when they had other available information to guide their ownership decision. The findings of the studies in this chapter support a different interpretation. The gift giving situation in both of these studies was not explicitly clear and as such children may not have acknowledged that the object was being permanently transferred between the two characters. In Blake & Harris’s study (2009) the gift was found at home, wrapped and given as a gift to another child. In Friedman

and Neary's study (2008) the object was not wrapped, and children were merely informed that one child was giving it to another child as a gift. Both of these scenarios were most likely unfamiliar to young children, as their experience of gift giving and receiving is likely to be largely at birthdays etc., where the gifts have not been played with prior to the giving, and are not stored in the bedroom of the giver. With this in mind the results may have been due to the fact that the children did not recognise the object was being given as a gift, and therefore, in the absence of other information regarding ownership, they used the first possessor bias as the basis of their decisions. Friedman and Neary (2008) carried out another study in which a wrapped present, not previously played with or stored in the giver's room was given as a birthday present to a second character. Under these circumstances children aged 3-4 years-of age recognised the permanent transfer of ownership, and acknowledged the second possessor as the owner of the object. Whilst this conclusion is not beyond question it may account for the, at first, contradictory results between these studies and the studies in this chapter.

Whilst an unequivocal explanation of how children and adults choose between stereotypes and first possession is difficult, in daily life it is rare to see the two kinds of information competing. Indeed as previously mentioned, it is more common to see a boy playing with football equipment than a girl, and therefore the first possessor of an object, and the group to which the first possessor belongs, will rarely conflict. Group stereotypes help to identify groups of people most likely to own a particular kind of object. First possession is more useful for pin pointing an individual owner. Due to this it is more likely that the two types of information will be used in different circumstances. First possession is useful to find a specific owner. When information regarding possession is available it is a good indication of ownership. The first person seen possessing an object is most likely its owner, save in circumstances of clear and

compelling information to the contrary. Stereotypes however are more useful and more readily used in the absence of information about first possession. For example if a jewellery box is seen lying in a playground, when looking for a potential owner the girls playing nearby would probably be sought out first. Group stereotypes narrow down plausible owners of an object, rather than pin pointing the exact owner.

Having established that group stereotypes are used in ownership judgements it is important to ascertain how they are used. Children may use group stereotypes to reason about ownership as they learn about stereotypes. Martin Wood and Little (1990) claim that children learn about stereotypes in three stages. Initially children learn through direct associations i.e. which objects are associated with which sex (e.g. boys are associated with trucks) moving onto understanding information relevant to their own sex, and then information relevant to the opposite sex. Children may use this information about group stereotypes in this way and base ownership decisions on simple associations such as these. They may see a boy in the story with a truck, know that trucks are associated with boys and therefore choose the boy as the owner of the truck. The issue with this theory is that in the current experiments direct associations can be made based on group stereotypes and on possession. In this case it would be expected that participants, particularly in the condition where group stereotypes conflict with first possession, would struggle over which association to base their decision on, and as such results would reflect this, with more decisions at a chance level. The results however did not demonstrate this, with participants overwhelmingly basing their decisions on group stereotypes, suggesting that group stereotypes are not based on mere associations alone.

Children may reason about stereotypes in relation to ownership in a similar way to how they reason about preferences. One theory of how children reason about preferences, based on gender stereotypes, is to consider who the object is for (Martin

& Halverson, 1981). In relation to preferences a child would decide who the toy is for. Is it “for boys” or “for girls”, a decision which would be made based on existing knowledge of what girls and boys typically like. Following this children compare their own sex to the sex of who would prefer the toy, to decide whether they like it or not. For example a girl would reason that baby dolls are typically “for girls,” they are a girl and therefore they will like and play with that toy. Children may also reason about ownership in this way, and use the stereotype of the object to glean information about ownership. For example children may believe that dolls are “for girls” and not “for boys,” based on their pre-existing knowledge of what each sex likes. This may then lead them to reason that the girl owns the doll as dolls are “for girls.” It must be noted however that ownership judgments are not just based on liking judgments as has been shown in previous research (Malcolm, Defeyter, Friedman & Neary, 2012).

Another account relating to preference, but one that could be applied to ownership is based on gender-centric reasoning (Martin, Eisenbud & Rose, 1995). Martin and colleagues claim that the way children reason about liking is to decide if they like it or not, and then extend this to the same and opposite genders. For example a girl likes a doll. She reasons that because she likes it, others in her gender group will like it, and conversely those in the opposite group will not like it. Ownership decisions based on stereotypes could plausibly work in this way too. A girl may view a doll as something she would like and would own, and therefore reason that other girls (same gender group) would like and own dolls, and boys (opposite gender group) would not like and not own dolls. Results from studies suggest that children use a gender centric pattern of reasoning when making decisions about other children’s preferences for gender stereotyped toys (Martin, Eisenbud & Rose, 1995) therefore it is certainly a possibility that children may reason in this way when making ownership judgements. However again it must be acknowledged that ownership decisions differ

from liking decisions, and just because a child recognises that a character may like something does not mean they will automatically assume ownership because of this. At present these theories are tentative and further research is imperative to determine more clearly how children use group stereotypes in ownership decisions. Studies have shown that ownership judgements are not just decisions about who likes an object more, and perhaps theories about preferences based on group stereotypes cannot be extended to include ownership decisions. Future research could more closely examine the theories of how group stereotypes are used in ownership decisions, whether it is liking, association or ownership, by perhaps asking children about objects liked, but rarely owned, by a group. For example children like playgrounds and soft play areas far more than adults, however adults are far more likely to own these. The answers from studies like these would give more insight into how group stereotypes are used, and whether they are clearly distinguished from decisions of liking and association.

Regardless of how group stereotypes are used the results from this study demonstrate that they are used in ownership decisions, and are weighted more strongly than first possession and visual associations. Ownership decisions regarding group stereotypes are different from other studies, as these decisions usually involve attributing a kind of object to a particular group, rather than attributing an object to a person based on individual characteristics. When faced with a doll, children may reason that this object must belong to a girl because dolls (a kind of object) usually are liked and owned by girls (a kind of person). In other types of ownership decision children and adults are usually faced with deciding if a particular object belongs to a particular person, for example this ball belongs to this boy because he was seen possessing it first. In the current experiments it is clear that children did not reason in

this way, but instead reasoned using group stereotypes, as answers were based on group stereotypes and not on first possession.

2.8 Concluding remarks

In conclusion the results from the studies suggest that both children and adults take group stereotypes, such as age and gender, into account when faced with ownership decisions, and weigh this information more strongly than first possession. Responses from the first study demonstrate that on some occasions, when weaker stereotyped items are included (i.e. masculine items), first possession is sometimes used as the basis for ownership decisions. If objects are not strongly gender stereotyped participants may deem them to be equally appropriate for boys and girls, and therefore not a source of information to give them guidance on their ownership decision. In this case first possession is the only available information to provide any clue to ownership. The results also demonstrated that objects stereotyped as being for boys are generally weaker than those stereotyped as being for girls, which may be a reflection of the pressure boys feel to conform to their stereotype, and avoid any objects stereotyped as being for girls; a pressure girls do not experience to the same degree.

How stereotypes are used in ownership decisions remains, at present, an open question. Ownership decisions involving group stereotypes differ from other ownership decisions, which usually involve the individual characteristics of people and objects, rather than groups of people and kinds of objects. However what the results of the current studies demonstrate is that group stereotypes have an influence on ownership decisions and the stereotype of an object may affect ownership decisions regarding individual people and individual objects.

These results therefore must be taken into account in further studies. Neutral objects should be used in future studies as stereotyped objects may affect ownership decisions even when they are not being explicitly tested. The experiments in the other chapters of this thesis involve ownership judgments of individual people and individual objects. With this in mind the objects used in all other studies will be neutral to ensure ownership decisions are not affected in any way by stereotyped objects.

Chapter 3: The Role of Constructive Possession in Ownership Decisions

3:1 Introduction

The results from the previous chapter showed that adults and children can use group stereotypes to decide who owns an object. However as previously mentioned group stereotypes often help to narrow down potential owners of an object to members of a group most likely to own the object, rather than to specific individuals. Other information must therefore be taken into account when making ownership decisions about specific individuals owning specific objects. Many of the studies investigating children's understanding of ownership have focused on who has the ability to own (Noles & Keil, 2011), transfers of ownership (e.g. Blake & Harris, 2009; Kim & Kalish, 2009) and ownership rights (Rossano, Rakoczy & Tomasello, 2011). Studies investigating how children infer ownership of objects have included whether creative labour leads to a right of ownership (Kanngiesser, Gersoe & Hood, 2009), and whether first possession is a useful way of pin pointing specific owners (Friedman & Neary, 2008).

In the studies where first possession has been seen to be the deciding factor of ownership (particularly Friedman and Neary, 2008) the scenarios usually involved serial possession studies, set against a plain white neutral background. In these stories one character physically possesses the object (usually held in the character's hand), followed by the other character. There are however other ways that possession can be construed. Possession is not just limited to physical or actual possession, and it should be acknowledged that, in life, objects which are owned are not always physically possessed by the owner. For example people can own stocks and shares, and whilst they may physically possess a portfolio detailing what they

own and how much this is worth, they cannot at any point physically possess the stocks and shares themselves. Their claim of ownership however remains unquestionable despite the fact they are at no point in physical possession of the stocks and shares themselves. On a daily basis objects are encountered which are not in a person's physical possession, which raises the question of how ownership decisions are made in these situations.

3.1.1 Legal Examples of Constructive Possession

Both American and English law recognise that possession itself is a vague concept (Shartel, 1932), and one that is not solely limited to manual touch or personal custody (*Rodella v United States*, 1960). The simplest and most obviously explicit type of possession occurs when a person has direct physical control over an object or thing at a given time, along with an intention to utilise this control (*State v Jameson*, 2007). This is known as actual possession or "possession in fact." A different and more complicated type of possession is that of constructive possession. Constructive possession is "A legal fiction used by courts to impose criminal liability in situations where there is no actual possession," (Singer, 1992, p.1008). This type of possession requires the capacity and intent to control property, but does not necessitate physical touch to be present to establish a claim of ownership. On this premise a person may have a thing in their possession, even if they do not physically have it on their person. A simple everyday example of constructive possession is that a person can own the belongings in their house even when they are out of the house, and do not have actual physical possession of the items. This type of possession is also referred to as "possession in law." Constructive possession is not a new concept, with cases as early as 1808 using constructive possession as a doctrine by which to make

decisions of criminal prosecutions. Constructive possession was developed to combat the problem of larceny. To be guilty of larceny a person must be found to have taken something from another without their consent. A problem which arose in relation to convictions of larceny was whether a servant had custody of goods which were delivered to him by his master, and were to remain in the master's house. If the master did not have actual possession of these goods and the servant took them, could this amount to a conviction of larceny? In the case of *Jacobsen v Aetna Casualty & Surety Co.* (1951) the court resolved this problem by introducing the concept of constructive possession, whereby the master had constructive possession, even where the last trace of actual possession or physical control by the master had been eliminated. As such if a servant took these goods he was indeed guilty of theft, and could be punished accordingly. The law recognises that constructive possession can occur in many different settings, applying not only when goods are stolen, and extending beyond goods held in a person's home.

In *United States V Zavala- Maldonado* (1994) further examples of constructive possession were given. It was stated that a person can possess items that are kept at home in drawers, held by agents or secured in a bank. Despite the fact that the person may not physically possess the items, they still knowingly have the power and intention to exercise control over them. For example whilst an object may be held in a security box at a bank the owner still has constructive possession over it, as they have the power to instruct the bank official to open the box whenever they wish to retrieve the contents.

In American law many judgments of ownership and liability have been based on the doctrine of constructive possession. In the case of *People V Vander Heide* (1920) the defendant was found guilty of possessing alcohol which was in trunks in the actual possession of someone else. The defendant however had baggage labels

on him which matched the trunks in which the alcohol was stored. The court maintained that, in certain circumstances, possession of an object is not limited solely to those with which someone is in physical contact and, as such, whilst not physically possessing the alcohol, the defendant constructively possessed it, and should therefore be held accountable for it. Based on these kinds of cases it is clear that, in law at least, ownership of something is not dependent on first possession, or even possession at all. Someone else can be seen possessing the objects, but this does not amount to a claim of ownership over them. Ownership can be attributed to someone who is not seen possessing the objects. If the law can attribute ownership to someone who does not have actual possession of an object, perhaps adults and children will be willing to do the same in their ownership judgments.

The judgement in *State V Parent* (1923) was also made based on constructive possession. The defendant, the manager of a public house, was charged with unlawfully possessing alcohol. Police entered the inn and found the employees of the manager, along with other individuals, gathered inside. Six of the customers were sitting with glasses containing alcohol and, upon further inspection of the property, a bottle of alcohol was discovered in a pantry connected to the kitchen where the defendant was working. Despite denying knowledge of the alcohol at trial, and highlighting the fact that there were six other employees on the premises who also had access to the area where the alcohol was discovered, the court held that the manager had constructive possession of the alcohol. In this instance possession simply meant that a thing was owned or under the influence of someone, so that actual direction over it could be exercised. As such a conviction was supported on this basis. Due to the fact that the defendant was the manager of the inn, he had the right to actual possession of the alcohol at any point he wished, and the fact he wasn't in actual possession at the point of arrest did not negate the importance of

this. This case highlights that ownership, based on constructive possession, is about an ability to exercise control and an intention to do so, not whether a person is seen possessing an object. It is an establishment of the right to actual possession that is important in these decisions. If adults and children base their ownership decisions on constructive possession then, rather than focusing on who possesses the object, they must determine who has a right to actual possession and control over the object.

An early case in English law which clearly demonstrates the use of the constructive possession doctrine is that of *Hibbert v McKiernan* (1948). Whilst trespassing on a private golf club Hibbert took away with him 8 golf balls which had been lost and abandoned by their owners. He was caught and charged with theft. However it was argued that the golf club did not own the balls as they had no possession, control or special interest in them. The court rejected this argument stating that the golf club owned the balls based on the premise of constructive possession. The fact they owned the land upon which the balls had been abandoned, and also had the intention of excluding trespassers from the land was enough to establish their claim that they constructively possessed the golf balls. Even though Hibbert had actual possession of the golf balls, and the golf club did not physically possess the balls at the time of the theft, the court accepted that they owned them because they had constructive possession of them at the time they were stolen. This case is different from the previously mentioned cases as constructive possession in this case was held by a club and not a single person. The principle of constructive possession however remains the same. The club had demonstrated their intent to own the balls due to the fact they had made an attempt to keep other people from the land which they owned. Had they demonstrated no attempt to keep trespassers away the verdict may have been different. However an intention to exercise control was

demonstrated and, as such, the lack of physical possession of the balls did not matter.

The previously mentioned cases, where constructive possession has been established, all include the inference that at some point in the past there has been possession of the object by the person deemed to be the owner. A case, in which constructive possession was deemed to be apparent, even without any prior possession of the object, was that of *Four Point Garage Ltd v Carter (1985)*. In this case the defendant had agreed to purchase a car from a third party - a car dealer - and had paid the purchase price in advance to said third party. At the time of this transaction the third party did not have the particular model of car in stock but arranged to purchase it from the plaintiff. The plaintiff then delivered the car direct to the defendant as instructed by the third party. The contract between the third party and the plaintiff included a clause to the effect that the title of the car remained with the plaintiff until the car had been paid for in full, which had not been done by the third party, despite receiving money from the defendant. The third party went into liquidation and the plaintiff sought to claim back the car from the defendant, invoking the retention of title clause that existed in the contract between himself and the third party. The plaintiff argued that good title was never passed to the third party due to the fact that they had not paid for the car in full. Further to this the third party had never had physical possession of the car and had not delivered it to the defendant. It was argued that on this premise good title could not have passed from the third party to the defendant, because the third party never physically had the car to deliver. The court however held that, even though the third party never physically possessed the car, they had constructive possession of it. It was judged that a person can be deemed to be in possession of goods when they are in his actual possession, where they are held by another person, but are subject to his control, or when they are held

for him on his behalf. In this case it was held that, due to the constructive possession which the third party had, the plaintiffs acted as agents for the third party when making the delivery to the defendant. On these grounds the third party did not have to physically possess the car in order to transfer good title to the defendant, and constructive possession was enough to establish this. The court then held that the defendant had a claim of good title in relation to the car, and judged in their favour. This case highlights that constructive possession can still exist even if there has been no prior physical possession of an object. As long as a person has the ability and intention to exercise control over an object, this is enough to establish constructive possession. Whilst prior possession is often a part of constructive possession it is not imperative in order to establish a claim of constructive possession.

A final case highlighting an important aspect of constructive possession is the case of *Parker v British Airways* (1982). The court deemed there to be no constructive possession as an important aspect of it was missing. Mr Parker found a gold bracelet on the floor of the executive lounge at Heathrow airport, operated by the British Airways Board. He handed it in to an employee, requesting it be returned to him if no claimant came forward. The Board instead sold the bracelet and kept the money. Mr Parker subsequently sued them claiming that his title of ownership was stronger than theirs, as they had no prior possession of the bracelet; actual or constructive. Mr Parker won the case as the court held that, whilst the Board had the capacity to assert control over the lounge and the things in it, they had demonstrated no intention to do so, a vital feature when establishing constructive possession. As such they had no constructive possession of the bracelet to combat Mr Parker's actual possession of it. Mr Parker was accordingly awarded compensation.

Based on the aforementioned cases it is clear that in law constructive possession is an important doctrine, and one upon which many legal decisions are

made. The question then is how much in everyday life is constructive possession used to establish claims of ownership? Do people who do not have a comprehensive grasp of law reason in the same way as the law prescribes, or is there a large gap between the reasoning of those educated in the law and those not?

3.1.2 Alternative Accounts

Some accounts predict that ownership decisions should not be based on constructive possession, but something entirely different. Whilst it is recognised that in law constructive possession is, “A fluid concept which takes on new meaning in each new circumstantial context” (Caudill, 1981, p. 256.), there are some common factors present in each instance of constructive possession. To attribute ownership to a person based on constructive possession there must be an intention of the person to exercise control over the object, and the ability to do so (United States v Zavala-Maldonado, 1994). There is usually also a very strong inference that at some point in the past that person has also possessed the object (McMurray, 2008). There does not however need to be any concrete visual association between the person and the object. Other accounts require more concrete links to establish ownership, such as seeing a person with an object, and creating a visual association between the two based on this. Whilst at a later date this association may be successfully updated verbally, the initial association requires the person to be seen with the object.

One such account is that of Blake and Harris (2011), who claim that young children’s reasoning about ownership centres on creating concrete relationships between people and objects, by observing visual associations between them. According to Blake and Harris, early in life children make visual associations between people and objects when they see them together. They propose that infants engage

in selective tracking to pick out the most salient people object relationships, which are then, usually verbally, reinforced by their parents (“yes that is daddy’s coat”). In contrast, incorrect associations are usually met with a negative response or a correction. Intention is also important in forming associations, and Blake and Harris acknowledge that an intentional action by the person towards the object is usually required in order to establish an association. As children get older Blake and Harris (2011) purport that they are able to update their existing associations based on verbal information, as long as they possess representations of real entities, such as objects and owners the child has seen before, initially acquired through visual associations. Blake and Harris used this theory to challenge the first possessor heuristic which Friedman and Neary (2008) used to explain the results they obtained in their serial possession experiments. They claim that rather than a first possessor heuristic, it could be that when a child sees a character and an object together, and hears at least a description of an intentional action upon the object, they will create a person-object association, which they will use to infer ownership of the object. One question relating to the association account of ownership is whether verbal and visual information are encoded in the same way, and produce equivalent representations of ownership. A study by Ganea and Harris (2010) suggests that initially these mediums of information may be encoded differently, with one prioritised over the other. In this study 23-month-old toddlers helped hide a toy in a room with several possible hiding places. The toddlers were then taken behind a curtain and told that the toy had been moved. When children were then asked to find the toy most of them returned to the original location where they had seen the toy being hidden. In contrast when children witnessed the change they were successful in retrieving the toy from the new hiding place. By 30-months-of-age however children were able to update their visual representation with verbal information, and find the toy in the new location on their

first attempt. These findings suggest that as children get older they are able to update a visual association with verbal information.

A further study by Blake, Ganea and Harris, (2012) tested whether children prioritised verbal or visual information when these two cues were in conflict with one another. Their results showed that children are able to accept verbal statements of ownership over visual cues. However it is not until 5 years-of-age that children do this consistently. In their study children observed characters playing with a ball. In the consistent condition the visual and the verbal information identified the same character as owner of the object. In the inconsistent condition the verbal information identified one character as the owner and the visual information identified the other. Results showed that when the visual and verbal information were inconsistent children aged 2-3 years-of-age prioritised the visual cues over the verbal information in their ownership decisions. By 4 years-of-age some children were able to use the verbal information to guide their ownership decisions, even when it conflicted with the visual information. However it was not until the age of 5 that children robustly prioritised the verbal information over the visual cues, when making decisions of who owned an object.

Applying Blake and Harris's (2011) account of association to ownership children initially need to see an owner perform an intentional act upon an object in order to encode a robust relationship. By the age of 30 months they may be able to add information to an existing representation of the object, but in order to get this initial representation children need a concrete visual association. Once this ownership relationship is made, whilst it can be added to verbally, it seems that until the age of 5 years-old children will not reliably prioritise verbal over competing visual information. Blake and Harris cite the study of Friedman and Neary, (2008) in which children saw an initial character playing with an object. A visual association was made between the

character and the object, which was visually encoded. Seeing a second character subsequently play with the toy seemingly did not provide enough challenge to the initial ownership relationship they had encoded, and children chose the first possessor of the object as the owner. Similarly in Blake and Harris's (2009) study young children made a visual association between a gift giver and an object, which could then not be overridden by information, given verbally, that the object was in fact being given as a gift to another character. Children resisted updating this initial visual association, instead maintaining that the recipient of the gift should in fact return it to the giver. Based on the aforementioned studies Blake and Harris (2011) tentatively purport that the strength of the ownership relationship may be based on how the ownership information is encoded. Until the age of 5-years-old ownership associations which are verbally encoded may be weaker than those which are based on a visual association, and encoded as such. Associations based on verbal information may also be more easily updated, whereas ownership relationships which are initially visually encoded may be resistant to ownership updates, no matter what form the new ownership information takes. Blake and Harris note that by 5years-of-age children will have learnt to accept verbal information over visual experience in a number of different contexts. However until this age the conflict between these two types of information is put forward as the explanation of why younger children sometimes struggle to understand who owns what.

This account is certainly one way in which the results obtained from serial possession scenarios can be explained. However as previously mentioned it is not a theory which entirely fits with the doctrine of constructive possession. A necessary aspect of the association account of ownership is that, at some point, explicit ownership information is presented, whether this is a visual representation of a character performing an intentional act upon an object, or whether it is verbal

information explicitly stating who the owner of an object is. Constructive possession is a doctrine established to be used in some cases where there is no current possession, but a strong inference that at some point in the past there has been. In some cases of constructive possession, the object and the person are never seen in the same room, and there is no explicit verbal information stating that the person is the owner of the object. In other instances the person seen with the object is not in fact the owner of it. The association account seems to struggle to explain situations such as these. If the association account explains how children and adults make ownership decisions, it would seem more likely that, rather than choosing the person who has constructive possession of the object, they would choose the person who was first seen with the object, and with whom they made a visual association.

An alternative account of ownership is the historical account (Friedman, Neary, Defeyter & Malcolm, 2011), which suggests that when deciding who owns an object people attempt to reconstruct the history of it, to establish who was more likely to have had past contact with it. If a person is seen possessing an object it could be inferred that the person had the object in the past, having legitimately acquired ownership of it. If presented with information calling the legitimacy of the initial acquisition into account it would be logical to then look for the person who possessed the object prior to the current possessor. In serial possession studies, where one character possesses an object followed by a second character possessing it, the historical account would explain why the first possessor of the object is chosen as its owner. Despite the fact one character possesses it followed by another, there is nothing to suggest that the second character had possession of the object before the scenario began. The second character possesses the object after the first character has already been observed possessing it. The first possessor however was seen with the object when the scenario began, therefore it could be assumed that the character

possessed the object before the scenario began, having acquired it at some point in the past in a legitimate manner. Because there is no mention of a transfer of ownership between the first and second possessor, the reasonable answer as to who owns the object is the first possessor. This character is not just the first seen possessor in the story, but history would suggest this character had prior possession of the object, having acquired ownership of it before the story began. First and current possession provide possible information about the history of an object. Subsequent possession does not work in a similar way. It is therefore important to reconstruct the history to find out who had possession of the object in the past, not merely who is first seen possessing an object.

The historical account can perhaps more easily explain how people reason about constructive possession. As previously mentioned constructive possession exists where current physical possession is absent, but where someone has both the intention and the ability to control an object at a given time. Within constructive possession there is also a strong inference that at a particular point in the past there has been possession of the object, in spite of the fact that that possession may not now be apparent. This aspect in itself encourages a person to reconstruct the history in order to work out who, in the past, possessed the object, whether they obtained it in a legitimate way, and whether at any time possession was transferred to someone else. If prior possession of an object can be established, and there is no evidence of a legitimate transfer of ownership then, even if that person is not possessing the object at a specific point in time, or even if it is being possessed by someone else, a claim of ownership based on prior possession would be upheld. The goal of reconstructing the history of the object is to establish which character was more likely to have had past contact with the object. This is not who is first seen with an object, but rather who possessed the object in the past, and therefore has a legitimate claim of ownership

over it. It is important to acknowledge at this point that whilst constructive possession in most cases includes a strong inference that at some point in the past there has been prior contact with an object, there are some exceptions where a person may be deemed to have constructive possession of an object even without this inference. For example if a product is purchased from a website and posted to a house whilst the person is out, they would still expect to have a claim of ownership of it, despite the fact they had never had prior contact with the object. This person would be deemed to have the intention and ability to exercise control over the object and as such would claim ownership of it. In this case, rather than tracing the history to find out who had prior possession of the object, the history would point to who owned the object, based on who had ordered and paid for it, and therefore who had the intention to possess and own it.

3.1.3 The Current Experiments

Given that many of the studies in which first possession has been shown to be the basis upon which ownership decisions were made, this current experiment set out to investigate whether adults and children could use constructive possession to make ownership decisions, or whether their judgments were based on who they saw possessing an object first. It must be acknowledged that in this chapter first seen possession and first possession are viewed as separate entities. When interpreting the findings from their studies Friedman and Neary, (2008) suggested that ownership is directly inferred from first possession. However the first possession they were referring to was first seen possession, i.e. the character who is seen possessing the object first in the scenario. However first possession can also refer to who had possession of the object in the past, before the scenario began. Whilst first seen

possession is often a useful cue to help ascertain who had prior contact with the object, it is not always indicative of first possession in the past. In this chapter the first possession referred to by Friedman and Neary (2008) will be labelled first seen possession, and first possession will refer to who had prior possession of the object, at a point in the past before the story began. The study aimed to pit first seen possession against constructive possession, to investigate whether it is only in law where constructive possession is widely acknowledged, or whether children and adults would view the constructive possessor as the character who had first possession of the object, at a time before the scenario began, and grant them ownership based upon this. If children directly infer ownership from first seen possession (Friedman & Neary, 2008) then in all conditions, when deciding who owns the object, the first seen possessor should be chosen, regardless of whether they are also the constructive possessor or not. If decisions are based on the association account of ownership then the character first seen with the object should also be chosen as its owner, regardless of whether this character is the constructive possessor or not. A visual association will be created between that character and the object they are seen possessing, which will resist being overwritten by the subsequent visual association between the object and the second character to possess it. In this case however it was hypothesised that when constructive possession was pitted against first seen possession both adults and children would choose the first constructive possessor of the object over the first seen possessor, having reconstructed the history of the object to determine who had past contact with it, before the scenario began. It is important to note that the constructive possession in the scenarios had to be salient in order to infer that the character had both the power and intention to employ control over the object, and also to infer that at one point in the past there was possession of the object by that character.

3.2 Method

3.2.1 Design

The study followed a 2 x 3 between-subjects factorial design. Factor 1 was age which had two levels, adults and children. Factor 2 was condition with three levels; control, match (first possessor is also the constructive possessor), and conflict (first possessor is not the constructive possessor). The dependent variable was whether the first or second seen possessor of the object was chosen as its owner.

3.2.2 Participants

Sixty adults aged 18-60 years and 43 children between the ages of 3 and 4 years participated in this study. Adults were recruited from Northumbria University and were predominantly white middle class. Children were recruited from primary schools in the North East of England, serving mainly white middle class backgrounds. This age group were chosen as this was the youngest age at which children were shown to reliably make ownership decisions that were not influenced by factors such as the end position of the object, an issue which has been shown to affect the performance of the 2-year-olds (Friedman & Neary, 2008). Children between 3 -4-years-of-age reliably selected the first physical possessor of an object in serial possession scenarios (Friedman & Neary, 2008), and so this age group were chosen when investigating whether the first possession bias extended to constructive possession.

Participants were randomly assigned to one of the three conditions according to age. In the control condition there were 20 adults (M = 23 years 6 months, range

18 years 5 months – 58 years 3 months) and 16 children (M = 4 years, range 3 years 6 months – 4 years 8 months). In the match condition, there were 20 adults (M = 21 years 9 months, range 18 years 3 months – 41 years), and 13 children (M = 4 years 2 months, range 3 years 8 months – 4 years 8 months), and in the conflict condition there were 20 adults (M = 25 years 5 months, range 19 years 3 months – 55 years 4 months), and 14 children (M = 4 years 7 months, range 3 years 5 months – 4 years 8 months).

Table 3.1: Number of participants (by age group) for the control, match and conflict conditions.

Condition	Adults	Children
Control	20	16
Match	20	13
Conflict	20	14

Ethical approval was granted by the Northumbria University School of Life Sciences Ethics Committee. Written informed consent was obtained from the adult participants (see Appendix 2&3) before any testing took place. Prior to the commencement of any testing of child participants at primary schools the head teacher consented to the experiment taking place (see Appendix 1). Written, informed consent was also obtained from the parents of the participating children (see Appendix 2 & 3), and on the day of testing if the child seemed uncomfortable, or said they did not wish to take part, and did not give their verbal consent, they were not involved in the study. Children were given child friendly pens and pencils for taking part and staff at the school were given boxes of chocolates as a token of thanks. Adults were immediately debriefed after the experiment. Children were debriefed and thanked for taking part,

and a debrief was given to the parents when they arrived to collect their children from school (see Appendix 4).

3.2.3 Materials

Adults and children were presented with 2 simple ownership stories about a boy and a girl possessing an everyday artefact (a book or a mug) in 3 different locations (see Appendix 5.3 for full examples of stories used). Each story was 3 pages long and depicted one character physically possessing the object followed by the second character possessing it. The final picture showed the two characters standing side by side, with the object placed in between them. In the control condition the stories were set against a white background. In the match and conflict conditions the stories were set in one of the characters bedrooms. In the match condition the first seen physical possessor was also the constructive possessor, and the story was set in their bedroom. For example if the first seen possessor was a boy then the story would be set in a boy's bedroom. In the conflict condition the first seen possessor of the object was not the constructive possessor of it, meaning that if the male character was shown physically possessing the object first, the story would be set in the bedroom of the female character, who would have constructive possession of the object. The match and conflict conditions were set in a bedroom as this was felt to be a salient setting, and one in which constructive possession could be simply and clearly demonstrated (see Figure 3.1 for example stimuli from the match condition).



Figure 3.1: Example stimuli used in the match condition of the constructive possession study when objects are seen in a bedroom.

3.2.4 Procedure

In each condition adults and children received two trials, with each trial involving a first seen possessor, a second seen possessor and one everyday artefact; a book or a mug. Adults were tested individually in a quiet room within the Cognition and Communication Laboratory in Northumbria University. Adults were given the story booklets and answer sheets and were left alone to read the stories and complete the answer booklets (see Appendix 6 for example answer booklet). Children were tested individually in a quiet corner of their classroom or a small room adjoining the classroom. Although the words were printed on the stories, given the age of the children, the stories were read out to them. Children were also monitored to ensure they were on task and engaging with the story. In each condition each page of the story was read to the child. When the third and final page of each story was reached the children were asked "Whose is the mug/book?" If the child said "I don't know" or did not answer they would be recycled through the story and asked the ownership question again. If after the second time of hearing the story the child still said "I don't know," or failed to give an answer the child was moved on to the next story. Only one child was recycled through both stories twice before they gave an answer. The

gender of the first seen possessor, whether the girl character was on the right hand side of the object in the final picture and boy on the left, or the reverse, and the order in which the stories were presented was counterbalanced across participants.

3.3 Results

In each condition, for each story, participants received a score of 1 each time they selected the first seen possessor of the object as the owner and a score of 0 each time they selected the second possessor as the owner (maximum score 2). All children answered all ownership questions, therefore all the data from the children was included in the analysis. One adult in the conflict condition chose both characters as the owner of each of the objects and therefore was excluded from any further analysis. The mean endorsements of the first seen possessor as the owner of the object is shown in Figure 3.2.

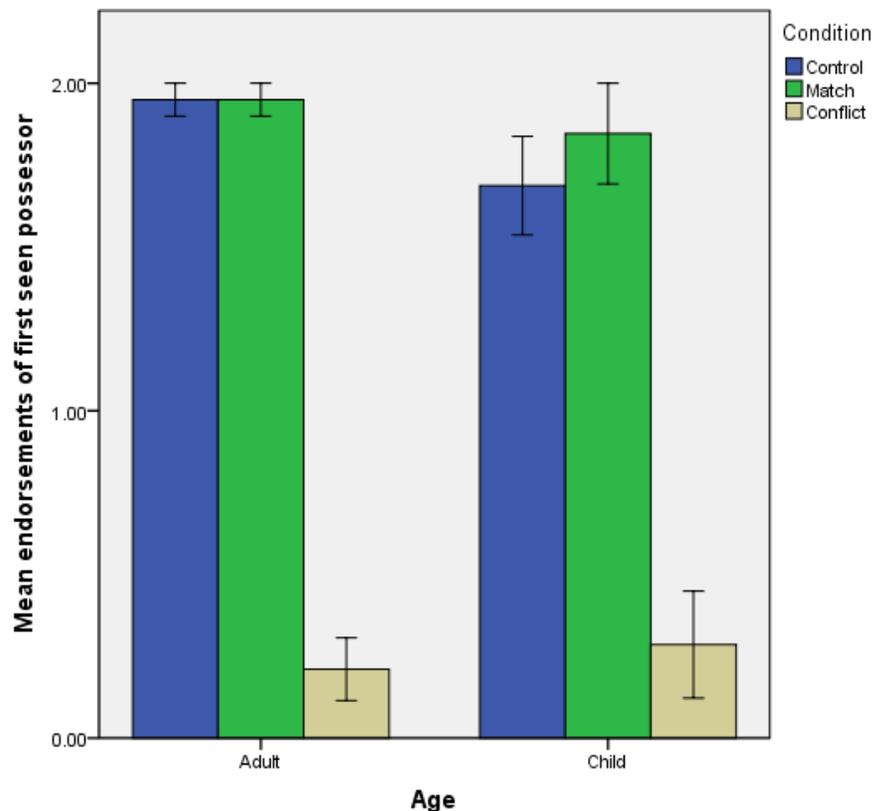


Figure 3.2: Mean endorsements of the first seen possessor by adults and children.

Data from children and adults were then submitted to a 2 (age group: adults v 3-4 year-olds) x 3 (condition: control, match and conflict) ANOVA. This revealed a significant main effect of condition, $F(2, 96) = 142.15, p < .01$. The main effect of age, $F(1, 96) = 1.18, p = .281$ and the age x condition interaction, $F(2, 96) = 1.22, p = .301$, were not significant. A Tukey post-hoc analysis revealed no significant difference between the selection of the first seen possessor as the owner in the control and match conditions ($M = 1.83; M = 1.91$ respectively, $p = .76$). It was expected that there would be little to no difference between the results from these two conditions. In the match condition the first seen possessor was also the constructive possessor, and so most likely to be chosen as the owner. In the control condition there was no constructive possession, and so again it was expected that the first seen possessor would be chosen as the owner, leading to similar results in each of these two conditions. In the conflict condition participants selected the first seen possessor as the owner significantly less often than in the other two conditions ($M = .24, p < .01$).

Data from the adults and the children were then analysed separately. The results from the adults were then submitted to a one way analysis of variance (ANOVA), which showed a significant main effect of condition, $F(2, 56) = 215.77, p < .01$. In the control and match conditions the mean endorsements of the first seen possessor were identical ($M = 1.95$). However a Tukey post-hoc analysis demonstrated that the first seen possessor was chosen as the owner significantly less often in the conflict condition than in the match and control conditions ($M = .21, p < .01$). In the control and match conditions adults selected the first seen possessor as the owner of the object more than would be expected at chance levels, $t(19) = 19, p < .01$; $t(19) = 19, p < .01$ respectively. In the conflict condition adults selected the constructive possessor as the owner of the object more than would be expected if decisions were at chance, $t(18) = -8.22, p < .01$.

Results from the analysis of the children's data were similar, with a significant main effect of condition, $F(2, 40) = 29.55, p < .01$. As expected a Tukey post-hoc analysis demonstrated no significant difference in the endorsements of the first seen possessor between the control and match conditions ($M = 1.69; M = 1.85, p = .75$ respectively). The results from the conflict condition showed that children chose the first seen possessor as the owner significantly less often than in the control and match conditions, ($M = .29, p < .01$). In the control and match conditions children selected the first seen possessor as the owner of the object more than would be expected at chance levels, $t(15) = 4.57, p < .01; t(12) = 5.5, p < .01$ respectively. In the conflict condition children chose the constructive possessor as the owner more often than if decisions had been based on chance, $t(13) = -4.37, p < .01$.

3.4 Discussion

The present experiment investigated whether adults and children would take constructive possession into account in ownership decisions, or whether judgments would be based on who was seen possessing an object first. It was hypothesised that if children and adults do reason about ownership by reconstructing the history of the object, in order to establish who had prior contact with the object before the scenario began, then both children and adults would base their judgments on constructive possession, and judge the character who constructively possessed the object as the owner, rather than the first seen possessor. The premise upon which constructive possession is based includes an inference that at one point in the past possession has indeed occurred, and that the owner has the ability and intention to exercise control over the object. In order to establish these facts the history of the object must be reconstructed.

The results of the current experiment support this hypothesis. In the control condition, where there was no constructive possession, and in the match condition where the first seen possessor was also the constructive possessor, both adults and children appealed to the first seen possessor as the owner of the objects. However in the condition where the first seen possessor was in conflict with the constructive possessor adults and children chose the constructive possessor as the owner of the objects significantly more often than the first seen possessor.

These results, particularly the conflict condition, contradict the claims Friedman and Neary made based on the results from their serial possession studies, (2008). In these studies the authors proposed that ownership is directly inferred from first seen possession, and that ownership decisions are made using a first possessor heuristic. In their studies children aged 3-4- years-of-age chose the first character they saw possessing an object as its owner. In a study with adults (Friedman, 2008) the results were again interpreted as demonstrating that ownership is directly inferred from first seen possession. In this study, even when objects were sex stereotyped, and a boy was seen as the first possessor of a feminine object, adults still chose the first seen possessor as the owner of the object. The results from their studies were interpreted as supporting the theory that ownership is directly inferred from first seen possession, based on a first possessor heuristic or rule; the first seen possessor is the owner of the object. First seen possession can indicate ownership as it is a good source of information as to who is most likely to have had possession of an object in the past, and therefore who is most likely to own it. However when Friedman & Neary, 2008 talk of the first possessor heuristic they are not claiming that that first seen possession is used as part of the historical narrative, but rather that ownership can be directly inferred from first seen possession, something the findings from the current study contradict.

These results also challenge the association account of ownership put forward by Blake and Harris (2011). If ownership at a basic level is based on visual associations then it would follow that the character first seen possessing the object in the stories should be deemed to be its owner, as a visual association is made between them and the object which they are holding. If seeing a second character holding the object caused the visual association to be overwritten, a theory which Blake and Harris (2011) do not support, claiming that the initial visual representation is a robust one, then the second possessor should have been chosen as the owner in all of the stories, not just the stories in which constructive possession did not match first possession. With this said it is difficult to explain the results using the association account of ownership.

The findings of this experiment fit more parsimoniously with the historical account of ownership (Friedman, Neary, Defeyter & Malcolm, 2011). In the control condition there was no constructive possession. The history of the object could have been reconstructed to ascertain who had prior ownership of the object. However the simple first seen possession account (Friedman & Neary, 2008), or the association account of ownership could also account for the results in this condition. In the match condition the first seen possessor was also the constructive possessor, therefore again whilst a reconstruction of history may lead to an assumption that this character had prior possession of the object before the story began, the two previously mentioned accounts of ownership could also explain these findings. The historical narrative accounts for the results observed in the conflict condition in a more successful way than the simple first seen possession, and the association accounts of ownership. In the condition where constructive possession was in conflict with first seen possession reconstructing the history of the object may lead one to assume that, because the story is set in the bedroom of the second possessor, they had

possession of the object at some point in the past before the story began. The first seen possessor may have walked into the bedroom of the second possessor and, most likely with the permission of the second possessor, picked up the object to play with it. Alternatively the character who was the second possessor of the object may have lent it to the other character to play with before the scenario began, and this scenario shows the character returning it to its rightful owner. Any of these reconstructions of history would have led people to reason in line with constructive possession and choose the second possessor as the owner of the object. An alternative way in which the story in this condition could have been interpreted is that the first seen possessor brought the object into the bedroom of the second possessor and therefore had possession of it before the story began. If this was the case then the first seen possessor is also the owner of the object. It is interesting to note that neither adults nor children reasoned in this way, but instead chose the second possessor of the object as the owner in this condition, deeming them to have constructive possession of the object. The results suggest that both adults and children reason in line with the legal doctrine of constructive possession, despite the fact they are either entirely unaware of the existence of this doctrine, or at the most possess a very vague understanding of the concept.

Alternatively rather than taking constructive possession into account in the stories, both adults and children could have applied a brute rule to the scenarios such as, "Any object located in a person's bedroom belongs to them." If this was the case then these findings do not reflect the use of either a first seen, or first constructive possessor, as children and adults do not need to reason in this way. In order to address this issue another experiment was conducted in which constructive possession was not established using a bedroom setting. As in Experiment 3, in this experiment participants could use the simple first possession account of ownership to

guide their decisions of who owns the object. This would lead them to choose the first character they saw using the object as its owner. Alternatively participants could base their decisions on the association account of ownership, choosing the first character with whom a visual association is created; in this case the character who first used the object. In this instance however it was hypothesised that, even when not using a bedroom setting, both children and adults would choose the constructive possessor of the object as the owner, having reconstructed the history of the object, to infer that this character had the power and intent to exercise control over the object, and had at some point in the past possessed it themselves.

3.5 Method

3.5.1 Design

The study followed a 2 x 3 between-subjects factorial design. Factor 1 was Age which had two levels, adults and children. Factor 2 was Condition which included three levels; control, match and conflict. The dependent variable was whether the first or second physical possessor of the object was chosen as its owner.

3.5.2 Participants

Sixty adults aged 18–60 years and 33 children between the ages of 3 and 4 years-of-age participated in this study. Adults were recruited from Northumbria University and were white middle class. Children were recruited from primary schools in the North East of England serving mainly white middle class backgrounds. This age group was chosen to mirror the age group chosen in Experiment 3. Participants were

randomly assigned to one of three conditions according to age. In the control condition there were 20 adults (M = 32 years 8 months, range 18 years 7 months – 60years) and 11 children (M = 4 years 6 months, range 3 years 8 months – 4 years 8 months). In the match condition, there were 20 adults (M = 24 years 4 months, range 18 years 3 months – 55 years 7 months) and 11 children (M = 4 years 3 months, range 3 years 8 months – 4 years 9 months). In the conflict condition there were 20 adults (M = 24 years 8 months, range 18 years 3 months – 43 years 5 months) and 11 children (M = 4 years 2 months, range 3 years 5 months – 4 years 8 months) (see table 3.2 for number of participants in each group).

Table 3.2: Number of participants (by age group) for the control, match and conflict conditions.

Condition	Adults	Children
Control	20	11
Match	20	11
Conflict	20	11

As with Experiment 3 ethical approval was granted by the Northumbria University School of Life Sciences Ethics Committee. Written informed consent was obtained from the adult participants (see Appendix 2 & 3) before any testing took place. Prior to the commencement of any testing of child participants at primary schools the head teacher consented to the experiment taking place (see Appendix 1). Written, informed consent was also obtained from the parents of the participating children (see Appendix 2 & 3), and on the day of testing if the child seemed uncomfortable, or said they did not wish to take part, and did not give their verbal consent, they were not involved in the study. Children were given child friendly pens and pencils for taking part and staff at the school were given boxes of chocolates as a token of thanks.

Adults were immediately debriefed after the experiment. Children were verbally debriefed and thanked for taking part and a debrief was given to the parents when they arrived to collect their children from school (see Appendix 4).

3.5.3 Materials

Adults and children were presented with 2 simple ownership stories about a boy and girl possessing an everyday artefact; a book or a mug. Each story was 4 pages long. The first page of the story depicted two characters standing side by side with a hat between them, and one of the artefacts in the hat, (see Appendix 5.4 for full examples of stories used). In these stories the artefact always began in the hat. In the control condition the hat was referred to as “a hat.” In the match condition the hat was described as belonging to the first possessor, and the object was placed inside their hat. In the conflict condition the hat was described as belonging to the second possessor, and the object was placed inside their hat. The following pages showed one character possessing the object, followed by the other character possessing it. The final page showed the two characters standing side by side with the hat between them, and the object placed above the hat (Example stimuli of the match condition is shown in Figure 3.3).

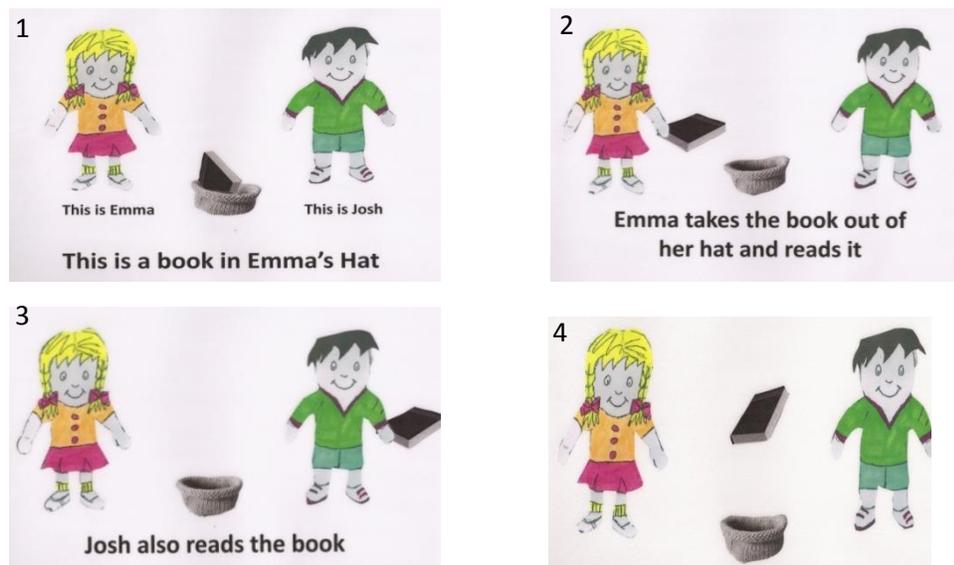


Figure 3.3: Example stimuli used in the match condition of the constructive possession study where the object is placed in a hat.

3.5.4 Procedure

In each condition adults and children received two trials. Adults were tested individually in a quiet room within the Cognition and Communication Laboratory in Northumbria University. Adults were given the story booklets and answer sheets and were left alone to read the stories and complete the answer booklets (see Appendix 6 for example answer booklet). Children were tested individually in a quiet corner of their classroom or a small room adjoining the classroom. Although the words were printed on the stories, given the age of the children, the stories were read out to them. Children were also monitored to ensure they were on task and engaging with the story. In each condition each page of the story was read to the child. In this study when the fourth page was reached the children were asked the ownership question, “Whose is the mug/book?” If the child said “I don’t know” or did not answer they were recycled through the story and asked the ownership question again. If after the second time of hearing the story the child still said “I don’t know” or failed to give an answer the child was moved on to the next story. Only one child was recycled through both stories twice before they gave an answer. The gender of the first seen possessor, whether the girl character was on the right hand side of the object in the final picture and boy on the left, or the reverse, and the order in which the stories were presented was counterbalanced across participants.

3.6 Results

This study was scored identically to Experiment 3. In each condition for each story participants received a score of 1 each time they selected the first seen possessor of the object as its owner, and a score of 0 each time they selected the

second possessor as the owner (maximum score 2). All children answered all the of the ownership questions, and as such all their data was included in the analysis. One adult in the control condition and one adult in the conflict condition chose both characters as the owner of the object. As such they were excluded from analysis. Adults' and children's mean endorsements of the first possessor as the owner of the object according to condition are shown in Figure 3.4.

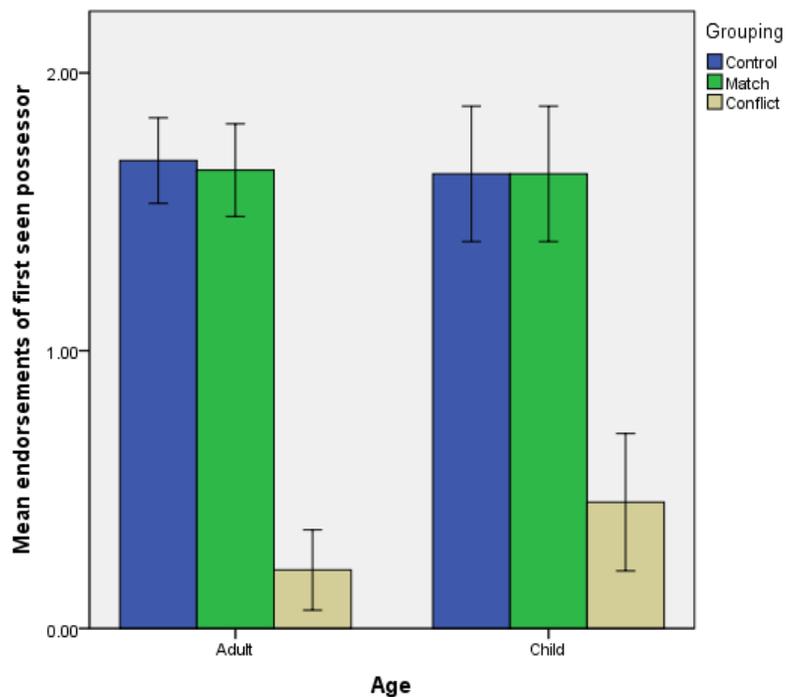


Figure 3.4: Mean endorsements of the first seen possessor by adults and children.

The data from adults and children were submitted to a 2 (age group: adults v 3-4 year-olds) x 3 (condition: control, match & conflict) ANOVA. This revealed a significant main effect of condition, $F(2, 85) = 30.21, p < .01$, but no significant main effect of age, $F(1, 85) = .14, p = .71$, and no significant age x condition interaction, $F(2, 85) = .33, p = .72$. A Tukey post-hoc analysis revealed no significant difference between the endorsements of the first seen possessor between the control and match conditions ($M = 1.67; M = 1.65$ respectively, $p = .99$). Analysis showed that the first

seen possessor was chosen as the owner significantly less often in the conflict condition than in the other two conditions ($M = .3, p < .01$).

As in Experiment 1 the data from the adults and the children were then analysed separately. A one way ANOVA on the data from the adults demonstrated a significant main effect of condition, $F(2, 55) = 28.87, p < .01$. A Tukey post-hoc analysis revealed no significant difference between the control and match conditions in adults' endorsements of the first seen possessor as the owner of the object, ($M = 1.68; M = 1.65, p = .99$, respectively). Adults selected the first seen possessor as the owner of the object significantly less often in the conflict condition than the control condition ($M = .21; M = 1.68, p < .01$) and less often in the conflict condition than the match condition ($M = .21; M = 1.65, p < .01$). Further analysis also showed that adults endorsements of the first seen possessor as the owner of the object in the control and match conditions exceeded the chance score of 1, $t(18) = 4.4, p < .01; t(19) = 3.9, p < .01$ respectively. In the conflict condition adults based their decisions on constructive possession at rates greater than chance, $t(18) = -5.46, p < .01$.

The children's data were also submitted to a one way ANOVA which also revealed a significant main effect of condition, $F(2, 30) = 7.75, p < .01$. The mean endorsements of the first seen possessor were identical in the control and match conditions ($M = 1.64$). However like the adults, children selected the first seen possessor of the object as its owner significantly less often in the conflict condition than in the other two conditions, ($M = .46, p < .01$). In the control and match conditions children's endorsements of the first seen possessor as the owner of the object exceeded the chance score of 1, $t(10) = 2.61, p = .03; t(10) = 2.61, p = .03$ respectively. In the conflict condition children chose the constructive possessor at rates exceeding the chance score of 1, $t(10) = -2.21, p = .05$.

3.7 Discussion

It was hypothesised that when making ownership judgments, both children and adults would reconstruct the history of the object and choose the constructive possessor as the owner of the object, having deemed them to have both the power and intent to exercise control over the object, and to have possessed it at some point in the past. The results of this experiment did support the hypothesis, and were similar to the results of Experiment 3, giving more support to the possibility that children and adults appeal to the history of an object when making ownership decisions, and also ruling out the possibility of ownership decisions being based on a brute rule. When making decisions of ownership in the control condition, where there was no constructive possession, participants chose the character who used the object first, more often than the character who used it second. This suggests that when no other competing information regarding ownership is available, adults and children base their decisions on first seen possession. In the match condition, where the first possessor of the object was also the constructive possessor, participants chose this character as the owner of the object more often than the character who used it second. However when making ownership judgments in the conflict condition, where the second possessor was the constructive possessor, participants chose the second character as the object's owner more often than character who was seen possessing the object first. These findings provide further evidence that the results obtained in Experiment 1 were not based on a brute rule of, "any object located in a person's bedroom belongs to them." Participants in this study took constructive possession into account when it was established using a hat rather than a bedroom.

These results challenge the claims of Friedman and Neary (2008), and Friedman (2008) that ownership is directly inferred from first seen possession. Whilst

this theory could account for the results in the control and match conditions, where there was no constructive possession, or where the constructive possessor was also the first seen possessor, this was not the case in the conflict condition. In the conflict condition first seen possession was pitted directly against constructive possession. However, rather than inferring ownership from first seen possession, participants based their ownership decisions on constructive possession, choosing the second possessor as the owner of the object.

The association account of ownership (Blake & Harris, 2011) can account for some, but not all, of the results found in this experiment. In the control condition children and adults could have made a visual association between the first seen possessor and the object they were possessing. This visual association is resistant to being overwritten, and as such subsequent possession by the second possessor does not challenge the first seen possessor's claim of ownership. Results in the match condition, where the first seen possessor also had constructive possession of the object, can also be explained using the association account. When children saw the character remove the object from the hat and play with it, a visual association could have been made between this character who was the first seen possessor, and the object. Again this visual association was robust, and as such resisted the challenge from any visual association made between the object and the second character, who also used it. The first seen possessor is therefore chosen as the owner of the object. However in the conflict condition, where the first seen possessor was not also the constructive possessor of the object, this character was not chosen as the owner of the object, despite being seen possessing the object first. The association account of ownership could account for the results if the initial association was based on verbal, rather than visual information. On the first page of the story neither character is seen possessing the object, however it is pictured in a hat and

children and adults are informed that the hat belongs to the second seen possessor. This information may have led participants to create an association between the object within the hat, and the person who owned the hat. If this association resisted being overwritten by the subsequent visual association between the first possessor and the object then this would explain why the second possessor was chosen as the owner. A problem which arises with this explanation however is that Blake and Harris purport that associations made based on verbally encoded information are less robust than visual ones, and more easily overwritten. They also state that children below 4-years-of-age have not overcome their bias to privilege visual association over verbal association when these two sources of information are in conflict (Blake, Ganea & Harris, 2012). Results from their study also suggest that even when children are able to privilege verbal information this information needs to explicitly inform them of who owns the object. In the current experiment the verbal information told participants who owned the hat the object was placed in, but gave no information about who owned the object in question. With this in mind then any initial association made on the basis of verbal information, would most likely be overwritten when the stronger visual association, between the object and the first character to use it, became evident further on in the story. If children and adults were using the association account of ownership to decide who owned the objects then they should have chosen the first seen possessor in the conflict condition, as the visual association was created between this character and the object. The fact that both children and adults chose the constructive possessor, as the owner of the object, in the conflict condition, provides a challenge to the association account which it struggles to accommodate.

The results of this experiment, in particular the results from the conflict condition, strongly support the historical account of ownership. As mentioned above, the results of the control condition could be a result of participants tracing the history

of the object to ascertain who had prior contact with it. However the simple first possession, or the association account of ownership, can also account for the results in this condition, as the first possessor was the owner of the object. In the match condition the constructive possessor was also the first possessor of the object, and as such it is difficult to tease apart history and first possession or association, when deciding what ownership judgments were based on. In the conflict condition the simple first possession account and the association account are in competition with the historical account, as first possession is in direct conflict with history. In this condition the hat provides information which allows the history of the object to be reconstructed. Whilst it is not common for people to store objects they own in their hat, it is less likely that someone would have placed an object they owned into a hat they didn't own, or placed an object they didn't own into a hat they owned. Therefore a reconstruction of the history would most likely lead to an assumption that the person who owns the hat also owns the object, and put it in the hat at some point in the past, before the scenario began. On this basis then the constructive possessor, and owner, is the character who used the object second. The second possessor may have given the first possessor permission to remove the object from the hat and use it, hence why they are pictured using the object first. However this first seen possession does not amount to a legitimate claim of ownership over the object.

3.8 General Discussion

Early research into ownership decisions involved serial possession scenarios, where one character possesses an object, followed by a second character possessing it. In neutral conditions where no other competing information is available children and adults choose the first possessor of an object as its owner (Friedman &

Neary, 2008). Again it should be acknowledged that this is the first seen possessor, rather than the character who may have had possession at some point in the past before the scenario began. The purpose of the current experiments was to investigate how adults and children make ownership decisions about objects which are not in a person's direct physical possession. Specifically the aim of these experiments was to establish whether, in instances of constructive possession, children and adults reason in line with the law, and choose the first constructive possessor as the owner of the object, or whether they must see a character possessing an object first to attribute ownership to them.

If children and adults use constructive possession to determine ownership then it would be expected that in the control and the match conditions adults and children would choose the first possessor as the owner of the object. If adults and children were reasoning in line with constructive possession in the conflict condition it would be assumed that they would choose the second seen possessor as the owner of the object, as this character was the constructive possessor. As illustrated in figure 3.2 and 3.4 this was the case in Experiment 3 and 4, with decisions being made in line with the doctrine of constructive possession. In both experiments the conflict condition, where the first seen possessor was not also the constructive possessor, was perhaps the purest test of constructive possession. In Experiment 1 and 2, when making ownership decisions in the conflict condition, the constructive possessor, and not the first seen possessor, was overwhelmingly chosen as the owner of the object. The present findings show that adults and children will make ownership decisions in line with constructive possession, as long as the information available to establish this possession is salient. It is interesting to note that children and adults will intuitively reason in line with the law despite the fact they are, in almost all cases, unaware of how constructive possession operates in courts of law.

These findings contradict the early findings of Friedman and Neary (2008) and Friedman (2008), who interpreted their findings as evidence that both children and adults directly infer ownership from first seen possession. Their studies were set against neutral backgrounds, with no other competing ownership information. In instances like this, where there is no other information available, the first possessor is chosen as the owner of the object. Rather than this being a first possessor heuristic, from which ownership is directly inferred, first seen possession may be used in scenarios such as this as it is the best clue as to who had prior possession of the object before the scenario began, and therefore who is most likely to have a claim of ownership over the object. Whilst not the interpretation that Friedman and Neary (2008) favoured, this theory is given support by the findings in the conflict conditions of the current experiments. The control condition in the current experiments was very similar to the conditions in Friedman and Neary's studies and produced very similar results. However results, particularly from the conflict condition, where competing information was available to participants, give support to the historical account of ownership rather than a simple first possession account, in which ownership is directly inferred from first seen possession.

The association account of ownership can explain some of the results observed in the current experiments. However the results raise other questions and issues which this account struggles to reconcile. In the match conditions and the control conditions, where the owner is the first seen possessor of the object, the association account can explain why this character is chosen as the owner of the object. If a robust visual association is made between the first seen possessor and the object in question, which then resists being overwritten by a second visual association, the first seen possessor will be chosen as the owner of the object. There is however no explanation in the association account as to why it is that the first visual

association does not get overwritten by the second visual association, and why ownership decisions would be based on the first visual association in the first place. Furthermore in the conflict conditions of Experiment 3 and 4 the second possessor was overwhelmingly chosen as the owner of the object, a finding which the association account of ownership cannot explain. If attributions of ownership require a visual association, and intentional use of an object, then in all conditions, including the conflict condition, the first seen possessor should be chosen as the owner of the object, as a visual association is made with this character first. The fact participants choose the second seen possessor of the object as the owner, makes it more likely that ownership had been attributed to them on the basis of constructive possession, rather than association, with participants inferring that at some point in the past the second possessor had prior contact with the object and a legitimate claim of ownership over it.

The findings, from Experiment 3 and 4, support the historical account of ownership. The historical account, as discussed earlier in the chapter, states that when faced with an ownership decision adults and children will use the information they have to reconstruct the history of the object to determine who legitimately acquired ownership of it in the past. Unless information is apparent to suggest a subsequent legitimate transfer of ownership following the initial acquisition, this person is assumed to be the owner. In the match and control conditions when information was provided to help reconstruct the history of the object decisions of ownership were made in line with history. In the conflict condition, where the first seen possessor was not the constructive possessor, both adults and children chose the constructive possessor of the object, rather than the first seen possessor in Experiment 3 and 4.

3.9 Concluding remarks

In conclusion the results from the experiments suggest that, despite having little or no knowledge of the doctrine of constructive possession, both adults and children intuitively reason in line with the law when it comes to making ownership decisions, if the information to establish constructive possession is salient. For example in the case of *People v Vander Heide* (1920), whilst the defendant did not have actual possession of the alcohol in question, the baggage labels he had on his person were enough for the court to decide he had constructive possession of the object, despite the fact someone else was possessing it. In the conflict conditions of the scenarios in the current experiments adults and children attributed ownership to the constructive possessor of the object, despite the fact the first picture they saw depicted a different character with actual possession of the object. In the case of *People v Vander Heide* (1920) the luggage tags connected him to the alcohol, establishing ownership through constructive possession. In these experiments the bedroom and the hat of the second possessor connected them to the object, giving them a claim of ownership through constructive possession. Similarly in the case of *State v Parent* (1923), despite the fact the defendant claimed no knowledge of the alcohol, he was charged with constructive possession as he had both the ability to exercise control over the object and the intention to do so. In these experiments participants could have reasoned in a similar way about the constructive possessor, judging them to have the ability to exercise control over the object, demonstrated by the fact they were allowing the other character in the story to play with the objects in their room. One difference between the current experiments and the cases in law is that in the current experiments the constructive possessor was seen possessing the object at some point in the scenario, either as the first or second possessor,

depending on the condition they saw. In the aforementioned cases in law the constructive possessor was never seen physically possessing the object but was charged with owning it nonetheless. However the fact that the constructive possessor was seen possessing the object in the current experiments does not detract from their claim of ownership based on constructive possession. In the conflict condition, in order to attribute ownership to the constructive possessor, participants had most likely made an ownership decision before they saw the second character physically possessing the object. If decisions had been based on something other than constructive possession, e.g. a visual association or a direct inference from first seen possession, the second possessor would not have been chosen as the owner of the object in the conflict conditions, which was not the case. Therefore the subsequent possession of the second possessor was more likely to strengthen an already established claim of ownership, based on constructive possession, than to indicate a claim of ownership in itself.

The present experiments challenge the findings of Friedman and Neary (2008), who suggested that, when making ownership decisions, adults and children will use a first person heuristic where ownership is directly inferred from first seen possession. The current experiments have made it clear that first seen possession may be a good clue as to who had past contact with an object, and therefore who may have a claim of ownership over it. However the results from the conflict conditions have demonstrated that ownership is not directly inferred from first seen possession, unless there is no other information available.

Both the simple first possession and the association account of ownership can explain the results in the control and match conditions. However it is the historical account of ownership which more comprehensively accounts for the variety of results found, particularly in the conflict conditions. Whilst undoubtedly associations between

people and objects are made, it seems that other information, such as constructive possession, is taken into account, and this information is used to reconstruct the history of the object, to discover who initially possessed the object before the scenario began.

Whilst these experiments did involve physical possession at some point, the question of how adults and children make ownership judgements about objects which are not directly possessed can be answered from the results. When objects are not directly possessed it seems that both children and adults may attempt to trace the history of the object in order to discover when the object was physically possessed, by whom, and whether this person had a legitimate claim of ownership over it. It should be noted that, whether objects were directly possessed from the beginning of the experiment (Experiment 3), or whether they began in a hat, rather than in the possession of a character (Experiment 4), ownership decisions were made in the same way; through a reconstruction of the history of the object. Reconstructing the history in this way allows ownership decisions to be made about objects which are not directly physically possessed, or which are in the possession of others. Identifying the character most likely to have had prior contact with the object will most likely lead to finding the owner, rather than just basing decisions on visual associations or directly inferring it from first seen possession.

Chapter 4: The Role of History in Ownership Decisions

4.1 Introduction

The findings from the previous chapter demonstrate that when making ownership decisions about which specific person owns a specific object, when information other than first seen possession, or first visual association is available, both adults and children take this other information into account. The simple first possession account of ownership (Friedman & Neary, 2008), which states that ownership is directly inferred from first possession struggled to explain the findings from Chapter 3, and it is also unlikely that ownership decisions are based on a visual association account of ownership (Blake & Harris, 2011). The account which most parsimoniously explains the findings from the previous chapter, and which may underpin some ownership decisions, is based on historical reconstruction (Friedman, Neary, Defeyter & Malcolm, 2011). Adults and children may trace the history of an object to ascertain who is more likely to have had past contact with it, and who may have acquired the object in a way which legitimately grants them ownership of it. At present there is a paucity of information regarding the role of history in ownership judgments, which makes it difficult to assess how important history is in these decisions. However evidence does exist that adults and children take history into account in other decisions involving artefacts. Children consider history when naming pictures and objects and also when making decisions about object functions. The fact that children are able to consider history in decisions of this nature suggests that history may also play a role in some ownership decisions. As such it is important to review literature regarding how history is taken into account in object naming and function.

Both adults and children can take history, or more specifically, the intention of the designer of an object, into account when naming and categorising objects. The design stance is a theory which purports that when categorising objects it is the

designer's original intentions which lead this process, as they determine what an artefact is and what it does. Bloom (2000) stated that artefacts are not merely the sum of their perceptual parts, but have deeper causal properties which explain their superficial features. Whilst it is widely accepted that the designer's intent determines categorisation of the object, there are different theories on exactly what the intention relates to. Some authors (Matan & Carey, 2001) argue that it is the original intended function of an artefact which determines its categorisation. The object should be categorised in line with whatever function the creator intended it to have when it was made at some point in the past. Bloom (1996) however disagrees with this, focusing not on what function the object serves, but rather on what the designer intended the object to be when it was made. For example a chair is not categorised as a chair because it functions as something to sit on, but rather because it was created with the intention of being a chair, and has turned out as the creator intended it when they began the creation. Bloom (1996) acknowledges the importance of other salient features such as shape and function but views these as cues to the intention of the designer, rather than cues to the categorisation of the object. If a creation looks like other chairs, and functions as something to sit on, then it would make sense to assume that when the designer made it they intended it to be a member of the same kind. If however the perceptual cues such as size, shape and texture point to it being intentionally designed to be something different, e.g. a bench and not a chair, then it can be assumed that the designer made it with the intention of it belonging to the category of bench and not chair.

The design stance provides evidence that adults and children are able to use perceptual and functional cues of objects. However if Bloom's theory (1996, 2000) is correct then adults and children do not just base decisions of categorisation on what they see in front of them, but rather they use this information to infer the intent of the

designer when the object was created at some point in the past. Using history in ownership decisions works in a similar, but not identical way. Ownership decisions based on history involve an inference of who owns an object, based on the creation of a historical narrative from perceptual information. In order to reconstruct the history of an object, both adults and children must appreciate that ownership is an invisible construct, and not one that can be reduced down to perceptual or functional features. The properties of an object can help to retrace the history to determine who has a claim of ownership, but in themselves they cannot determine who owns a particular object, in the same way that Bloom claims these features alone do not determine what category an object belongs to.

Before investigating the role of history in ownership judgments it is important to review the literature relating to the role of history and intention in object categorisation judgments. An important point to note is that whilst decisions of categorisation and ownership both involve “history,” often in categorisation studies the historical information is given to participants, and an assessment is made as to whether they use this historical information to infer the intent of the creator. In ownership decisions participants are required to construct a historical narrative, based on the perceptual cues in front of them, rather than being informed about it. For example in a scenario where a girl plays with a ball and then a boy plays with it, reconstructing a historical narrative may help in the decision of who owns the ball. The boy’s possession of the ball does not suggest that he possessed it before the scenario began, or earlier acquired it in a way which legitimately grants him ownership of it. In the scenario the boy also possesses the ball after the girl. The girl however starts with the ball, implying that she possessed the ball before the scenario, and may have earlier acquired it in a way which legitimately conferred ownership. Based on this reconstruction the girl is then chosen as the owner of the ball because her first

possession is informative about the past (Friedman, Neary, Defeyter & Malcolm, 2011).

The current investigations into the role of history in ownership judgments in this chapter are not an assessment of whether historical information is used in decisions when it is explicitly provided, but rather whether the history of an object can be inferred to inform ownership decisions. However if children and adults consistently take history into account, and base their decisions on the intention of the creator when categorising objects, this would increase the plausibility that children might also consider history in other judgments such as ownership judgments.

4.1.1 The Role of History in the Naming of Pictures and Objects

A study by Gelman and Ebeling (1998) investigated whether children and adults consider intention when naming pictures that have been accidentally or intentionally created. In this study children and adults were provided with historical information about the origins of the drawing, and were tested on whether they used this historical information in their judgments. Adults and 3-years-olds heard stories about how objects in a picture had been created. In one condition, the drawings were described as being intentionally created (e.g. John was painting in art class). In the other condition, the drawing was described as being the result of an accidental action (e.g. a spillage of paint). The object depicted in the picture was not mentioned at any point. Participants were then shown the drawing they had been told about, and were asked, “What is this?” Children and adults named drawings on the basis of the shape of the object significantly more often when the shape was a result of intention rather than an accident. For example participants were more likely to say a drawing depicted a bear when it had been intentionally created. When the drawings were a result of an

accidental action participants were more likely to name the materials mentioned in the story (e.g. paint), or give other responses such as, “I don’t know.” In this experiment, participants were not asked to construct the history of the pictures, but were expected to use the history they were given, about the creation of the drawing, to infer whether the shape of the picture was intended or accidental, thereby taking the mental state of the artist into account in their decisions.

In a second study, the authors extended the age range to include children aged 2 years 5 months to 3 years 5 months. The procedure was identical to that of Study 1. The results were similar to those in the first study, demonstrating that even children as young as 2 years 5 months consider the intention of a creator, and use information about the history of an object to infer what the picture represented. If young children are capable of taking the history of an object into account when naming pictorial representations of objects, they may also be able to take history into account when making decisions regarding ownership.

A similar study by Gelman and Bloom (2000) examined whether intention plays a role in the naming of familiar artefacts rather than just pictures. The authors predicted that if children and adults believed an artefact to be the result of an intentional creation they would be more likely to provide a name for it. However, if the artefacts were deemed to have been accidentally created, children and adults would be more likely to give other types of descriptions, such as labelling the material it is made of. Adults and children aged between 2 and 6–years-old were randomly assigned to either the intentional or the accidental condition. They then heard stories of how artefacts were created. Participants were given some history about a girl named Jane who had broken her arm and had it in a cast. This information was given to explain why she was clumsy in the accidental condition, and imperfect in the intentional condition. In the intentional condition participants heard, for example,

“Jane got a newspaper and carefully bent and folded it until it looked just right. Then she was done. This is what it looked like.” In the accidental condition Jane was holding a newspaper then she dropped it by accident and it fell under a car. She ran to get it and when she picked it up this is what it looked like. For each item participants were told the story and then shown the corresponding object and asked, “What is this?” Even the youngest children were more likely to name an object when it was described as intentionally created. When the object was the result of an accident both adults and children were more likely to name the substance the object was made of, rather than naming the object itself. The authors note the importance of results due to the fact that in previous studies (Gelman & Ebeling, 1998) children have had to describe artwork, where intent is the key to understanding and interpreting what the artwork depicts. However in this study everyday artefacts were considered in the same vein, with both children and adults appealing to the intention of the creator when deciding what they were; a finding which shows the importance of intentionality is not limited solely to representations. Another finding of note was that despite the fact this study used three-dimensional objects, which provided participants with rich perceptual data, this did not affect participants’ naming of objects. For example even though the paper hat looked very like a hat in shape, it was only labelled as a hat when it was the result of an intentional action. This finding suggests that intentionality is not used in decisions as a last-resort, only when other information is not available. Participants could have relied on what the three-dimensional object looked like, when deciding what it was. For example perceptually the object in front of them looked like a hat so it would not have been incorrect for children to label it as such. However, even with this information available they chose instead to base their decisions on the historical information given to them about what the creator intended the object to be. This study does not demonstrate that children and adults are able to infer the history

of an object when making decisions about what an object is, as again participants were provided with historical information. However the results demonstrate that when deciding what to name an object adults and children consider historical data more important than the rich perceptual information right in front of them. If participants did not use the historical information they were provided with it would be unlikely that they could go beyond this and infer history themselves. However given that adults and children prioritise history over other available information they may be able to reconstruct a historical narrative themselves, based on perceptual information.

In another study Priessler and Bloom (2008) investigated whether 2-year-olds use the intention of the artist to understand different drawings. Two-year-olds were seated at a table with an empty box on their left and an opaque container with a lid on their right. They were given two novel objects to explore, after which the experimenter placed one of the objects in the empty box and one in the opaque container with the lid closed. Children received two trials, an “into” trial and an “away” trial. In the “into” trial the experimenter stared into the open box whilst drawing something on a piece of paper. In the away trial the experimenter stared at the wall behind the container which had the lid closed. During these trials the child could not see what the experimenter was drawing. The drawing was then labelled using a novel word e.g. a “spoodle.” The 2 objects were then removed from the boxes and placed either side of the child, and the child was asked to point to a “spoodle.” If children make use of the historical information available to them, taking the experimenter’s gaze into account to infer intent, they would choose the object that was in the open container in the “into” trial. In the “away” trial children should prefer the object from the closed box or the picture itself.

The results supported the predictions with children choosing either the picture or the object in the closed box in the “away” condition and choosing the object in the open

box in the “into” condition. The authors suggested that these results demonstrated that children as young as 2 could take into account intention and use this intention to interpret what a drawing depicted and naming the object in the drawing. They did however concede that an alternative explanation for the results could be that the experimenters gaze drew the attention of the children and they chose this item as this is what they had been paying attention to whilst the drawing was happening. Alternatively children could have assumed that the experimenter wanted them to choose the object they were looking at, and as such children made their decision based on this. If either of these theories explained the results then the results do not demonstrate children’s ability to infer intent based on cues available to them.

To rule out these concerns, a second experiment was carried out. This experiment was similar to the first experiment save that the experimenter, after a period of staring into the box or away from the box, found a previously hidden clipboard with a drawing of a “spoodle” instead of drawing the “spoodle” themselves. Results from this experiment demonstrated that children were not more likely to choose the object inside the box where the experimenter was looking before finding the drawing. When asked to point to a “spoodle” children only chose the object inside the open box when the experimenter was looking inside the box and drawing simultaneously (as in Experiment 1) rather than just gazing into the box. The results of this experiment demonstrate that children in Experiment 1 were not just choosing the object because their attention was directed that way, or because they felt the experimenter wanted them to choose a particular object. The results also show that children need cues to reveal the history of the picture, and the artist’s intent when they drew it, to interpret what it is. In Experiment 1 the gaze of the experimenter acted as a cue as to their intention whilst they were creating the picture. If the experimenter is looking at an object whilst drawing it is logical to assume that the picture they are

drawing is intended to be a representation of what they are looking at. However when children see only a finished picture (as in Experiment 2), and do not know the history of it, they cannot infer the intention of the artist, and as such cannot use this to interpret what the picture represents. If children use the cues available to them to trace history, and infer the intentions of artists at some point in the past, then children may also be capable of retracing or reconstructing the history of an object to infer who was likely to have past contact with the object. From this an inference can then be made about who may own it.

A study by Bloom and Markson (1998) more closely tested whether children could infer history, rather than just considering it in their decisions. Children aged 3- and 4-years-old were asked to complete 3 tasks. In the “drawing” task children were asked to draw four separate pictures including a balloon, a lollipop, themselves and the experimenter. After the child had completed other tasks for around 15 minutes the experimenter “rediscovered” pictures and asked the child to describe each one. Regardless of what the drawing looked like children named them based on what they had intended to draw when they created them in the past. They vehemently corrected the experimenter when they suggested the object may be something different, despite the fact their drawing of a balloon and a lollipop may have looked identical. The children also completed the “size” task and the “oddity” task. In the size task children were shown pictures drawn by a child their age with a broken arm. Children were told that due to the child’s broken arm, the pictures had not come out looking like what the child was trying to draw. Children were then shown sheets of paper with two different size shapes drawn on each sheet. Children were told the shapes depicted one of four pairs, either a mouse and an elephant, a dog and a house, a tree and a spider, or a flower and a bicycle. The experimenter pointed to each shape and asked the children to describe it. In the “oddity” task the children were again told the artist had a broken

arm. They were told the child drew some of one type of object and a one of another (e.g. three socks and a shoe). Children were then shown pictures of 3 ovals next to another oval that was oriented differently from the rest. Children were then asked to describe the drawings. If children used only the perceptual information available to them then they would struggle to describe the drawings, as they were not accurate depictions of any of the objects they were supposed to be. However if children could appeal to history, and infer what the child was intending to create, but was unable to do so due to a broken arm, then, regardless of the shape and size of the drawings, children could describe what the drawings were supposed to be. In the size and oddity task 4 year-olds correctly described the drawings, even though their shape bore no resemblance to what they were supposed to depict. Three-year-olds were above chance in the size task but not in the oddity task. This may have been because the premise of the oddity task was more complicated than both the size and drawing tasks.

In these studies children were given some historical information (the child had a broken arm) but were still required to make historical inferences of their own. The children were not told that due to the broken arm the child drew small shapes to represent small objects and larger shapes to represent larger objects. They were also not explicitly told that in the oddity task the child drew the three similar objects close to each other. Children were expected to infer this historical information themselves. The results demonstrate that children at this age can infer history, and use this history to deduce what the creator intended particular drawings to represent. The shape of objects is often an important factor in naming objects (Landau, Smith & Jones, 1996). In these studies the shape of the drawing did not match its real life counterpart, however this did not affect the descriptions the children gave of what the drawings represented. The reason for this, according to Bloom and Markson (1998), is that

when deciding what a picture represents children look for cues to infer the intention of the artist, and what they intended the drawing to represent when they created it at some point in the past. Appearance and shape are usually excellent cues to help do this, as Leyton (1989) points out the shape of an object can often give information about the object's history. Shape is a good cue to intention because it is unlikely that a person would draw something that looks like a specific object without the intention of it being a representation of that object (Bloom & Markson, 1998). However, this study shows that whilst shape is often a good cue to intent, if other information is available to explain the intent of the creator children will take history into account, and view the drawing in line with the intention of the artist, even if the shape is different. Whilst not asking children to construct the entire historical narrative relating to the scenario, the results suggest that children are not just capable of using historical information they are given, but also inferring history for themselves. If children are able to infer the aspects of the history they are not provided with, as in this study, then it may reflect an ability to construct an entire historical narrative when they are not given any explicit historical information, as is the case in some ownership judgments.

4.1.2 The Role of History in Decisions of Object Functions

The aforementioned studies examined the role that history plays in the naming of artefacts. Other studies examined how children determined, not the name of an artefact, but the function of it, and whether intention plays a part in this. Jaswal (2006) investigated whether children reasoned about an artefact's function on the basis of its label rather than what it looked like, if the label was given to it by the original designer of the artefact. The author was interested in whether 3- and 4-year-olds would use the

creator's label to determine the function of the artefact, even if the artefact looked like it should perform a different function.

Children were shown four sets of hybrid objects, such as a key-spoon which looked more like a key but was labelled as a spoon. Children heard the experimenter refer to the object as either, "something I made" or "something I found." Children were then asked to show the experimenter the function of the object. When the experimenter referred to the object as, "something I made" children were much more likely to base their inference about its function on the label given to it by the creator. However when the object had been found, children were as likely to base their function judgments on the appearance of the object as they were to base it on the label given to it by the finder. The results showed that 3- and 4-year-olds recognise that the creator of an object has the right to give it a name and ascribe a function to it. Jaswal (2006) suggests this may be evidence that children have begun to acquire the design stance, and know that artefacts are created intentionally for a purpose and to fulfil a certain function.

Children recognize that the label a creator gives to an object reflects the fact that, in the past, they created that object with the intention for it to carry out that function, in spite of its current appearance. When faced with a decision about what the object is they do not refer to its current appearance to guide their decisions, but rather appeal to the history of the object, and the function its creator meant it to perform when it was created at some point in the past. If children reason similarly about ownership, they should not just rely on who they see possessing an object at a given time, but instead should be influenced by a reconstruction of the history of the object to work out who has a legitimate claim of ownership of it.

An earlier study (Kemler Nelson, Herron, & Morris, 2002) investigated how adults and children aged 4-, 6-, 8-, and 10-years-old categorised objects that were

accidentally damaged or intentionally dysfunctional. Adults and children saw a novel artefact which had a particular function. They then saw two test objects, one of which was visibly damaged to the extent that it could no longer perform the same function as the novel artefact. The other was undamaged but could not perform the same function as the novel artefact. However it was constructed in a way so as to appear that it had been designed like that. Participants were told they were going to see some objects and would be asked about their names. The experimenter also casually mentioned that some of the objects had been broken. Participants were then shown the novel object (e.g. “a becket”), and its function was described. Participants were then given the two test objects, one by one, and were given an opportunity to explore them. Following this they were asked which of the two test objects was also “a becket.” Adults and 10-year-olds chose the accidentally dysfunctional objects more often than the deliberately dysfunctional ones, thus demonstrating that objects are named by appealing to the history of them, and inferring the functions that they were originally designed to do, regardless of whether they are still able to successfully carry them out. The younger children did not favour accidentally dysfunctional objects over the intentionally dysfunctional objects when the objects were novel. However when this experiment was repeated using familiar objects, children at all ages categorised the broken objects as members of the category they were originally intended to belong to before they were broken.

The tendency to categorise accidentally dysfunctional objects as members of their original category cannot be explained on the basis of current function or current appearance. The damaged object no longer functioned in a similar way to other members of the category, and in terms of appearance was no more similar to other category members than the intentionally dysfunctional object. For these reasons the authors claimed that children as young as 4-years-of-age were categorising objects

on the basis of the function which the designer intended the object to do when it was first created. In order to place an object into a category where it can no longer function in a similar way to other objects within that category, children and adults had to use the historical information that they were given, regarding some of the objects being broken, to ascertain that the parts of the object which meant it could no longer function as it should were not intended. They used this historical information to infer that when object was created it was created to function in a similar way to the other objects in the same category. The authors also point out that unlike other studies, where children are explicitly informed of design intentions, in this study children spontaneously inferred the intentions of the creator and what they intended the function of the artefact to be at some point in the past. If children as young as 4-years-old are able to spontaneously appeal to the history in this way, when categorising objects based on intended function, then they may be able to reconstruct the history of an object to ascertain who the true owner of it is.

Asher and Kemler Nelson (2008) also investigated whether 3 and 4-year olds take intentional design into account when considering the function of particular artefacts. Different objects were placed around a room and the child was encouraged to ask questions about any of the toys in whatever order they wished. Children were assigned to a plausible or an implausible condition. When children in the plausible condition asked a functional question about an object they were given information about a function that fitted with the objects prominent perceptual features. In the implausible condition children were given information about a function that did not fit with the perceptual features of the object, but nevertheless could still be performed by the object. Children were allowed to ask as many questions about the object as they wished. Results showed that the children in the plausible condition asked fewer follow up questions than children in the implausible condition, and a greater proportion of

the questions children in the implausible condition asked related to the function of the object. Results suggest that even though an object was able to successfully perform the function in the implausible condition children were not happy to accept that this was what it was originally designed to do, when the explanation was at odds with the salient perceptual features of the object. An alternative interpretation of results may be that, rather than appealing to the intent of the creator, children merely did not believe the answers in the implausible condition and therefore were unwilling to accept that this was what the object was originally designed to do. However Diesendruck, Markson and Bloom (2003) do not concur with this alternative explanation and point out the perceptual features of an object serve as cues to the intent of the creator of the object, when they designed this at some point in the past. They purport that if an object looks like a chair, and its main function is for people to sit on, then it was likely created to be a chair. The results of this experiment show that children have an understanding that if an object's current function has little to do with its appearance then it is unlikely that this is the function which was ascribed to it at some point in the past, by the creator. It is unlikely that a creator would design an object to include particular features which served no functional purpose.

Ownership decisions may work in a similar way to this. Ownership itself cannot be seen so cues must be relied on to infer who has a legitimate claim of ownership of an object. The way to establish this is to use the cues to appeal to the history of the object, and work out who, in the past, acquired the object in a way that affords them a legitimate claim of ownership over it. The results from this experiment show that, even from a young age, children are capable of using particular cues, such as appearance and function, to guide their historical inferences regarding the intentions of the creator of an object.

Barrett, Laurence and Margolis, (2008) investigated how adults from different cultural backgrounds use history in their function judgments. They also assessed whether history is relied on in function judgments when the artefact is no longer used in the way that the creator intended. The authors presented adults with written or verbal vignettes detailing the history of an artefact from its creation to what it was currently used for. The first part of the vignette described who the original creator of the object was, and the second part described the scenario in which the artefact came to change hands, and what the artefact was now used for. In the standard condition adults were given information about one person who finds the object and uses it for a new purpose. In the community condition information about how the new owner found it, and what it was used for, was identical to the standard condition, but the new use was described as what the whole community now used the object for. The study included adults from the UK as well as adults from a society in the Amazon region of Ecuador (The Shuar society). The two different groups were chosen because of their potential different approaches to objects. In the UK there are a large variety of objects made to fulfil a specific purpose. In this region of Ecuador there is a paucity of artefacts necessitating the use of one object for a number of different purposes, and a culture of employing whatever tools are available, even if they are only slightly effective. Barrett, Laurence and Margolis (2008) were interested as to whether these cultural differences would affect the decisions regarding the functions of the different objects, and whether current function would be chosen over original intentional design, particularly amongst the Shuar people, where using an object for only one specific function is rare.

Results showed that regardless of cultural norms relating to artefacts, subjects chose the original function, as determined by the creator, as the function of the artefact. The condition, standard or community, had no significant effect on the

results, with participants choosing the original function of the object significantly more often than the current function. The results suggest that adults relied on the history of the object they were presented with, and privileged this information over other available relevant information, to make their decisions about artefact function, regardless of whether the rest of the community now used the artefact for a different function to that which it was originally designed to do. Again it must be noted that the history in this study was explicitly given to the adults, and they were assessed on how they used this information in their function judgments, rather than whether they could construct a historical narrative based on the perceptual cues available to them. However the study demonstrates the importance of historical information, with adults privileging this over current use when making decisions about what an artefact's true function is. An obvious drawback to the study was the fact that it only involved adults, and as such it remains unknown how children would respond to the same questions when given explicit accounts of the history of the object.

Other studies testing how children and adults reason about the function of different artefacts have produced results which challenge the theory that children take the creator's intention into account, when making decisions about artefact function. In a study by Matan and Carey (2001) adults and children aged 4 and 6-years-of-age saw part of an artefact which could be interpreted as different things. For example, they saw a spout which could belong to either a tea-pot or a watering can.

Participants were then shown two pictures of different women, and were told one woman made the item for a specific purpose, e.g. to water her garden and the other woman was using it for a different purpose e.g. to make tea in. Once participants were clear about the different uses of the artefact, they were asked what it was, for example whether it was a watering can or a tea pot. Results showed that over 80% of adults categorization judgments were based on original intent, with the function of the

artefact being determined as what it was originally made for when it was created.

When asked to justify their decisions adults mainly appealed to the feasibility or origin of the object.

The authors concluded that when an object can be feasibly used for two conflicting purposes (i.e. a watering can and a tea pot) adults take original function to be more important than current function when determining artefact kind. Adults appear to appeal to the history of an object, and the function the object was originally designed for when it was created at some point in the past. The 4-year-olds and 6-year-olds chose the original function as the true function of the artefact more than would be expected at chance (66% and 86% respectively). However, in their justifications of why they had chosen the original function, 6-year-olds but not 4-year-olds appealed to the original purpose for which the object had been made. The justifications of the older children were similar, but not identical, to those of the adults, appealing to the origin or feasibility of the object to perform a particular function, but unlike adults also including the appearance of the object. The justification data of the 4-year-olds was markedly different, with children citing the use of the object as a reason for their choice (e.g. it is a Frisbee because it is to throw). This may suggest that children at this age do not appeal to the history of the object, and the original intended function, when making decisions about the function of artefacts. These outcomes challenge the results from the previously mentioned studies, and call into question children's ability to use history in their decision-making. If this is the case then there may be doubt as to whether children are able to consider history when reasoning about ownership. The authors suggested that 4-year-olds may not have referred to original function in their justifications because the memory demands of the task were too great and the information about intended function was not salient enough.

In order to test this, another experiment was carried out which was intended to reduce memory demands. Children were shown scenarios and given information about original function and current use. However children were also told at length about the process of creating the object, highlighting the importance of the original function, and making it more salient to the children. The 4-year-olds were also shown pictures of the objects, which were left on show throughout the experiment, to act as visual referents for children when making their decisions. The results however were not significantly different to the results of the previous experiment. The children categorized more artefacts by their original function, particularly when the original function of the object was mentioned first in the scenario. However, like the previous experiment, children at this age still referred to the appearance or use of the object when justifying why they had chosen that particular function, rather than alluding to the original intended function of the object.

The conclusion from this was that children at 4-years-of-age do not deem the original intended function of the artefact to be more relevant than other factors when deciding what an object is for, nor do they appeal to the creator's original intent when justifying the function they prescribed to the object. If these results truly reflect children's lack of ability to take history into account in decisions of artefact function then it may be that children also fail to consider history when making ownership decisions, choosing instead to base them on other factors such as first possession. Whilst children at both ages did not justify all their decisions in relation to the intent of the original owner, they did make decisions about what the object was according to original intended function. Failing to refer to the history of the object in their justifications may be more a reflection of an inability to clearly articulate their decision, rather than a reflection that history is not taken into account in these types of decisions. Barrett, Laurence and Margolis (2008) note that participants were given

minimal information about what was happening in the study, and as such had to base their decisions on their own assumptions. It may have been difficult for children to articulate their historical reasoning given that all they were shown was a small part of an object, which could have been one of two things. Children may have reasoned according to the history of the object and the intent of the original designer, but found it easier to cite more explicit aspects of the object, such as the appearance or use of it, when justifying their decisions. If this was the case then the results of this study do not rule out young children's ability to take the history of an object into account and use it in their judgments, including decisions of ownership.

There may however be some circumstances where children do not reason in line with the history of an object. In a study by Defeyter, Hearing and German (2009), adults and children aged 4-years-old were shown novel artefacts. In the conventional function condition participants were told that the object was designed by one person for a specific function, but was now used by everyone else for a different function. In the idiosyncratic condition participants were told that it was designed for one purpose but now someone else (rather than everyone else) uses it for something different. Following some questions ascertaining that participants had understood the information correctly they were asked what the real function of the object was. Results showed that adults appealed to the history of the object and, irrespective of how many other people now used the object for something else, based their function judgments on intended design. However children in both conditions chose the intended function and the current function equally as often.

In a further experiment, the authors assessed whether more arbitrary categorization judgments were based on information about design, or whether they were based on current function. Given that categorization judgments are not constrained by what the object looks like, or what it does, judgments of category

labels may be more easily influenced than function judgments, particularly in the conventional condition where everyone's categorisation is at odds with the intended use designated by the designer. Children aged 4 and 6-years –of-age participated in this experiment along with adults. The experiment was identical to that of Experiment 1 however the test question was changed from a function question "What is it for?" to a categorisation question, "What is it?" The results of the adults were identical to their results from the first experiment, making decisions in line with the original intention of the designer regardless of the condition. The decisions of both the 4 and 6-year-olds were affected by condition. In the idiosyncratic condition where only one person used the object in a way that was contrary to what it had originally been designed for children of both ages categorised the object according to the intention of the original designer. In the conventional condition where a large number of people used the object for a different purpose to its original design children's judgments were split, as in Experiment 1. The results suggest that adults use the history of the object regardless of whether they are required to make a category or a function judgment, and regardless of how many other people choose a function or category at odds with the original designer of the object. When making decisions about category, but not function, children appeal to the history of an object if only one agent uses the object for a function contrary to what it was designed for. However it seems that a large number of people using the object for a different purpose affects the children's categorisation decisions and interrupts their tendency to rely on the designer's original intention.

One explanation for this is cited by Gutheil, Bloom, Valderrama and Freedman (2003). They note that young children take history into account when the history is not in conflict with the current status of the object. In the previously mentioned study the history is in conflict with the current status of the object, particularly in the

conventional condition where everyone is using it in line with its current status, rather than its original intended function. It may be then, when faced with this, children are less confident to take the history of the object into account, and instead reason in line with current function. When only one person is using the object for a purpose contrary to what it was originally designed to do children take the history of the object into account and base their decision on original intent. Given this possible explanation for the results it would be presumptuous to just assume these results show that children are not able to take the history of an object into account in any of their decision making. There are certainly instances when it is more difficult for children to do this. However even young children have shown an awareness of the importance of the history of an object, including the designers intentions, and take this into account in decisions about objects.

The studies discussed so far have considered whether adults and children take historical information into account in decisions of object naming and function, and whether children can infer some aspects of history when they are provided with other historical details. Three studies have specifically examined the role of history in ownership decisions (Gelman, Manczak and Noles, 2012; Friedman, Vondervoort, Defeyter & Neary 2013; Nancekivell & Friedman, 2013). As mentioned above, previous studies have assessed whether children use the history of an object, namely the creators intent, when deciding what to name it, and what function it has. In these studies children have often made use of perceptual and functional cues in order to discover the true intent of the creator when the object was made at some point in the past. However Gelman, Manczak and Noles, (2012) claim that whilst ownership cues are often intertwined with perceptual and functional features of objects, an understanding of ownership based on history goes beyond merely observable features. For this reason, they pitted functional and perceptual cues against object

history. As previously mentioned the word “history” can relate to a number of different concepts. In this study “history” does not involve using the cues available to create a historical narrative, nor does it involve basing decisions on historical information that is explicitly provided. Children are explicitly told who each object belongs to and the “history” relates to the visuo-spatial tracking of the object in time. The object is never moved out of sight, and at no point does “history” relate to a time before the experiment began.

In the first experiment adults and children aged 2 and 3-years of age were shown between 9 and 12 sets of 3 toys. The sets of toys were either identical (toys were perceptually and functionally the same); “participant-plain” (the toy assigned to the participant was less desirable than the other two toys); and varied sets (the three items were perceptually and functionally different). The experimenter picked up each of the toys in turn and informed the participants who they belonged to. In each set one toy was introduced as belonging to the participant, “this is yours; this is for [insert child’s name]” and one as belonging to the experimenter. The participant’s attention was drawn to the final toy but it was not labelled as belonging to anyone. After the participants had heard information about each toy they were asked to indicate which one was theirs, and which was the experimenters. Participants could track the history of the objects and base their answer on this history. Alternatively they could merely choose which object they liked the best, particularly in the “participant–plain” condition, where their object was the least desirable out of the three target objects. Finally they could rely on perceptual cues leading them to choose at random, particularly in the identical condition.

Results showed that adults identified the owner correctly across all item sets, and when asked which object was theirs and which was the experimenters. The 3-year-olds also identified the owner correctly across the three item types, and for the

self and other question. The results showed that children at this age were more successful at identifying which object they owned, but were still above chance levels when identifying the object which belonged to the experimenter. The results of the 2-year-olds indicated that they had difficulty with the identical sets, in which they selected at chance, and the “participant-plain” sets where they selected a more desirable object. The results of the 2-year-olds do not suggest that children at this age are unable to appeal to history in ownership decisions, as they correctly identified the experimenter’s object in the “participant-plain” and varied sets. It may instead be a case of an inability to inhibit a desire to select a more attractive object, when the object which has been assigned to them is less desirable than other available objects. Furthermore the results of the 3-year-olds suggest that young children consider object history in ownership decisions even when the decisions are related to other owners. The results from the identical condition also show that 3-year-old’s understanding of ownership is based on history and goes beyond evident perceptual and functional information. In a similar way to the aforementioned study by Kemler Nelson, Herron & Morris, (2002) children’s use of object history in this experiment was spontaneous. At no point were children explicitly told to track the history of the object and attend to this more readily than other available information. However children tracked not only their own object but two other, in some cases, identical items through time and space being able to identify their own object and the experimenters object at the end of this.

The results of this study highlight the importance of object history in ownership decisions. Ownership is invisible and cannot be deduced by a mere consideration of the perceptual properties of an object. Whilst these properties may be useful cues to ownership when inferring the history of the object to ascertain who the owner is, it is the history which guides ownership decisions and not just these cues themselves.

A further study assessing the effect of history on ownership decisions was conducted by Friedman, Vondervoort, Defeyter & Neary (2013). In this study however the history of the object referred to the events which happened before the character's first contact with the object, rather than the spatiotemporal path of the object. In the first study children aged 3, 4, and 5-years-old were shown stories of two characters standing side by side. Each character possessed an object in turn and it was then placed in between the two characters. The children were then asked which character owned the object. In the "starts with" condition the object started with one of the characters at the beginning of the story, and was subsequently possessed by the other character before being placed in between the two of them. In the "starts-between" condition the object did not start with one character possessing it, but rather with the object in between the two characters. The results showed that when one of the characters was seen possessing the object when the story began, i.e. in the "starts-with" condition children were more likely to choose this character as the owner of the object. However in the "starts-between" condition children at all ages selected between the characters at chance, demonstrating that the first possessor of an object is only chosen as its owner when this character is seen possessing the object from the start. The authors claimed that this was evidence that first possession is not used to directly infer ownership, but rather that first possession is used in ownership decisions because it is informative about the past, i.e. the history of the object and who possessed this object in the past. What is important in this study is that children were not given any explicit information regarding the history of the object, but were required to infer it from the cues available to them. These findings suggest that when not given historical information they are able to infer it from the information available to them.

In order to test this a second study was conducted where children aged 5-years-old were either given information about who had had past contact with the object, (past-information condition) or information about which character would have future contact with the object (future-information condition). Children were shown stories about a boy and a girl at a park. In each story the boy and girl were seen side by side. A toy then appeared next to one of the characters, and the children were told this character was playing with the toy. In the past-information condition children were told that the other character had brought the toy to the park with them. In the future-information condition the children were told that the other character would take the toy away from the park. Children were then asked who owned the object. Results showed that the children's ownership responses were influenced by the historical information they had been provided with. In the past-information condition children chose the character that was described as having past contact with the object as its owner. However in the future-information condition the children chose the character that possessed the object in the story rather than the character that was going to take the object away with them. Despite the fact explicit information was given to children in this study the findings support the historical reasoning theory. Children's ownership decisions are affected by information informing them of who has had prior contact with an object, and children will choose this person as the owner, even if they are not seen possessing the object. However information about who will possess an object in the future is not taken into account in ownership decisions, with children choosing the first possessor of the object as its owner rather than the character who will have future contact with the object.

A further study by Nancekivell and Friedman (2013) assessed whether children made historical inferences in their explanations of ownership. This study was different to the previously mentioned study in that children were explicitly told who owned an

object and were asked to explain how the object came to be owned. In the first experiment 3 and 4-year-olds were assigned to either a liking condition or an ownership condition. Each condition consisted of 3 trials where children were shown a picture of a character standing next to an object (e.g. a hat, a rock, a picture). In the ownership condition children were told the character owned the object (e.g. "here is the boy's rock"). Children were then asked to explain why the character owned the object they were shown with. In the liking condition children were told the character liked the object and were asked to explain why this was so. Four categories of explanations were used by the children to explain their decisions. They included use/desire (e.g. "She wears it" or "He wants it"), proximity ("It is near him"), history ("He was playing with it") and acquisition ("He made/found/bought/gave it"). The results of the 3-year-olds showed that their explanations did not vary by condition for any of the coded categories. However the explanations of children aged 4-years-of-age demonstrated a marked difference across conditions. Children at this age explained ownership, but not liking in terms of history (possession of it in the past) and acquisition (bought/gave/found etc). The authors purported that the greater use of history and acquisition in the ownership condition demonstrates that children understand that current ownership of an object depends on past events, whereas preference does not. Inferring history allows children to explain outcomes, even when they did not witness the prior circumstances that caused them. A second experiment tested whether 4 and 5-year-olds referred to history when explaining why a character is using an object, or whether history is only inferred in instances of object ownership. Children were assigned to the ownership condition or the use condition. They viewed pictures of characters holding objects such as a rock and a drawing. Children were told that the character either owned the object, or was "using" the object (e.g. "The boy is playing with the rock"). The children were then asked to explain why the

character either owned the object, or why they were using it. Results showed that children used historical reasoning to explain ownership, but rarely to explain object use. Children referred to acquisition of the object to explain why it was owned, but referred to use and desire when explaining why the object was being used.

The findings of both experiments demonstrate that even young children explain outcomes by reasoning backward in time to discover plausible causes for the events. Children aged 4 to 5-years-of-age inferred history when explaining outcomes which depended on past events, for example when explaining why a person likes an object, but not when past events were not relevant to the outcome including explanations of why a person likes, or is using, an object. While children aged 3-years-old did not use historical inferences when explaining ownership the authors reasoned that this may be due to the fact they found the task difficult as there was very little information to base their explanations on. Children were told that a character owned an object and from this minimal information were expected to generate an explanation for this. Nancekivell and Friedman (2013) purport that if the stimuli given to the 3-year-olds provided them with more information they may find it easier to generate explanations for what they were seeing in the scenarios.

The previously mentioned studies show that children can use information about the history of an object when this history involves spatiotemporal tracking of an object (Gelman, Manczak & Noles, 2012), or when history refers to prior contact with an object (Friedman, Vondervoort, Defeyter & Neary, 2013). When asked to explain why someone owns an object, children aged 4 to 5-years-of-age also refer to history in their explanations of ownership, but not of liking or use. The results from all these studies suggest that children use this historical information to guide their ownership decisions.

4.1.3 The Current Experiments

The aim of the current experiments was to further investigate the role of history in decisions of object ownership. Previous experiments considering the use of history in object categorisation decisions have involved providing participants with the historical information, and assessing how this is used in judgments (Gelman & Ebeling, 1998; Barrett, Laurence & Margolis, 2008; Defeyter, Hearing & German, 2009). Some studies investigating the role of history in ownership judgments have also involved explicitly telling children who owns an object, and assessing whether they are able to track ownership of the objects visually as they move around in front of them (Gelman, Manczak & Noles, 2012). Friedman, Vondervoort, Defeyter & Neary, (2013) demonstrated that children are able to construct a historical narrative based on the start position of an object, and Nancekivell and Friedman (2013) showed that when children are explicitly told who owns an object they infer the history of it when explaining how it came to be owned. However no studies have assessed whether adults and children are able to infer history in more complex situations.

In order to test this, children and adults were asked about the ownership of clothing and jewellery. These objects are normatively worn in pairs, and as such are expected to be owned in pairs. Using objects such as this allows complex comparisons to be made between the wearer of an object, and the holder of a matching object. Object history can be pitted against normativity to investigate whether adults and children are able to infer history from the cues in front of them, or whether they favour other information such as the normative expectations surrounding these objects. These types of comparisons cannot be made using objects which do not normatively come in pairs.

It was hypothesised that in the condition where the object being worn and the object being held match participants would choose the wearer of the object as the owner of it. However when the object being worn and the object being held do not match both adults and children would choose the holder of the object as its owner.

4.2 Method

4.2.1 Design

This study followed a 2x2 between subjects factorial design. Factor 1 was age which had two levels; adults and children. Factor 2 was condition which comprised two levels; match (the object being worn matched the object being held) and non-match (the object being worn does not match the object being held). The dependent variable was whether the character holding the object, or the character wearing the object was chosen as the owner of it.

4.2.2 Participants

Forty adults aged 18-60 years and 40 children aged 3-4 years-of age took part in the study. Adults were recruited from Northumbria University and were predominantly white middle class. Children were recruited from primary schools in the North East of England serving mainly white middle class backgrounds. Two year olds were not included in this experiment as previous research has shown their ownership judgments can be affected by a number of different things such as the end position of an object in serial possession studies (Friedman & Neary, 2008), or a motivation to choose a more desirable object when tracking the history of objects belonging to

themselves and others (Gelman, Manczak & Noles, 2012). In contrast 3 and 4-year-olds do not construe ownership merely in terms of perceptual or functional properties of an object, but make use of information about the object's history, and spontaneously use this in their ownership decisions. Participants were randomly assigned to one of two conditions according to age. In the match condition, there were 20 adults; 3 male and 17 female (M = 24.6 years; range 18 – 48 years) and 20 children; 8 male and 12 female (M = 4.1 years; range 3.4 – 4.8 years). In the non-match condition, there were 20 adults 3 male and 17 female (M = 26 years; range 19 – 43 years) and 20 children 9 male and 11 female (M = 4.2 years, range 3.3 – 4.7 years).

Table 4.1 Number of participants (by age group) for the match and non-match conditions.

Condition	Adults	Children
Match	20	20
Non-Match	20	20

Ethical approval was granted by the Northumbria School of Life Sciences Ethics Committee. Written informed consent was obtained from the adult participants (see Appendix 2&3) before any testing took place. Prior to the commencement of any testing of child participants at primary schools the head teacher consented to the experiment taking place (see Appendix 1). Written, informed consent was also obtained from the parents of the participating children (see Appendix 2 & 3), and on the day of testing if the child seemed uncomfortable, or said they did not wish to take part, and did not give their verbal consent, they were not involved in the study. Children were given child friendly pens and pencils for taking part and the staff at the

school were given boxes of chocolates as a token of thanks. Adults were debriefed immediately after the experiment. Children were verbally debriefed and thanked for taking part, and a debrief was given to the parents when they arrived to collect their children from school (see Appendix 4).

4.2.3 Materials

Adults and children saw three scenarios. Each scenario was about two girls and everyday objects: wellington boots, earrings, and gloves (with this order used, or the reverse). Each scenario was depicted on a single page, which showed one girl wearing an object, and the other girl holding an object. Whether the holder of the object was on the left and the wearer was on the right, or the reverse, was counterbalanced across participants. The text underneath introduced the character, and informed the reader what the character was doing with the object (e.g. "This is Jessica. Jessica is holding a glove"). The characters only possessed their respective objects, and at no time were seen possessing the object of the other character. In the match condition, the object one character was wearing matched the object the other character was holding. For example the worn object was a blue glove and the held object was also a blue glove. In the non-match condition the object that one character was wearing was different than the object the other character was holding. For example the worn object was a blue glove, and the held object was a green glove (see Figure 4.1 for an example of the scenarios in the match and non-match conditions, and Appendix 5.5 for example of all scenarios).



Figure 4.1 Example stimuli used in the match and non-match conditions of the history study

4.2.4 Procedure

In each of the two conditions participants received 3 trials. Adults were tested individually in a room in the Cognition and Communication laboratory at Northumbria University. Adults were given the scenarios and the answer booklets and were left alone to view the scenarios and complete the answer booklets (see Appendix 6 for example answer booklet). Children were tested in a quiet corner of their classrooms, or in adjoining rooms. Given the young age of the children taking part the words which were printed onto the scenarios were read out to them. The children were also monitored throughout to ensure they were engaging with the story. Once the scenario had been read to the children they were asked, “Whose is the [insert object name]?” The ownership question always related to the held object, which was also circled in red. This object was also pointed out by the experimenter to ensure children knew to which object the question referred. If the child said “I don’t know,” or did not answer, they were recycled through the story and asked the ownership question again. No children failed to give an answer after this.

If children and adults attempt to reconstruct the history of an object, and use this to guide their ownership decisions, then in the match condition, where the held object and the worn object match, participants should choose the character wearing

the matching object as the owner of the object being held by the other character. In everyday life people are more likely to wear things they own, and less likely to wear things they do not, leading to the wearer of an object having a stronger claim of ownership than a holder. From this an assumption can be made that in this scenario the wearer is likely to own the object they are wearing. In the match condition the held object and the worn object are a matching pair. A reconstruction of history may lead to an assumption that the wearer owns both objects, and had possession of both of them before the scenario began. If however participants directly infer ownership from first possession (Friedman & Neary, 2008), or base their decisions on something other than history, such as a visual association between the character and the object they are holding (Blake & Harris, 2011), then the holder should be chosen as the owner of the object. In the non-match condition reconstructing the history of the held object and the worn object would most likely not lead to a connection between the objects, as they are not a matching pair. There is nothing in the scenario linking the characters to each other's objects. A reconstruction of the history would therefore lead to an assumption that the holder brought the object they have with them, having acquired it at some point in the past, and the wearer did the same with their object. Therefore in this condition it was expected that adults and children would choose the holder as the owner of the held object, rather than the wearer of the other object, as the history of it would lead to an assumption that the holder had the object before the scenario started, and had a legitimate claim of ownership over it.

4.3 Results

Participants received a score of 1 each time they selected the wearer as the owner of the object and a score of 0 each time they selected the holder of the other

object (maximum score 3). All adults and children answered all the ownership questions, and as such all their data was included in the analysis. The mean number of endorsements of the wearer as the owner of the object, by adults and children is shown in Figure 4.2.

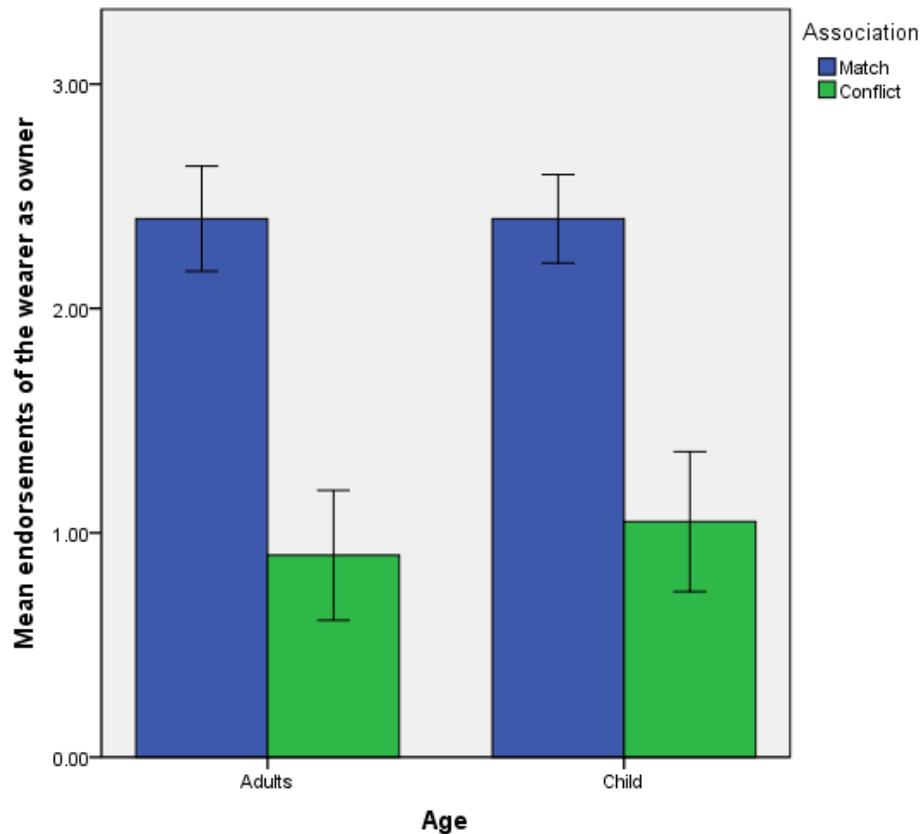


Figure 4.2 Mean endorsements of the wearer as the owner of the object by adults and children.

The data from the adults and children was then submitted to a 2 (age group: adults v 3-4-year-olds) x 2 (condition: match v non-match) analysis of variance (ANOVA).

Results showed a significant main effect of condition, $F(1, 76) = 29.579, p < .01$.

Participants were more likely to select the wearer of the object in the match condition and the holder of the object in the non-match condition ($M = 2.4; M = .98$

respectively). The main effect of age and the age x condition interaction effect were not significant $F(1, 76) = .08, p = .76; F(1, 76) = .08, p = .76$ respectively).

The results of the adults and children were then analyzed separately. An independent samples t-test demonstrated that adults chose the wearer as the owner of the object significantly more often when the worn and held objects matched, than when they did not, $t(38) = 4.03, p < .01$. In the match condition adults chose the wearer of the object as its owner at rates exceeding the chance score of 1.5, $t(19) = 3.847, p < .01$. In the non-match condition adults also chose the holder as the owner of the object at rates exceeding the chance score of 1.5, $t(19) = 2.074, p = .05$.

Children also chose the wearer of the object more often in the match condition than in the non-match condition, $t(38) = 3.66, p < .01$. In the match condition children chose the wearer of the object as its owner at rates exceeding the chance score of 1.5, $t(19) = 4.56, p < .01$). However unlike the adults, in the non-match condition children's choices were at chance level, $t(19) = -1.443, p = .165$).

4.4 Discussion

In the match condition, where the held object and the worn object matched, both adults and children chose the wearer as the owner of the held object. In the non-match condition adults chose the holder as the owner of the held object, whereas children's results were at chance.

This experiment investigated whether children and adults take historical information into account in ownership decisions, or whether their decisions are based on other factors such as first or current possession, or visual associations. It was hypothesised that when the object one character was wearing matched the object the other character was holding both adults and children would choose the wearer as the owner of the object being held, even though that character had never been seen possessing it. The basis of this hypothesis was that wearing an object often leads to a

greater claim of ownership than holding an object. The wearer can therefore be assumed to own the object they are wearing. Because the objects are a matching pair history dictates that they were bought together, and are owned by one person. If it can be assumed that the wearer owns the worn object then history dictates that they also own the held object as, at some point in the past, they were bought and owned as a matching pair. However, when the object one character was wearing did not match the object the other character was holding, it was expected that both adults and children would choose the holder as the owner of the object, as there was no evidence to suggest the wearer had past contact with the object being held, and had no legitimate claim of ownership over it.

The results from the match condition supported this hypothesis, with both adults and children choosing the wearer as the owner of the held object more often than would be expected at chance. In a similar way to many of the findings throughout this thesis this finding rules out the possibility that ownership decisions are directly inferred from first possession (Friedman & Neary, 2008; Friedman, 2008). In the match condition of this experiment the wearer of one of the objects was never seen possessing the held object, but was chosen as the owner of it over the character who was possessing it; a finding which this simple first possession account cannot explain.

The visual association account of ownership (Blake & Harris, 2011) may be able to explain the findings from this condition. Participants may have chosen the wearer as the owner of the object in this condition not because of the history but because of a visual association between the object being worn and the object being held. Wearing may create a stronger visual association than holding, and on this basis the wearer is assumed to own the worn object. Usually visual associations are made between a person and an object (Blake & Harris, 2011). However because

normativity dictates that these objects usually come in pairs there may be an additional association between two matching objects, which may have an influence on ownership decisions. If the wearer has already been attributed ownership of the worn object, and the objects in question are usually owned as pairs, then adults and children may have just matched the two objects based on a visual association and attributed ownership to the character with the strongest association with the object, i.e. the wearer. There is no evidence however to suggest that the visual associations in this account can be made between two objects, rather than a person and an object, and therefore the suggestion that this account can explain the findings is tenuous.

Alternatively this result could imply that adults and children are appealing to the history of the object. As mentioned previously in everyday life people are more likely to wear things they own, and less likely to wear things they do not. Whilst there are obvious exceptions to this rule, such as when someone has borrowed an item of clothing from someone else, this is generally understood to be the case. In the match condition, where the worn and held objects match, reconstructing the history of the object would lead to an assumption that this girl had possession of both of the objects before the scenario began. Historical assumptions could then also be made as to why the other character now has one of the objects. It could be that the girl wearing the object gave the matching object to the other girl to hold. Perhaps the wearer of the object gave permission to the other girl to try on the object, and having done so this girl is now waiting to return the object to the wearer, and rightful owner. Other reconstructions of history may lead to different stories. However based on the historical account of ownership it may be the case that participants inferred that the wearer of the object was more likely to have had past contact with both objects in the scenario. They were therefore more likely to have a legitimate claim of ownership over the object being held despite the fact they were never seen possessing it.

One final explanation for the results may be that adults and children know that items such as these are a set, and probably owned by the same person. From there they could ask which person is more likely to be the owner. Whilst they could solve this by inferring history, they could also reason that ownership implies the Right to Use, and the wearer is making more normative use of the earring. In this condition the history of the object, and the visual association between the objects, are sources of information which complement each other, and which may be working together. It is therefore difficult to ascertain exactly which theory participants are basing their decisions on; it could have been that both played a part in the ownership decisions.

In the non-match condition, the results of the adults were in line with the hypothesis, with adults choosing the holder as the owner of the held object more than would be expected at chance. The scenario in the non-match condition is an unusual one, as both characters are possessing one of an object which normatively come in matching pairs. In this condition the items don't match, and there is no indication of where the matching items are. Adults could have reasoned that wearing gives a greater claim of ownership than holding and that normatively objects such as these come in pairs. Therefore, despite the difference in the colour of the gloves they could have attributed ownership to the wearer. However adults did not make decisions on this basis, suggesting they were reasoning in a different way.

Adults may have used the simple first possession account of ownership, (Friedman & Neary, 2008; Friedman, 2008) when making their decisions, inferring that the character possessing the object was its owner. Whilst this theory can account for the results in this condition its inability to explain the results from the match condition suggests adults were not consistently basing their decisions this account.

Alternatively adults may have based their decisions on the visual association account of ownership, forming an association between the character and the object

they are holding. This theory would explain the results observed in this condition as the holder, and not the wearer, was chosen as the owner of the object. However if the visual association account of ownership explains these findings, through an association between a character and an object, it cannot account for the findings in the previously mentioned match condition, where the character most closely associated with the object was not chosen as its owner.

Another possible theory to explain these results is that adults reconstructed the history of the object to ascertain who had prior contact with it (Friedman, Neary, Defeyter & Malcolm, 2011). Current possession of the object in this case may indicate prior possession. If this is true it can be assumed that the holder possessed the object before the scenario began, having legitimately acquired ownership of it. There is no visual association between the objects as they are not a matching pair, and therefore no information to suggest that the wearer had any prior contact with the held object, or will have possession of it in the future, all of which suggest the wearer does not own the held object.

The results of the children however did not support the hypothesis, with children making ownership decisions at chance rates. Both the simple first possession account of ownership (Friedman & Neary, 2008; Friedman, 2008), and the visual association account (Blake & Harris, 2011) struggle to explain these findings. If either of these accounts had formed the basis of children's ownership decisions the holder of the object should have been reliably chosen as its owner. The historical account of ownership (Friedman, Neary, Defeyter & Malcolm, 2011) can account for these findings more clearly than the other two theories. In the match condition the history of the objects, and the visual association between the two objects, point to the wearer as the owner of the held object. In the non-match condition however these sources of information are in conflict with each other. For

example in the earring story if children see one character wearing an earring their knowledge of normativity informs them that these objects come in pairs, and therefore the wearer should have two earrings. By reconstructing history it can be deduced that at some point in the past these earrings were bought, and owned, as a pair. The next logical step is to look for the earring which matches the one being worn. However the other earring in this scenario is not visually similar to the one being worn, and history would suggest this earring was not part of the matching pair the wearer bought at some point in the past. There is no information to suggest the wearer has ever had contact with the held earring. The child is then faced with conflicting information. History and normativity suggest the earring being worn is part of a pair, and at some point in the past the wearer owned both earrings. The lack of visual association between the two earrings however dictates that the held earring does not belong to the wearer, and was at some point in the past bought by the holder. When faced with these competing sources of information it appears children do not know which character to choose as the owner of the objects and therefore guess, leading to chance results.

One explanation of the results may be that children at this age do reconstruct the history of objects and use this to guide their ownership decisions, but this is weakened when other sources of information provide competing accounts of ownership. Whilst the other information does not seem to have as great an effect on adults' decisions it may be that, if children are given more explicit information to help them retrace the history of an object, their ownership decisions may be less affected by other sources of information such as visual associations.

In order to further assess the role of historical reasoning in ownership decisions a second experiment was conducted, which pitted visual associations and normativity against historical reasoning. However in these experiments more explicit

ownership information was provided, which enabled the history of the objects to be more clearly inferred. The information given to participants in the scenarios did not explicitly state who owned the object. As such it was assumed that if this information was used to guide decisions of ownership this would be because adults and children were using the information to reconstruct the history of the object in order to establish who had prior contact with it, in a way which granted them legitimate ownership of it.

4.5 Method

4.5.1 Design

This experiment followed a 2 x 2 x 2 mixed factorial design. The between subjects factors were: 1) Age, which had two levels: adults and children, and 2) Condition which had two levels: match and non-match. The within subjects factor was information which inferred ownership (this information was given through the speech of one of the characters). This factor had two levels; looking for the object, or trying on the object. The dependent variable was whether the character holding the object or the character wearing the object was chosen as the owner of it.

4.5.2 Participants

Forty adults aged 18-60 years, and 30 children between the ages of 3 and 4 years participated in this experiment. Adults were recruited from Northumbria University and were predominantly white middle-class. Children were recruited from primary schools in the North East of England serving mainly white middle class backgrounds. This age group was chosen because 3 and 4-year-olds do not construe

ownership merely in terms of perceptual or functional properties of an object but make use of information about the objects history and spontaneously use this in their ownership decisions. In addition to this children at this age had participated in Experiment 5 and including children of other ages in this experiment would make comparisons between the two studies more difficult. Participants were randomly assigned to one of two conditions according to age. In the match condition there were 20 adults; 3 male and 17 female (M = 22 years; range 20 – 32 years) and 15 children; 7 male and 8 female (M = 4.1 years, range 3.2 – 4.8 years). In the non-match condition there were 20 adults; 6 male and 14 female (M = 26, range 19 - 48) and 15 children; 7 male and 8 female (M = 3.6 years, range 3.1 – 4.8 years).

Table 4.2 Number of participants (by age group) in the match and non-match conditions.

Condition	Adults	Children
Match	20	15
Non-Match	20	15

Ethical approval was granted by the Northumbria School of Life Sciences Ethics Committee. Written informed consent was obtained from the adult participants (see Appendix 2&3) before any testing took place. Prior to the commencement of any testing of child participants at primary schools the head teacher consented to the experiment taking place (see Appendix 1). Written, informed consent was also obtained from the parents of the participating children (see Appendix 2 & 3), and on the day of testing if the child seemed uncomfortable, or said they did not wish to take part, and did not give their verbal consent, they were not involved in the study. Children were given child friendly pens and pencils for taking part and the staff at the

school were given boxes of chocolates as a token of thanks. Adults were debriefed immediately after the experiment. Children were verbally debriefed and thanked for taking part, and a debrief was given to the parents when they arrived to collect their children from school (see Appendix 4).

4.5.3 Materials

Adults and children saw six ownership scenarios similar to the ones in Experiment 5. Each scenario was about two girls and everyday objects including wellington boots, earrings and gloves (with this order used, or the reverse). Each scenario consisted of a single page, and depicted one girl wearing an object and the other girl holding an object. The text underneath introduced the character and informed the reader what the character was doing with the object (e.g. “This is Charlotte. Charlotte is wearing an earring). The characters only possessed their respective objects, and at no time were seen possessing the object of the other character. In the match condition the object one character was wearing matched the object the other character was holding. For example one character was wearing a blue earring, and the other character was holding the matching blue earring. In the non-match condition the object that one character was wearing was different to the object the other character was holding. For example one character was wearing a blue earring, and the other character was holding a green earring (see figure 4.3 for an example of the scenarios in the match and non-match condition). Unlike in Experiment 5, the scenarios in this experiment were also accompanied by speech from one character to the other. The character expressed thanks to the other character for allowing them to try on an object (“Thanks for letting me try this on”), or informed the other character that they had been looking for the object that character

was holding (“Thanks I’ve been looking for that”). The character wearing the object was always the character who was speaking. In both the match and non-match conditions half of the participants saw three stories where the character was looking for the three everyday objects followed by three stories where the character was trying on the objects, and half of the participants saw the reverse. Whether the holder of the object was on the left and the wearer was on the right, or the reverse, was counterbalanced across participants (see Appendix 5.6 for examples of all scenarios).

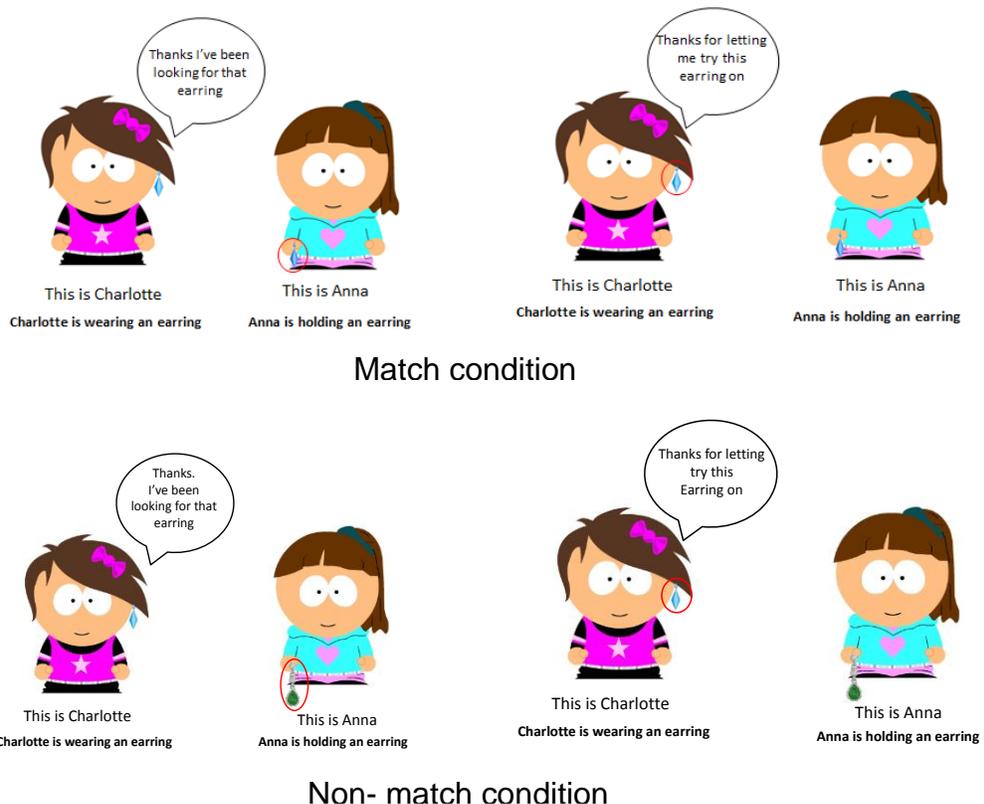


Figure 4.3 Example stimuli used in the match and non-match conditions of the history study.

4.5.4 Procedure

In each of the two conditions (match and non-match) adults and children received six trials. Adults were tested individually in a quiet room in the Cognition and Communication laboratory in Northumbria University. Adults were given the story

booklets and answer sheets, and were left alone to read the stories and complete the answer booklets. Children were tested in a quiet corner of their classrooms or in adjoining rooms. The words were printed on the stories but were read out to the children due to their age. The children were also monitored to ensure they were engaging with the story. In both conditions each scenario was shown to the child and the accompanying text, including the speech from the character, was read out. Following this the child's attention was drawn to the object circled in red and they were asked "Whose is the (insert object name)?" If the child said "I don't know," or did not answer, they were recycled through the story and asked the ownership question again. If after the second time of asking the child still failed to give an answer they were moved onto the next story. No child failed after the second time of hearing the story.

It was hypothesised that when given more explicit information, allowing the history of the object to be more easily constructed, both adults and children would use this information as the basis of their ownership decisions. Regardless of whether the objects in question matched or did not match, it was expected that participants would privilege the ownership information above the visual cues, and this would guide their ownership decisions. If participants based ownership judgments on visual associations between the characters and the objects, or cues by which they simply match the target item to the item the character is wearing, there should be a significant difference between results in the match condition and non-match condition.

4.6 Results

In each condition, for each answer in line with the information that inferred ownership participants were given a score of 1 for the owner and 0 for the non-owner (for example with the "looking for" information the wearer would score 1 and the holder would score 0, as the information indicated that the wearer was the owner. With the "trying on" information the holder would score 1 and the wearer would score

0). Adults' and children's endorsements in line with the ownership information are shown in Figure 4.4 and 4.5.

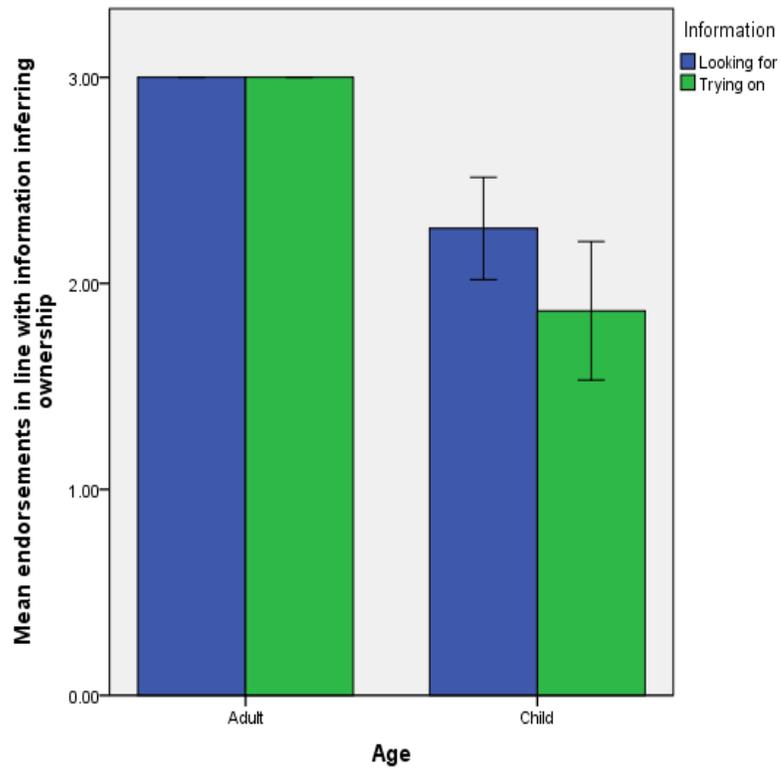


Figure 4.4 Mean endorsements of adults and children, in line with information inferring ownership in the match condition.

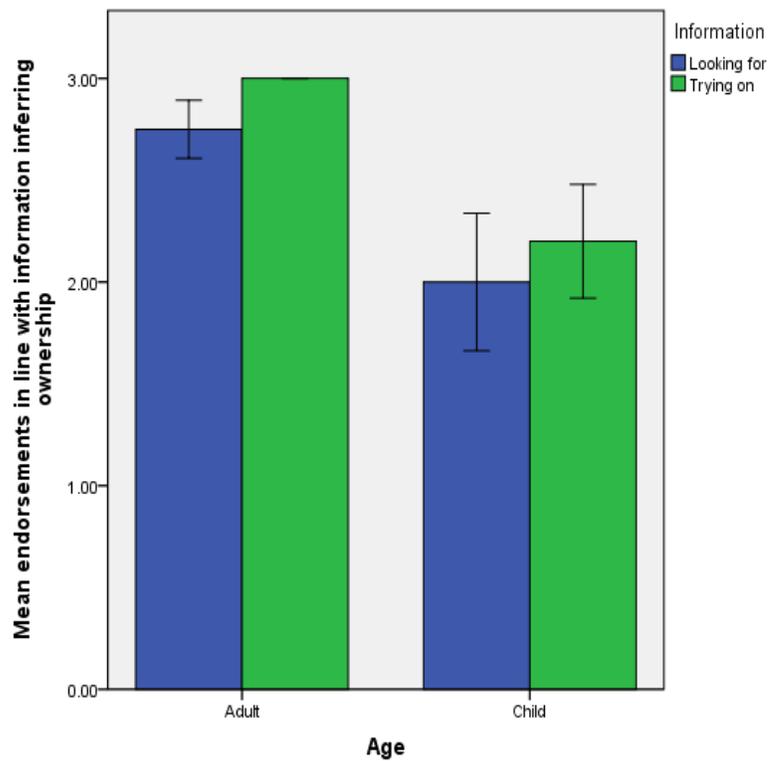


Figure 4.5 Mean endorsements of adults and children, in line with ownership information in the conflict condition

The data from adults and children were then submitted to a 2 (age group: adults v 3-4 year-olds) x 2 (condition: match v non-match) x2 (ownership information: looking for and trying on) mixed factorial analysis of variance (ANOVA). Results demonstrated no significant main effect of information, and no significant main effect of condition $F(1, 66) = .01, p = .92$; $F(1, 66) = .09, p = .76$ respectively. There was an overall significant main effect of age $F(1, 66) 32.41, p <.01$, with adults basing more of their decisions on the information which inferred ownership than children, regardless of the condition or the information given by the characters. There were no significant information x age, information x condition or age x condition interaction effects $F(1, 66) = .85, p = .36$; $F(1, 66) = 3.02, p = .09$; $F(1, 66) = .28, p = .6$ respectively.

The results from the adults and children were then analysed separately. An independent samples t-test revealed no difference in adults' endorsements in line with ownership information between the match and non-match conditions, $t(38) = 1.75, p = .08$. Regardless of whether or not the held object matched the worn object, adults made their ownership decisions in line with history. The adults in the match condition based all their decisions on the information inferring ownership. In the non-match condition adults based all their decisions on the information which inferred ownership when the character was trying on the object, and when the character was looking for the object decisions were made in line with information inferring ownership more often than would be expected at chance, $t(19) = 8.753, p <.01$.

An independent samples t-test also showed no difference in the children's endorsements in line with information inferring ownership, between the match and non-match conditions $t(28) = -.100, p = .92$. Children in the match condition based their decisions on information which inferred ownership more than would be expected at chance when the character was looking for the object, but not when the character was trying on the object $t(14) = 3.089, p <.01$; $t(14) = 1.091, p = .29$ respectively. In

the non-match condition children made ownership decisions in line with information inferring ownership more than would be expected at chance when the character was trying on the object but not when the character was looking for the object $t(14) = 2.505, p = .03$; $t(14) = 1.479, p = .16$ respectively.

4.7 Discussion

Results showed that adults made decisions in line with information inferring ownership in both the match and non-match conditions, and when the information was about the character looking for the object and trying the object on. In the match condition children reasoned in line with information inferring ownership when the character had been looking for the object, but not when they were trying it on. The reverse was true in the non-match condition.

This experiment investigated whether giving children and adults more explicit information to help reconstruct the history of an object would make them more likely to base their decisions on the information which inferred ownership, or whether factors such as first or current possession, or visual associations, would have an effect on ownership decisions. It was hypothesised that giving children and adults more explicit information would make reconstruction of the history of the objects easier, and would lead to more decisions of ownership being based on the information inferring ownership. The results from the adults strongly support the experimental hypothesis, with adults making decisions in line with history in the match and non-match condition, and regardless of which piece of historical information they saw. The results of the children partially support the hypothesis with some decisions being made in line with history in both the match and non-match conditions.

The results of the adults in the scenario where the objects match, and where the wearer has been looking for the held object, rule out the possibility that ownership is directly inferred from first seen, or current possession (Friedman & Neary, 2008). If adults were basing their decisions on a simple first possession account then the holder, and not the wearer, should be chosen as the owner of the held object; something that did not happen in this condition. This scenario however does not rule out the possibility that ownership decisions were based on visual association. As in Experiment 5, normativity dictates that a person does not wear one earring, as earrings are usually worn in pairs. Adults may have deemed the wearer to be the owner of the worn object, due to a strong visual association between the worn object and the wearer, and then merely looked for the matching object which completed the pair. There is a visual association between the holder and the held object, however the strength of association that wearing creates, and the fact the objects are a matching pair, may be stronger than this visual association.

The results of the adults in the match condition strongly suggest that their ownership decisions were based on historical reasoning. For example with the earring in the match condition, where the wearer has been looking for the held earring, a reconstruction of history would lead to an assumption that the wearer had possession of the held earring at some point in the past, and had misplaced it. They are thanking the holder who has found, and is now returning, their lost earring. Unless the wearer owned the earring that had been found it would be unusual to be thanking the other character for finding it. However, the historical information given by one of the characters supports the visual association between both the wearer and the earring, and the two earrings, and reasoning in line with either of these theories, or perhaps using both, would lead to the wearer being chosen as the owner of the earring being held. In this situation when the objects match each other, and the character has been

looking for the object, it is not clear whether historical reasoning or visual association is most likely to be the theory underpinning these ownership decisions. In the match condition, where the wearer of the earring is trying it on, there is a clearer distinction between history and visual association. In this scenario, the character is wearing the earring in question, thereby creating a strong visual association with the object. The other character is holding an earring which matches the one being worn, creating a strong visual association between the two objects. The holder of the earring is at no point seen possessing the worn earring. Therefore, in terms of visual association, the holder does not have a stronger connection to the worn earring than the character wearing it. If ownership decisions are based on an association between a person and an object, then the wearer of the earring should be chosen as its owner. If however ownership decisions are based on historical reasoning then the holder should be chosen as the owner of the earring, based on the information given by the character. The wearer of the earring is thanking the holder for allowing them to try the earring on. Reconstructing the history based on this information may lead to an assumption that the holder of the earring possessed the worn earring at some point in the past. This character then allowed the other character to try the earring on, but not to keep it. Whilst the wearer is seen possessing the earring in the scenario, history dictates that they are not the owner of this object and must, at some point, return it to the holder who has a legitimate claim of ownership over it. The results from the adults in this scenario demonstrate that decisions were made in line with historical reasoning in every instance.

In the previous scenario, where the wearer is looking for the held object, all adults chose the wearer as the owner of the held earring, even though this character was never seen possessing it. In this condition the wearer is not chosen as the owner of the earring, even though they are wearing it, and therefore have the strongest

visual association with it. The association between the earrings in the “trying on” scenario is identical to the “looking for” scenario, and therefore the only explanation for choosing the wearer in the “looking for” scenario, and the holder in the “trying on” scenario, is that ownership decisions are based on the information given by one of the characters. Adults chose to ignore the visual association between the wearer and the worn object, the fact the wearer has possession of the worn object throughout the scenario, and the association between the two matching objects, and base their decisions on the information given about the object, deeming the holder to be the rightful owner.

It must be acknowledged that decisions of ownership in some cases could have been based on control of permission (Neary, Friedman & Burnstein, 2009). When one character is thanking the other for allowing them to try on the object they are wearing, participants may have chosen this person as the owner, not based on historical reasoning, but because they are deciding who can possess the object. However this control of permission is not explicitly highlighted in the story, and as such would have to be inferred from the information given. This inference would most likely come from reconstructing the history of the object, based on the perceptual information available. In order to allow someone to try on the object, the character controlling permission must have ownership of it. It can therefore be inferred that at some point in the past they obtained this ownership in a legitimate manner, which now affords them with the right to control who possesses the object and who is excluded from it. Control of permission is inferred through the historical narrative, which again lends support to this as a theoretical framework underpinning ownership decisions.

In the non-match condition, where the wearer is looking for the held object, there is no visual association between the two objects, and as such adults can only

rely on two things; the visual association between the character and the object they are associated with, or the history of the object. In the first experiment in this chapter, when there was no explicit information given, and no visual association between the wearer and the earring being held, adults chose the holder of the held earring as its owner. The only difference between this experiment and Experiment 5 is the information given by the character holding the earring, which links the wearer to the held earring. The reason most adults choose the wearer as the owner of the held object can only be because they are using the information to reconstruct the history of the object, as visual associations lead to the holder being chosen as the owner. Reconstructing the history leads to the conclusion that if the wearer of one earring is looking for the other one it must be because they had possession of it at some point in the past, and have misplaced it. The fact they have been looking for it demonstrates that they want it back from the holder, as they have a legitimate claim of ownership over it, and the holder does not.

In the scenario where the wearer of the earring is thanking the other character for allowing them to try it on the strongest visual association in this case is between the wearer and the earring they are wearing. If ownership decisions were based on this then the wearer should be chosen as the owner of this earring. However adults choose the holder of the other earring as its owner in every instance, despite the fact there is no visual association between this character and the earring in question. This again suggests that adults use the information given in the story to reconstruct the history of the object to ascertain who was most likely to have had prior contact with the object, and who has a legitimate claim of ownership over it. In this scenario visual association links the wearer with the worn object. The information inferring ownership is the only thing that links the holder with the earring being worn by the other character.

The results from the children are less clear in all respects. In the match condition when the wearer of one earring had been looking for the held earring, children reasoned in a similar way to adults, choosing the wearer as the owner of the earring in this scenario. Again this result rules out the simple first possession account of ownership (Friedman & Neary, 2008; Friedman 2008). However, as was the case with adults, in this condition it is difficult to ascertain what children's decisions were based on, as it is hard to differentiate between history and visual association. Both of these sources of information complement each other, and would lead to the wearer being chosen as the owner of the object. In the match condition, where the character is trying on the object, children's decisions were at chance levels. This may have been because the strongest visual association was between the wearer and the earring they were wearing. The historical information in this case however pointed to the holder being the owner of the object, and as such, was in competition with this visual association. Children may have experienced conflict between the two sources of information as they were directing them in different ways. The visual association may have weakened the history of the object given by the information from the character, or vice versa. The result of this conflict was children not consistently making decisions in line with either history or visual association. What should be noted here however is that Blake and Harris (2011) purport that, particularly for children under 5-years-of-age, the initial encoding of ownership is more inclined towards visual information than verbal information, and once this visual ownership has been encoded children will resist changing it. Their example is that if a child observes a person with an object, but is verbally told the object belongs to someone else the verbal information may be ignored due to the strength of the visual image. In the scenario in this study children saw a character wearing an earring, creating a strong visual association between the character and that earring. This information in

the scenarios was presented verbally to the children by the experimenter, and did not explicitly inform them that the holder of the earring owned the worn earring. Instead children were required to infer this, by reconstructing the history of the object, based on the information available to them. Expecting children to process all this information and consistently base their judgments on the history of the object is a considerable challenge. The fact that the children did not base their decisions on visual associations in every circumstance potentially demonstrates the impact of the historical information.

Unlike in the match condition children in the non-match condition chose at chance levels when the character wearing the object was looking for the held object and was thanking the other character for finding it. In this scenario the two earrings did not match, and therefore there was no visual association between them. Any visual association had to be based on the associations between each character and the objects they were either wearing or holding. If ownership decisions were based on association, then in this scenario children should have chosen the holder as the owner of the earring they are holding. The wearer is never seen in possession of it, and has no visual association with it. The information inferring ownership however signals that the character wearing an earring is in fact the owner of the held earring, despite the fact they don't match. A reconstruction of history, based on the information in the scenario, would suggest that the character wearing the earring had been looking for the one the holder had found, having had ownership of it at some point in the past, and most likely misplacing it. The fact that children are not consistently choosing the holder of the object as its owner, when visual association is pitted against history, shows that visual association cannot fully explain ownership decisions, and also demonstrates that children must be taking historical information into account. Whilst children do not base their ownership decisions on history in the

majority of cases this may be due to the salience of the visual association, which may weaken the history. If the historical information was as salient and easily accessible as the visual association children may have consistently made their decisions in line with historical reasoning.

In the scenario where the wearer of the earring was thanking the holder of the other earring for allowing them to try it on children chose the holder as the owner, rather than the wearer of the earring in question. This again demonstrates the strength of history in ownership decisions. If ownership decisions were based on visual associations then all the children should have chosen the wearer as the owner of the earring, as wearing an object creates a strong visual association. However the information inferring ownership pointed to the holder as the owner of the object, and more children chose this character as the owner. The reason for the difference between this scenario, and the scenario where the character had been looking for the object may be that children are more familiar with the concept of trying something on, and having to give it back to someone else afterwards. If children could identify with the concept more clearly this may have made the history of the earring more salient, and easier to reconstruct. Regardless of whether or not this was the case the results show that children in this instance chose to disregard the salient visual association available to them and base their decisions on the history of the object.

4.8 General Discussion

The results from both the adults and children rule out the possibility that ownership judgments are simply based on current or first seen possession. In the scenarios where current and first seen possession were in line with historical reasoning and visual associations both children and adults chose the current

possessor of the object. However in the scenarios where historical reasoning led to a decision against first and current possession neither the adults nor the children based their decisions on first seen or current possession.

The results of the adults from both studies suggest that reconstructing the history of an object provides a plausible method to ascertain who had past contact with the object. The results also show that adults' decisions can be manipulated based solely on the information given to them. When visual associations between objects and characters, and between objects themselves, were in conflict with the information inferring ownership adults chose in line with this information demonstrating that this, and not mere association, is the most likely theoretical framework upon which their ownership decisions are based. Adults are able to reconstruct the history of an object irrespective of whether the objects in a scenario match, and whether or not there is a strong visual association between a character and the object in question. It is difficult to see what could be driving the decisions of adults other than historical reasoning. As previously acknowledged adults could be basing decisions on control of permission (Neary, Friedman & Burnstein, 2009), attributing ownership to the character who is controlling permission in the stories. Even if this is the case at no point is this control of permission explicitly highlighted, and therefore it is most likely inferred from a reconstruction of the historical narrative.

The decisions of the children demonstrate that they do take historical information into account in ownership judgments. This finding would support the previously mentioned studies which claimed that children at this age are able to reconstruct history to infer a designer's intention, and use this to make decisions about what an object is and what its function is, even when the object has been damaged, or does not look exactly like what it is supposed to represent, (Diesendruck, Markson & Bloom, 2003; Jaswal, 2006). The current studies however

also show that when making ownership decisions children can be influenced by other factors, such as visual association, and their understanding of normativity, which can weaken the historical narrative. The results from the children may suggest that reasoning about ownership develops from childhood through to adulthood, and children's reasoning at this age isn't fully mature.

However there may be other reasons as to why children did not consistently reason in line with history in all their ownership decisions. In these studies there was a visual association between the characters and the objects they were holding, and in the match condition there was also an association between the two objects. Because these associations were visual they were visible to children throughout the scenarios. The historical information in the scenarios was read out to children once in each instance. Children therefore had to remember this information in order to construct a historical narrative to explain what was happening in the scenario. In addition to this children also had to reason about their expectations based on the fact the objects they were seeing usually came in pairs. In the non-match condition in particular, children may have been confused by the two non-matching objects, as they would most likely expect to see these objects with the matching other. It may have been that the memory demands placed on the children were too great and children were unable to keep track of all the information available. In the studies in previous chapters the ownership stories were simpler and involved less information to remember and process. In the current studies whilst children had the pictures in the scenario constantly available to them as a visual referent, they only heard the historical information once and had to remember this in order to make their ownership decisions. In some of the scenarios some of the children may have forgotten the verbal information while they were processing the other information. As such when it came to the question of ownership they based their decision on the visual information

in front of them. This cannot account for all the results as in both the match and non-match condition children did reason in line with history. However it may explain why some children did not consistently privilege the historical information above the other information in the scenarios. If historical information could be presented in a visual way this may help children when they are attempting to reconstruct the history of the scenario.

One of the shortcomings of the study is that in order for children to understand the relatively complicated scenario, and one in which information was presented verbally, children had to be thoroughly engaged throughout the task. However because no control questions were asked during the experiment it is not certain whether the children had identified which character was speaking, and what they were saying to the other character. If some children were not tracking the information that was being given then it would have been impossible for them to consistently base their decisions on historical reasoning in the studies. In order to ensure that children are both engaging with the story, and are able to remember the information being given to them, children should have been asked control questions such as “Who is wearing the [insert object name]” and “Who is trying on the [insert object name].” Another issue which must be acknowledged is the large difference between the mean ages in the match and non-match conditions of Experiment 6 ($M = 4.1$, $M = 3.6$ respectively) due to experimenter error. Children aged 4-years-old may have coped more successfully with the memory demands of the task, and therefore may have referred to history more readily than the 3-year-olds. This is not to say that 3-year-olds should be excluded from the study, but rather in future studies the difference between mean ages across the conditions should be smaller to ensure results are not affected because of an unequal distribution of ages. It is unclear as to why children consistently based their results on history in some of the scenarios but not others.

What is clear however is that children use historical reasoning in their ownership decisions but in some cases this historical reasoning may have been weakened.

4.9 Concluding remarks

In conclusion the results from both the children and the adults suggest that historical reasoning is an integral part of ownership decisions. The results from the adults strongly challenge the association account of ownership (Blake & Harris, 2011) as some of the results simply cannot be explained by this theory. Even when the objects in question did not match, and had no visual association between them, adults continued to make ownership judgments based on the information inferring ownership. When association is in direct conflict with history adults consistently privilege historical information in their ownership decisions. The theory of control of permission may have an influence in adults' decisions. However this reasoning would not take the place of history but rather would be inferred through the construction of the historical narrative.

The results of the children are less conclusive but also demonstrate the importance of history in ownership decisions. It is undoubtedly easier to create visual associations between characters and objects, and between objects themselves, than to reconstruct the history of an object, based on verbal information. However children did not use association as the basis of their ownership decisions. The information inferring ownership may have been difficult for the children to access, due to the medium through which it was presented, which may have been the reason for the lack of consistency in ownership decisions. Whilst these results cannot conclusively show that children were not making ownership judgments based on visual associations it is difficult to explain why, if visual associations were at the root of

ownership decisions, children's results were at chance when there were clear visual associations between the objects and the characters, and between the two objects. Children must have been taking information inferring ownership into account in these instances, which challenged the associations visible in the scenarios. Whilst not conclusive, these results do support the findings of previous studies such as Gelman, Manczak and Noles (2012), and Friedman, Vondervoort, Defeyter and Neary (2013), who found that children can track the history of an object and also take historical information but not information about the future into account when making decisions about who owns an object. These studies have made it clear that history is involved in ownership decisions. For adults it is the basis of their ownership decisions, and for children it is an important part, but perhaps more easily influenced by other salient cues such as visual associations. If historical information was presented to children visually, reducing memory demands and appearing as salient as the visual associations, children may find it easier to infer the history of the object which may have a significant influence on ownership decisions.

Chapter 5: General Discussion

5.1 Summary of objectives

The main aim of this thesis was to investigate how children and adults infer object ownership, and establish an account explaining how these decisions are made. A review of the literature on reasoning about object ownership demonstrated a paucity of research into exactly how adults and children decide who an object belongs to. Initial research suggested that both children and adults directly infer ownership from first possession (Friedman & Neary 2008), and this first possessor bias is weighted more strongly than sex stereotypes by adults (Friedman, 2008). Research into gender stereotypes has demonstrated that, even from a young age, children are aware of gender stereotypes. This awareness affects their performance in games, (Montemayor, 1974), how they explore and interact with toys, (Bradbard & Endsley, 1983) and their predictions of whether other children will like or dislike the toy. Research showed that adults' predictions of whether a person will like or dislike a toy are also based on gender stereotypes (Martin, Eisenbud & Rose, 1995). Research has also shown children identify with members in their group and prefer objects endorsed by someone of the same gender, and also the same age as them (Shutts, Banaji & Spelke, 2010). With this in mind the experiments in Chapter 2 investigated whether children and adults took gender and age stereotypes into account in their ownership decisions, when the objects in the studies were strongly stereotyped. The study used a similar methodology to Friedman and Neary (2008) and Friedman (2008), employing serial possession studies where one character is seen possessing an object, followed by a second character.

As previously mentioned, early research into object ownership revealed that, when making decisions about who owns an object, both children and adults choose the person they see first possessing the object, (Stake, 2004; Friedman & Neary, 2008; Friedman, 2008; Blake & Harris, 2009), or with whom they create an initial visual association (Blake & Harris, 2011). Chapter 3 aimed to investigate whether ownership was directly inferred from first possession or visual associations, or whether, as in property law, ownership could be attributed to the constructive possessor; a person with the intent to own and ability to exercise control over an object, but not the person first seen possessing the object. Again serial possession studies were used in this chapter.

Finally Chapter 4 aimed to further investigate whether children and adults take the history of an object into account in ownership decisions, rather than just directly inferring ownership from first possession (Friedman & Neary, 2008) or first association (Blake & Harris, 2011). Research into how children and adults decide what to name an object demonstrates they can take history into account in their decisions (e.g. Bloom & Markson, 1998; Gelman & Ebeling, 1998; Priessler & Bloom, 2008). Findings from children's and adults' decisions about the functions of objects also reveal that again the history of the object, namely the intention of the designer is taken into account when deciding what function an object is supposed to perform (Jaswal, 2006; Kemler Nelson, Herron & Morris, 2002; Asher & Kemler Nelson, 2008; Barrett, 2008). Other findings however suggest that, whilst adults take history into account in their decisions about artefact function, children aged 3 and 4-years-of-age do not always base their decisions on this (Matan & Carey, 2001; Defeyter, Hearing & German, 2009). However research into the role of history in decisions of object ownership has demonstrated that when 3 and 4-year-olds are explicitly told who owns an object they spontaneously track the history of it through time and space, and use

this in their ownership decisions (Gelman, Manczak & Noles, 2012). Friedman, Van de Vondervoort, Defeyter & Neary (2013) also found that children consider information about the history, but not the future, of an object in their ownership decisions, and Nancekivell and Friedman, (2013) showed that 4 and 5-year-olds infer history in their explanations of why characters own objects. Chapter 4 therefore investigated the role of history in ownership decisions, and whether giving children and adults' explicit information, which made reconstructing the history of an object easier, would mean they would appeal to the history of an object, and base their ownership decisions on this.

5.2. General summary of the findings

This thesis has made an original contribution to the growing number of empirical studies in this field in a number of different ways. It has

- Ruled out the first possessor account of ownership in decisions where other information is available.
- Demonstrated that both gender and age are taken into account in ownership decisions
- Highlighted the role of constructive possession in decisions of ownership and demonstrated that even lay people, ignorant of the doctrine of constructive possession, will use it when deciding who owns an object
- Provided evidence that when faced with ownership decisions both adults and children will attempt to reconstruct the history of an object to ascertain who had possession in the past in a way which legitimately granted them ownership of it.

The results from the series of experiments in this thesis demonstrate that, when children and adults are given no information other than which character is seen possessing an object first, they will base their ownership decisions on this. However both children and adults take stereotypes such as age and gender into account, and use this information when deciding who owns a particular object (Chapter 2). Results also showed that, when salient information is available upon which to establish

constructive possession, children and adults base their ownership decisions on constructive possession, rather than first possession or first visual association, even though they are largely unaware of this legal doctrine (Chapter 3). Finally the results showed that the history of the object is taken into account when making ownership decisions. Adults took history into account in all the scenarios in Chapter 4. Children did take history into account. However they did not do so as consistently as adults, with some of their decisions not exceeding chance levels. The results will be discussed in further detail below.

5.3. Effects of stereotypes on ownership decisions

The current thesis found that gender and age stereotypes significantly affect both children's and adults' ownership decisions. Children and adults based their ownership decisions on gender and age stereotypes, rather than directly inferring ownership through first possession. In the gender stereotype study adults and children made ownership decisions in line with gender stereotypes. However they were more likely to do this when the first possessor matched the gender stereotype than when it was in conflict with it. This was most likely due to the strength of the stereotype of the masculine items used in this study. The masculine items were chosen based on ratings of toys from both parents and non –parents (Campenni, 1999), and were rated as being only appropriate for boys. However none of the masculine items in Campenni's study were as highly stereotyped for boys as the feminine ones were for girls. Therefore, at times, when masculine gender stereotypes were pitted against first possession in the conflict condition, ownership decisions were based on first possession rather than gender stereotypes. Despite this finding, overall both children and adults based their ownership decisions on gender

stereotypes and not on first possession (Friedman & Neary, 2008), or first visual association (Blake & Harris, 2011). In the age stereotype study both adults and children chose in line with the stereotype in both the match and conflict conditions, regardless of whether this character was the first possessor of the object or not.

The results from the studies in Chapter 2 are somewhat in line with the research into the effects of gender and age stereotypes on children's and adults' behaviour. As previously mentioned Montemayor, (1974) found that children's performance in a game was affected by their knowledge of who the game was for. Montemayor found that when children were told the game they were playing was for their sex they performed better than when they were told it was for the opposite sex. Children are also less willing to explore objects that have been labelled as for the other sex, and spend longer exploring objects which they know are meant for their sex (Bradbard & Endsley, 1983). Children identify with members of their group, preferring toys endorsed by children of the same sex, and also preferring objects endorsed by children rather than adults (Shutts, Banaji & Spelke, 2010). In a similar vein both children and adults predict that, if they like a toy, other members of their gender group will like it, but members of the other gender group will like it less, and vice versa. Whilst these studies are not directly about ownership they demonstrate that children are aware of sex stereotypes and identify with their particular group.

These results are in contrast to the findings of Friedman and Neary (2008), who claimed ownership was directly inferred from first possession, and Friedman (2008) who demonstrated that adults rely on first possession over sex stereotypes when making ownership judgments. Friedman presented adults with two serial possession studies, in which two characters possessed different sex stereotyped objects such as a ball (a masculine item) and a teddy bear (a feminine item). Some of the participants saw tasks where the first possessor was consistent with the sex

stereotype (i.e. the first possessor was a boy holding a ball), whereas others saw scenarios where first possession was pitted against sex stereotype (i.e. the girl as first possessor of the ball). Results showed that despite the fact participants appealed to sex stereotypes when deciding who liked the object more, they appealed to first possession when making judgments about who owned the objects.

The most likely explanation for the differences in the results between the experiments in Chapter 2 and the results of Friedman, (2008) is the strength of the gender stereotype of the objects. As mentioned earlier in a study by Campenni (1999) parents and non-parents were asked to rate a variety of different toys in relation to how appropriate they were for boys and girls. According to these ratings the objects used in Friedman's study (2008) were equally appropriate for boys and girls. With this in mind one may argue that Friedman's study was not a test of whether gender stereotypes are used in ownership decisions, but rather a serial possession study involving neutral objects. In these scenarios ownership is usually directly inferred from first possession (Friedman & Neary, 2008) and so the results obtained were not surprising. The objects used in the experiments in Chapter 2 were rated more strongly in terms of their gender stereotype. According to the ratings from Campenni's study, (1999) a jewellery box and a baby doll were rated as only appropriate for girls, and a truck and football gear were rated as only appropriate for boys (although as mentioned previously the masculine objects did receive lower ratings than the feminine objects). When stronger sex stereotyped items were used results demonstrated that ownership was not directly inferred from first possession, but that gender stereotypes were used to guide ownership decisions.

Overall the results of Chapter 2 suggest that adults and children can take stereotypes into account in ownership decisions. Experiment 1 demonstrates that gender stereotypes are used in ownership decisions in favour of first possession, and

the results of Experiment 2, where ownership decisions were based on age stereotypes, shows that the use of stereotypes is not specific only to gender, but includes other stereotypes, and illustrates that both adults and children are aware that different kinds of people use and own different kinds of objects.

5.4. The role of constructive possession in ownership decisions

The two experiments investigating the role of constructive possession in the current thesis (Chapter 3) demonstrated that adults and children base ownership decisions on constructive possession, despite the fact they are largely unaware of this legal doctrine. In the first experiment, where constructive possession was established by setting the stories in the bedroom of one of the characters, both adults and children made ownership decisions in line with constructive possession, when this was pitted against first seen possession. The same pattern of results was observed in Experiment 4, where constructive possession was established by placing objects in a hat rather than a bedroom. Adults and children based their ownership decisions on constructive possession, when this was pitted against first seen possession. Establishing constructive possession using a hat rather than a bedroom also showed that the results were not a result of the employment of a brute rule of “everything in a person’s bedroom belongs to them.” These results are in line with outcomes from cases in law, where a person, having the power and intention to exercise control over an object, has been considered to have constructive possession of it, and is deemed to be the owner, despite not being the first possessor of the object (People V Vander Heide, 1920; State V Parent, 1920).

The ownership decisions of the adults and children in Chapter 3 challenge previous accounts of ownership, such as that of Friedman & Neary (2008), who claim

that ownership of objects is directly inferred from first seen possession. If this was the case then, regardless of whether first seen possession was in conflict with constructive possession or not, the first seen possessor should have been chosen as the owner of the object in all cases. Results clearly showed that, when first seen possession was in conflict with constructive possession, adults and children based their decisions on constructive possession significantly more often than first seen possession, demonstrating that something other than a direct inference must account for the results obtained. The results also challenge the association account of ownership (Blake & Harris, 2011). The requirements of the association account are a visual association between a person and an object, and intentional use of the object by that person. First seen possession of an object fulfils both of these requirements. The premise of constructive possession however is that, whilst a person must have the power and intention to exercise control of an object, they do not need to be seen intentionally using it, or indeed with the object at all. If ownership decisions were based on a visual association then again it would be expected that the first seen possessor of the object would have been chosen as the owner in all scenarios. As stated above this was not the case, with ownership decisions being based on constructive possession when this was in conflict with first seen possession.

The results from the experiments in this chapter can be more parsimoniously explained by the historical account of ownership (Friedman, Van de Vondervoort, Defeyter & Neary, 2013). Based on this account adults and children will use the information available to them to reconstruct the history of the object, in order to determine who is most likely to have had past contact with the object, having acquired it in a way that grants them legitimate ownership of it. If there is no information to suggest that subsequent transfers of ownership have been made, then this person will be deemed to be the owner of the object. In these experiments, when constructive

possession is pitted against first possession, a reconstruction of the history, based on the information available, leads to the conclusion that the constructive possessor had past contact with the object, in a way that granted them ownership of it.

5.5. The role of history in ownership decisions

In Chapter 4 objects which normatively come in pairs, such as gloves, wellington boots and earrings, were used to more directly explore the role of history in ownership decisions. Results from Experiment 5 demonstrated that when one character is wearing an object, and another character is holding the matching object, both adults and children deem the wearer to be the owner of the held object, despite not being seen with it at any point in the story. When the object being held does not match the object being worn adults choose the holder as the owner of the held object whereas children's decisions are at chance. In Experiment 6 information was given by one of the characters, which enabled the history of the object in question to be more easily constructed. In one scenario one character was thanking the other character for allowing them to try on the object, and in the other scenario one character was thanking the other character for finding an object they had been looking for. In this experiment adults based their ownership decisions on the historical information, regardless of whether or not the object being worn and the object being held matched. The results of the children were less clear with some ownership decisions being based on history and others at chance levels.

The results from this chapter are broadly consistent with previous research, demonstrating that children use historical information when deciding what an object is supposed to be (Bloom & Markson, 1998), when deciding on the function of an object

(Jaswal, 2006), and when deciding who owns an object (Bloom & Markson, 1998; Gelman, Manczak & Noles, 2012; Friedman, Van de Vondervoort, Defeyter & Neary, 2013). As previously mentioned in Chapter 4, “history” can mean different things. The previously mentioned studies regarding object names and functions involve history. However in these studies children were explicitly given historical information and asked to use it in function and ownership decisions about the object. The “history” referred to in the study of Gelman, Manczak and Noles (2012) was also different to the “history” in the experiments in Chapter 4. The experiments in Chapter 4 of this thesis required adults and children to infer which character had a legitimate claim of ownership over the target object, through a reconstruction of the history of the object, based on the ownership information they were given in the stories; an arguably more difficult task than the visuo-spatial tracking of an object over time, or indeed making use of historical information which has been explicitly presented.

The results of these experiments again rule out the possibility that ownership is directly inferred from first possession (Friedman & Neary, 2008). If first possession was the cue to ownership, then in Experiment 5 the character seen possessing the object in question would always have been chosen as its owner, regardless of whether the objects were a matching pair or not, and regardless of whether they were wearing or holding the object. In Experiment 6, if ownership decisions were based on first seen possession, then the character first seen possessing the object would have been chosen as the owner, regardless of the information presented through the speech of one of the characters in the story. Whilst children’s decisions were not always as consistent as adults, both adults and children did not merely choose the first possessor of the object but, at times chose, as the owner of the object, the character who had never been seen possessing the object.

These results also challenge the association account of ownership (Blake & Harris, 2011). If ownership decisions were made in this way then the most likely visual associations involving intentional use of an object, would be formed between the character holding the object and the object itself. If ownership decisions were based on visual associations then, just as if first seen possession drove ownership decisions, both adults and children should have chosen the character possessing the target objects, rather than the character who was never seen with the object. The results showed this was not the case. Adults based all their decisions on historical reasoning, and the decisions children did not make based on history were at chance, rather than based on visual associations.

The account which most fully explains the adults' results from the experiments in this chapter is the historical account (Friedman, Neary, Defeyter & Malcolm, 2011). If adults attempt to reconstruct a historical narrative, in order to infer who had past contact with an object, and as such who owns it, then giving them information inferring ownership, which makes construction of the historical narrative easier, should affect the decisions they make, and should supersede any other information available in the scenario. Results from the experiments show that, regardless of which character is seen possessing the object first, or who has the strongest visual association with an object, the ownership decisions of adults can be manipulated based on the ownership information they are provided with, which relates to the history of the object. Children did use the information inferring ownership in some of their decisions. However they were at chance levels in others. The chance results in this chapter reflect the fact that children may be confused or torn between multiple sources of information including first seen possession, visual association and historical information. Basing ownership decisions on history requires complex reasoning, as children are required to infer information and produce a narrative to

explain prior circumstances which they did not witness. When other salient information, such as first seen possession, is visible in front of them they may be swayed by this. In order to reason in line with history in these circumstances children are required to go against the physical state of affairs in order to infer ownership. It may be that children do take history into account but in complex situations, such as the ones in the experiments in this chapter children struggle to reconcile the confusion produced from multiple sources of information. The chance results may also reflect an inability to cope with the memory demands of the task, or a lack of sustained engagement with the story.

5.6 Methodological considerations and directions for future research

Before drawing conclusions, this section of the discussion will consider the methodological issues of the current thesis. Areas for improvement and directions for future research will also be considered.

One limitation of these experiments was the recruitment of children, which resulted in small sample sizes in some of the experiments in the thesis. It also resulted in relatively large differences in the mean ages of children involved in different conditions in the same experiment, particularly in Experiment 6. When conducting studies with young children a difference of a few months between the children in the conditions may also affect results. Some of the experiments in this thesis required children to remember and process a lot of information whilst also considering the ownership questions they were being presented with (Chapter 4). Older children may have coped with these demands more successfully than younger children, and therefore may have performed better leading to significant results in some conditions but not others. In future experiments it would be important to recruit a larger number

of children to ensure as far as possible that children can be age matched across conditions to ensure mean ages are more closely related.

Another limitation of the current thesis was that no justification data was collected in the experiments, and therefore the reasoning behind exactly why each answer was given could only be assumed. Collecting justification data for the decisions participants made would have provided an insight into why adults, and particularly children, responded to the scenarios and ownership questions in the way they did. In future, replicating these experiments would be important to initially ascertain whether similar results to the ones obtained in this thesis would be found in subsequent experiments. In these follow up experiments adding in a simple “why?” question after the ownership question “Who owns the?” may provide a greater understanding of the reasoning behind ownership decisions of this sort. Caution would have to be taken when interpreting the explanations of the children as some responses may be nonsense. However collecting justification data would allow a more in depth analysis of the theory behind these ownership judgments.

A further limitation is the lack of cross cultural studies into the role of history in ownership decisions, particularly amongst children. Whilst Barrett, Laurence and Margolis (2008) worked with members of the Shuar tribe from Ecuador this research investigated the role of history in function judgments rather than ownership decisions. Despite the paucity of objects within the tribe dictating that one object must be used for a number of different purposes the authors found that when asked what an object was for members of the tribe sided with history and chose the original function as determined by the creator. In future experiments it would be interesting to investigate whether adults and children appeal to history even across cultures, and the social norms associated with these cultures. Ownership seems pervasive in all countries throughout the world. Most of the human world is constructed of property (Noles &

Keil, 2011). As Rochat (2011) explains, for social life to be sustainable individuals in a group need to have a common understanding of who possesses what, why some possess more than others, and where possession begins and where it ends. According to Rochat a necessary prerequisite of any social life is closure, among those in the social group, on the issues of possession and property. This closure and shared understanding is the basis of group cohesion and ultimately the survival of the group. Rudmin (1991) also points out that everywhere we go and everything we do requires at least a momentary or even unconscious calculation of possessory relationships and rights. Historical reasoning may underpin some ownership decisions in western cultures. However it may not account for ownership decisions made in different cultures where different social norms exist. Conducting cross cultural studies would allow comparisons to be made and would provide an insight into whether the theories underpinning ownership decisions are independent of culture or whether ownership itself is a social construct that is culturally determined, with judgments dependent on the norms of the culture in which a person lives.

Future research examining ownership could also consider whether ownership reasoning affects other decisions that children make. Children reason about ownership when asked to decide who owns an object. However it is not known whether children utilise their knowledge of ownership in other every-day behaviours, such as problem solving and selection tasks. Problem solving tasks have included those investigating children's abilities to solve a problem through tool innovation or manufacture (Beck, Apperly, Chappell, Guthrie & Cutting, 2011; Cutting, Apperly & Beck, 2011). In the aforementioned study (Beck et al.) 3-11 year-olds were presented with a plastic cylinder with a bucket in the bottom containing a sticker. As the cylinder was too narrow to reach into the children were provided tools such as a pipe-cleaner and a piece of string to help them complete the task. Children could easily retrieve the

bucket with the sticker in by bending the end of one of the pipe cleaners into a hook, and pulling the bucket up by the handle. However results showed that very few of the 3-5-year-olds ever spontaneously made a hook out of the pipe-cleaner. In a following experiment, children aged 4-5 and 6-7-years-old were placed in a group that was familiarised with the objects before the task or a group that was just presented with the task. Even after familiarisation none of the younger children bent the pipe-cleaner into a hook spontaneously. After their failure children were shown how to bend the pipe-cleaner to make a hook shape. Most children succeeded at the task after this demonstration showing it was not their inability to manipulate the objects that led to their failure in the innovation task. A similar study (Cutting, Apperly & Beck, 2011) repeated the study described above but also added in a second tool innovation task which required children to unbend a pipe-cleaner in order to be long enough to push a ball from a tube. Results from this study also showed that before children were given a demonstration of how to make the hook they were unsuccessful at solving the problem. Children performed slightly better with the bent pipe-cleaner problem however still yielded low success rates. The authors of the studies suggested that the reason children performed better in the task once they had seen a demonstration was because they rely on social learning, which makes them less likely to seek their own solutions to problems choosing instead to observe how adults solve problems and copy this.

Another explanation however may involve ownership reasoning. Children may not fail the task because they lack the competence to innovate but rather that they fail to demonstrate this competence because their understanding of ownership dictates that they cannot manipulate an object in any way they please, unless they are given permission to do so by the owner. Once children have seen the owner manipulating the objects, and have been invited to do so themselves, their success rates in the

tasks increase. In future, similar problem solving tasks could be carried out to test whether children fail at tasks because of their hesitation to use objects in situations where they are unsure of their permission to do so. Children could be explicitly informed that the tools available to help solve the task belong to them, and can be used as they wish. Children could then be observed to ascertain if their success rates at completing the task increase.

A possible future study to test selection tasks could pit visual array against ownership. In this task children could be presented with pom poms set up in a particular pattern (see Figure 5.1)



Figure 5.1 Potential visual arrangement of the pom poms.

In the control condition the child would be told, “Here are 2 pom poms, and here are 3 pom poms.” In the ownership condition the child would be told, “Here are 3 pom poms, these two pom poms are mine.” Following this the child could then be asked to give the experimenter 2 pom poms. It would be expected that in the control condition, where the pom poms were not specifically labelled as belonging to anyone, the child would pick up the 2 pom poms grouped together and hand them to the experimenter. In the ownership condition, if the child was using ownership reasoning, then, regardless of the visual arrangement and the grouping of the pom poms, when asked to give 2 pom poms to the experimenter they would choose 2 from the set of 3 rather than picking up pom poms which they have been told belong to the experimenter. If children did reason in this way then it would demonstrate that an understanding of ownership does not just affect their judgments in direct ownership decisions where they must choose who owns an object but also that they can apply their ownership

knowledge to everyday situations and use this knowledge in their everyday behaviours.

The research presented in this thesis has demonstrated that children aged 3 – 4-years-of-age are capable of sophisticated reasoning about ownership. Children understand that different kinds of people use and own different kinds of objects, but also that ownership is also based on single agents and their relationship with an object. At the moment however it is unclear whether younger children, under the age of 2 years reason about ownership. Hay (2006) established that children use possessive pronouns between the ages of 18-24 months, which could reflect the beginnings of an understanding of ownership. Fasig (2000) also demonstrated that children between 18-24 months-old could differentiate between their own objects and the objects of others. However beyond this little is known about the capabilities of young children in relation to understanding ownership. As children get older they gain a deeper understanding of ownership as they spend more time interacting with objects. However it is unclear where an initial understanding of ownership comes from.

According to Piaget (1960) children construct their own knowledge by interacting with the world around them. As the child interacts with objects they come to realise that things have an independent existence, occupying their own space and continuing to exist even out of sight. Piaget purports that it takes time for children to work this out and many of these aspects of knowledge are not present until 9 months of age. In contrast Baillargeon (1987) showed that children demonstrated knowledge regarding the properties of objects, such as object permanence, by the ages of 3 and a half months. Spelke and Kinzler (2007) claimed that unlike Piaget claimed children do not acquire their knowledge only through interactions with the world, but rather that

they are endowed with separable systems of core knowledge which form the foundation for new skills and belief systems.

One way of testing whether young children have any comprehension of ownership would be through simple violation of expectancy studies. Young children could be shown scenarios similar to those in the studies of Rossano, Rakoczy and Tomasello (2011), in which an owner's rights are violated or upheld by another character. If children comprehend ownership, and the rights it affords the owner, they should spend longer looking at the scenarios in which owners' rights are violated, than the scenarios where the rights of the owners are upheld. Whilst these types of studies could not answer the question of whether ownership is learnt or is a result of core knowledge they could provide evidence as to whether any understanding of ownership exists in young children and infants.

5.7. Conclusions

The current series of experiments extends previous literature investigating how adults and children make ownership decisions. Overall the findings challenge previous theories of ownership based on first possession and visual association (Friedman & Neary, 2008; Friedman, 2008; Blake & Harris, 2011). Chapter 2 demonstrated that adults and children take age and gender stereotypes into account in ownership decisions, and these stereotypes are weighted more strongly than first possession, when the two are in conflict. These findings support previous literature demonstrating the effect of gender stereotypes on children's performance in games, toy preferences, and endorsements of toys for different genders, (Montemayor, 1974; Bradbard & Endsley, 1983; Martin, Eisenbud & Rose, 1995; Shutts, Banaji & Spelke, 2010). However they challenge the findings of Friedman (2008), who found that

adults made decisions in line with first possession, regardless of whether the objects were gender stereotyped. The difference in results between Friedman's study and the experiments in Chapter 2 is most likely accounted for by the weak gender stereotypes used in Friedman's study.

The findings from Chapter 3 demonstrate that both adults and children chose to base ownership judgments on constructive possession when this was in conflict with first possession. Whilst these findings support cases in law they contradict the findings of Friedman and Neary (2008) who claim ownership is directly inferred from first possession. The findings also challenged the theory of Blake and Harris (2011) who postulated that visual associations are the basis of ownership decisions. The theory which the results most closely support is that of a historical narrative (Friedman, Neary, Defeyter & Malcolm, 2011) in which adults and children attempt to reconstruct the history of an object in order to infer who was most likely to have past contact with the object, and who has a legitimate claim of ownership over it. The findings from Chapter 4 also support this theory, demonstrating that both children's and adults' ownership decisions can be manipulated based on historical information, regardless of first possession and visual associations, again challenging previous ownership theories (Friedman & Neary, 2008; Blake & Harris, 2011). Whilst children's ownership decisions were not always above chance, the decisions that were significant were in line with historical reasoning. Children may have struggled with the task due to being confused by the amount of information they were presented with, or being unable to retain and process the information given to them in order to make their ownership decisions. This could have led to some children merely guessing the answers. The lack of some significant results from the children in this study however does not substantially challenge the historical narrative as a potential theoretical framework underpinning some ownership decisions of this nature.

APPENDICES

Appendix 1: Letter to schools

Appendix 1.1: Example letter sent to schools prior to testing for all studies (Ch. 2, 3 & 4)

Date

«Head_Teacher»

«Name_of_School»

«Address1», «Address_2», «Address_3»

Dear «Head_Teacher»,

We are carrying out a project funded by Northumbria University, to investigate how children decide who owns an object when they are not explicitly told. It is known that when children are shown stories of one character possessing an object, followed by a second character, children will choose the first possessor as the owner. However these stories included little other information that children could base their decision on. The aim of our current study therefore is to examine whether children will take other information into account in their ownership decision when it is available to them, even if it conflicts with first possession.

We are currently recruiting children, aged 3-4 years-old, from nursery and primary schools in the North East to help us with this research project, and we would be delighted if your school would participate in this project.

Participating children take part either in the morning or the afternoon depending on their availability. Children will be shown short stories of characters with different objects. The investigator will show the child each page and will read the words out to them. Once children have seen the story and had the words read to them they will be asked who owns the object in question. Following their answer the investigator will move onto the next story. The whole procedure will last no more than 15 minutes. We will make every effort to keep any disruption to classroom routine to a minimum and we will cover all associated costs.

For your information, we have enclosed a copy of the parental consent form and information for participants. The project has been ethically approved and all researchers have clearance from the UK Criminals Records Bureau.

Please return the attached school consent form in the SAE to indicate your interest in taking part. If you indicate that you are interested in taking part, a member of the research team will contact you in the near future with a view to arranging a meeting in order to discuss the project further. Meanwhile, please feel free to contact us if you have any queries about this research.

Yours faithfully

Miss Sarah Malcolm
Researcher
sarah.l.malcolm@northumbria.ac.uk

Dr. Greta Defeyter
Project Supervisor
greta.defeyter@unn.ac.uk

Research Project: How do children and adults infer object ownership?

Researchers: Miss Sarah Malcolm and Dr. Greta Defeyter

School Consent form for «Name_of_School» School

I have read and understood all the information provided and I hereby **give / do not give** * consent for the above study to take place at the above named school.
***(please delete as applicable)**

Name: (please print).....

Title: please print).....

Signed:.....Date:.....

Miss Sarah Malcolm
Researcher
sarah.l.malcolm@northumbria.ac.uk

Dr. Greta Defeyter
Project Supervisor
greta.defeyter@unn.ac.uk

Please return this form in the enclosed SAE. If you have any queries please contact:

Miss Sarah Malcolm
Division of Psychology
Northumbria University
Newcastle-upon-Tyne
NE1 8ST
(0191) 243 7029
sarah.l.malcolm@northumbria.ac.uk

Appendix 2: Information for Participants

Appendix 2.1: Example information given to participants (adults) prior to the commencement of each study (Ch. 2, 3 & 4)

Research Project: How do adults and children infer object ownership?

Information for participants

What is the project about?

This study investigates what information people use to decide who owns an object when explicit information regarding ownership is not provided.

Why have I been selected to take part?

You have been selected because you are a healthy adult.

What will I have to do?

This study will require you attend a testing session held in the Cognition and Communication Centre in Northumbria University. On attending this session you will be met by the investigator who will explain the procedure to you. After signing a consent form you will be asked to read short stories involving characters using different objects. Immediately after each story you will be asked to judge which character owns the target object, and tick the appropriate box. The whole procedure should last no longer than 10 minutes.

Are there any reasons why I should not take part?

There are no reasons why you should not take part.

Will my participation involve any physical or psychological discomfort?

All procedures in this study have been risk assessed and will provide no physical or psychological discomfort.

How will confidentiality be assured?

You will be given a unique participant number which will be kept with your data, your consent form will be stored separately in a locked cabinet.

Who will have access to my information?

All information will be treated with strict confidence and only the main researcher and project supervisor will have access to the information you give us. No information which can lead to the identification of any participant will be revealed in any reports, or to any other people.

How will my information be stored/used in the future?

Your consent form and data will be stored separately in locked filing cabinets within the centre for cognition and communication, in accordance with the Data Protection Act. During this time the data will be used by members of the research team only for purposes associated with the research question. Should the results of this study be presented your data will not be personally identifiable. All data will be destroyed a certain length of time after completion of the study.

Has this study received appropriate ethical clearance?

Yes. The study and the protocol have received full ethical approval from the School of Psychology and Sports Sciences Ethics committee.

What if I decide to take part but decide later I want to withdraw?

You can pull out from the study any time you like. If you wish to pull out after testing is finished, please contact Sarah Malcolm on 0191 243 7029 or sarah.l.malcolm@northumbria.ac.uk. You will be asked to state your participant number and following this all your data will be destroyed.

Will I receive individual feedback on my performance?

We are unable to provide you with individual feedback about your performance. Overall feedback is available and can be requested after the study from Sarah Malcolm on 0191 243 7029 or sarah.l.malcolm@unn.ac.uk

Thank you for your interest

Miss Sarah Malcolm
Researcher
sarah.l.malcolm@northumbria.ac.uk

Dr. Greta Defeyter
Project Supervisor
greta.defeyter@unn.ac.uk

Appendix 2.2: Example information given to participants (parents of children) prior to the commencement of each study (Ch. 2, 3 & 4)

Research Project: How do adults and children infer object ownership?

Information for participants

What is the project about?

This study investigates what information children use to decide who owns an object when explicit information regarding ownership is not provided.

Why has your child been selected to take part?

Your child has been chosen because they fall within the age range for this particular study.

What will your child have to do?

The investigator will come to the nursery/ school to carry out the study. Your child will be met by the investigator who will explain the study to the child. Your child will be shown picture based stories of boys and girls playing with different. Your child will be asked who they think owns the object in each story. The investigator will then make a note of this and move on to the next story. The whole procedure should take no more than 15 minutes.

Are there any reasons why my child should not take part?

There are no reasons why your child should not take part.

Will participation involve any physical or psychological discomfort for my child?

All procedures in this study have been risk assessed and will provide no physical or psychological discomfort.

How will confidentiality be assured?

Your child will be given a unique participant number which will be kept with your data. Your child's consent form will be stored separately in a locked cabinet.

Who will have access to my child's information?

All information will be treated with strict confidence and only the main researcher and project supervisor will have access to the information your child gives us. No information which can lead to the identification of any participant will be revealed in any reports, or to any other people.

How will my child's information be stored/used in the future?

Your child's consent form and data will be stored separately in locked filing cabinets within the centre for cognition and communication, in accordance with the Data Protection Act. During this time the data will be used by members of the research team only for purposes associated with the research question. Should the results of this study be presented, your child's data will not be personally identifiable. All data will be destroyed a certain length of time after completion of the study.

Has this study received appropriate ethical clearance?

Yes. The study and the protocol have received full ethical approval from the School of Psychology and Sports Sciences Ethics committee. The investigator also has an enhanced CRB check, a copy of which will be retained by the nursery. If you require confirmation of this please contact the Chair of School of Psychology & Sports Sciences Ethics Committee, Northumberland Building, Northumbria University, Newcastle Upon Tyne, NE1 8ST. Please state the title of the research and the name of the principle investigator.

Will my child receive any reward for taking part?

Your child will receive no financial rewards for taking part in this study. However small tokens, such as pens and pencils will be given to your child to thank them for taking part.

What if I decide to allow my child to take part but later decide I want to withdraw them?

You can remove your child's data from the study any time you like. If you wish to pull them out after testing is finished, please contact Sarah Malcolm on 0191 243 7029 or sarah.l.malcolm@northumbria.ac.uk. You will be asked to state your child's participant number and following this all their data will be destroyed.

Will I receive feedback on my child's performance?

We are unable to provide you with individual feedback about your child. However, at the end of the project a summary of the research will be sent to your school. If you require further feedback please contact Sarah Malcolm directly.

Thank you for your interest

Miss Sarah Malcolm
Researcher
sarah.l.malcolm@northumbria.ac.uk

Dr. Greta Defeyter
Project Supervisor
greta.defeyter@unn.ac.uk

Appendix 3: Consent forms

Appendix 3.1: Example consent form (adult) for all ownership studies (ch. 2, 3 & 4)

Research Project: How do children and adults infer object ownership?

Researchers: Miss Sarah Malcolm and Dr. Greta Defeyter

**Participant ID
Number: (please
leave blank)**

Please read and complete this form carefully.

*please tick
if applicable*

I have 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 would like to receive feedback on the overall results of the study at the email address given below. I understand that I will not receive individual feedback on my own performance.
Email address.....

Name..... D.O.B.....

Sex M / F

Signature

Appendix 3.2: Example consent form (parents of children) for all ownership studies (ch. 2, 3 & 4)

Research Project: How do children and adults infer object ownership?

Consent form for research project taking place at <Name of School>.

Researchers: Miss Sarah Malcolm and Dr. Greta Defeyter

**Participant ID
Number: (please
leave blank)**

Please read and complete this form carefully.

*please tick
if applicable*

I have read and understood the Participant Information Sheet.	<input type="checkbox"/>
I have had an opportunity to ask questions and discuss this study and I have received satisfactory answers.	<input type="checkbox"/>
I understand I am free to withdraw my child from the study at any time, without having to give a reason for withdrawing, and without prejudice.	<input type="checkbox"/>
I agree for my child to take part in this study.	<input type="checkbox"/>
I would like to receive feedback on the overall results of the study at the email address given below. I understand that I will not receive individual feedback on my own child's performance. Email address.....	<input type="checkbox"/>

Child's name.....D.O.B.....

Sex M / F

Signature of Parent / Guardian.....

Please return this form to your child's class teacher as soon as possible

Appendix 4: Debrief

Appendix 4.1: Example debrief given to adults following the completion of each study (Ch.2, 3 & 4)

Research Project: How do adults and children infer object ownership?

Researchers: Miss Sarah Malcolm and Dr. Greta Defeyter

Participant ID number (for admin use only) _____

1. What was the purpose of the project?

Previous studies have demonstrated that in the absence of explicit information regarding the ownership of an object, it is usually assumed that the first person to possess the object is its owner. The aim of this study was to see if ownership judgments were influenced by other information available in the scenario, or whether they would be based on first possession regardless of any competing information.

2. How will I find out about the results?

As is standard research practice no individual feedback will be given, however general feedback will be emailed to those who requested it on the consent form following completion of the studies.

3. How will the results be disseminated?

The results of the study will be used for a PhD thesis, in conference talks and a peer reviewed article. Your data will be generalised and your personal information will never be identifiable.

4. Have I been deceived in any way?

You have not been deceived in any way during this study.

5. What do I do if I wish to withdraw my data after my participation?

If you wish to withdraw at any time, please contact Miss Sarah Malcolm on (0191) 243 7029 or sarah.l.malcolm@northumbria.ac.uk and state your unique participant ID number. Your data will then be immediately destroyed.

Thank you again for taking part in this study,

Yours faithfully

Miss Sarah Malcolm
Researcher
sarah.l.malcolm@northumbria.ac.uk

Appendix 4.2: Example debrief given to parents following the completion of each study (Ch. 2, 3 & 4)

Research Project: How do adults and children infer object ownership?

Researchers: Miss Sarah Malcolm and Dr. Greta Defeyter

Participant ID number (for admin use only) _____

1. What was the purpose of the project?

Previous studies have demonstrated that in the absence of explicit information regarding the ownership of an object, it is usually assumed that the first person to possess the object is its owner. The aim of this study was to see if ownership judgments were influenced by other information available in the scenario or whether they would be based on first possession regardless of any competing information.

2. How will I find out about the results of my child?

As is standard research practice no individual feedback will be given, however general feedback will be sent to your child's school.

3. How will the results be disseminated?

The results of the study will be used for a PhD thesis, in conference talks and a peer reviewed article. Your child's data will be generalized and your child's personal information will never be identifiable.

4. Has my child been deceived in any way?

No they have not been deceived in any way during this study.

5. What do I do if I wish to withdraw my child's data after my participation?

If you wish to withdraw your child at any time, please contact Miss Sarah Malcolm on (0191) 243 7029 or sarah.l.malcolm@northumbria.ac.uk and state your child's unique participant ID number. Your child's data will then be immediately destroyed.

Thank you again for allowing your child to participate in this study,

Yours faithfully

Miss Sarah Malcolm
Researcher
sarah.l.malcolm@northumbria.ac.uk

Appendix 5: Example Stimuli

Appendix 5.1: Example stimuli for Experiment 1 in Chapter 2

Match condition: Example stories with all objects

1



Emily is playing with the jewellery box
Emily likes playing with the jewellery box

2



Charlie is playing with the jewellery box
Charlie likes playing with the jewellery box

3



1



Jake is playing with the truck
Jake likes playing with the truck

2



Rachel is playing with the truck
Rachel likes playing with the truck

3



Appendix 5.1: Continued

1



Jenny is playing with the doll
Jenny likes playing with the doll

2



John is playing with the doll
John likes playing with the doll

3



1



Jake is playing with the football and goalie gloves.
Jake likes playing with the football and goalie gloves.

2



Rachel is playing with the football and goalie gloves.
Rachel likes playing with the football and goalie gloves.

3



Appendix 5.1: Continued

Conflict condition: Example stories with all objects

1



**Charlie is playing with the jewellery box
Charlie likes playing with the jewellery box**

2



**Emily is playing with the jewellery box
Emily likes playing with the jewellery box**

3



1



**Rachel is playing with the truck
Rachel likes playing with the truck**

2

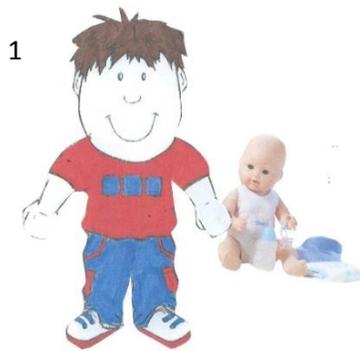


**Jake is playing with the truck
Jake likes playing with the truck**

3



Appendix 5.1: Continued



John is playing with the doll
John likes playing with the doll



Jenny is playing with the doll
Jenny likes playing with the doll



Rachel is playing with the football and goalie gloves.
Rachel likes playing with the football and goalie gloves



Jake is playing with the football and goalie gloves.
Jake likes playing with the football and goalie gloves.



Appendix 5.2: Example stimuli for Experiment 2 in Chapter 2.

Match condition: Example stories with all objects

1



Dave is 45 years old
He is using the car keys to open the door

2



Rob is 6 years old.
He is using the car keys to open the door

3



1



Dave is 45 years old
He is playing with the building blocks

2



Rob is 6 years old
He is playing with the building blocks

3



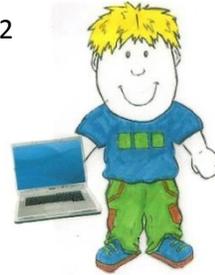
Appendix 5.2: Continued

1



Dave is 45 years old
He is using the laptop to play computer games

2

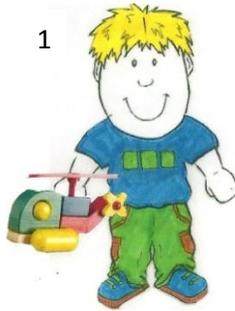


Rob is 6 years old
He is using the laptop to play computer games

3



1



Rob is 6 years old.
He is playing with the toy helicopter

2



Dave is 45 years old.
He is playing with the toy helicopter

3



Appendix 5.2: Continued

Conflict condition: Example stories with all objects

1



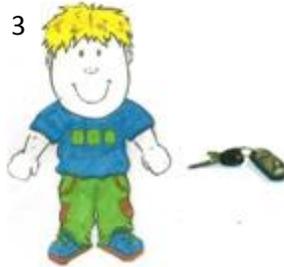
Rob is 6 years old.
He is using the car keys to open the door

2



Dave is 45 years old
He is using the car keys to open the door

3

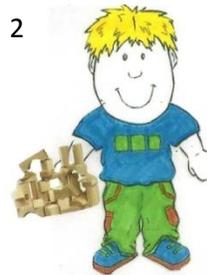


1



Dave is 45 years old
He is playing with the building blocks

2



Rob is 6 years old
He is playing with the building blocks

3



Appendix 5.2: Continued

1



Rob is 6 years old
He is using the laptop to play computer games

2



Dave is 45 years old
He is using the laptop to play computer games

3



1



Rob is 6 years old.
He is playing with the toy helicopter

2



Dave is 45 years old.
He is playing with the toy helicopter

3



Appendix 5.3: Example Stimuli for Experiment 1 in Chapter 3
Control condition: Example stories with all objects

1



**Emma is playing with the book
She likes playing with the book**

2



**Josh is playing with the book
He likes playing with the book**

3



1



**Charlie is playing with the mug
He likes playing with the mug**

2

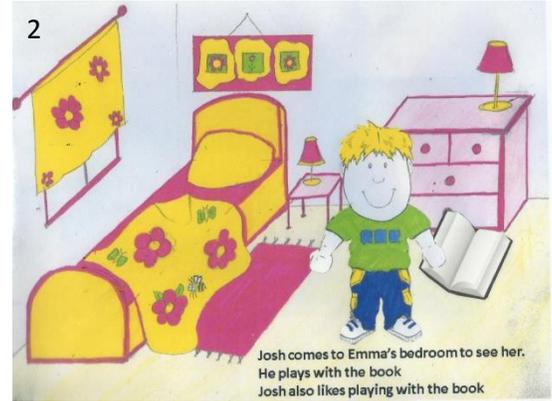
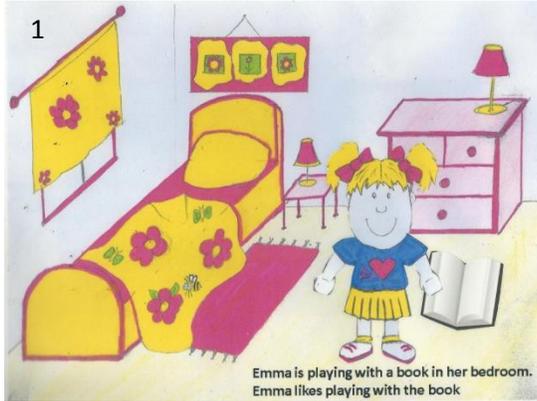


**Emily is playing with the mug
She likes playing with the mug**

3



Match condition: Example stories with all objects



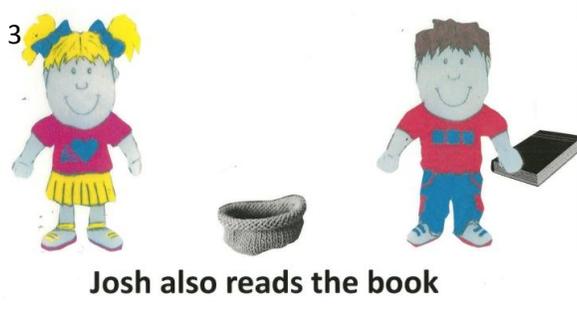
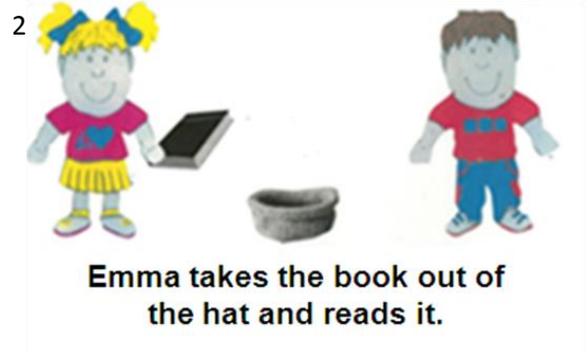
Appendix 5.3: Continued

Conflict condition: Example stories with all objects



Appendix 5.4: Example Stimuli for Experiment 2 in Chapter 3

Control condition: Example stories with all objects



Appendix 5.4: Continued

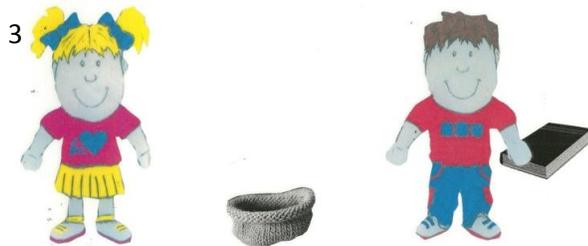
Match condition: Example stories with all objects



This is a book in Emma's hat



Emma takes the book out her hat and reads it



Josh also reads the book



This is a mug in Charlie's hat



Charlie takes the mug out of his hat and plays with it

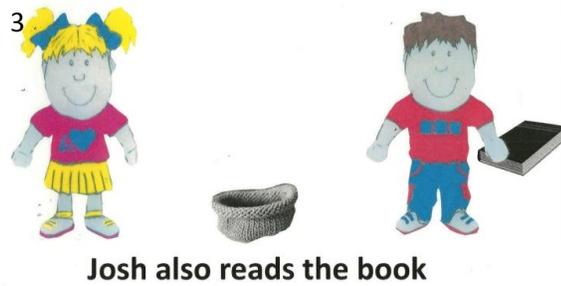
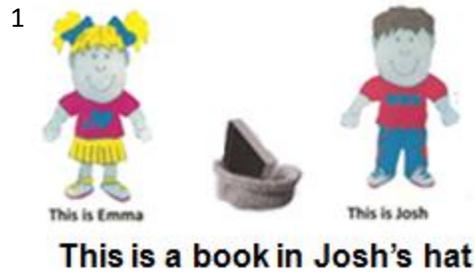


Emily also plays with the mug



Appendix 5.4: Continued

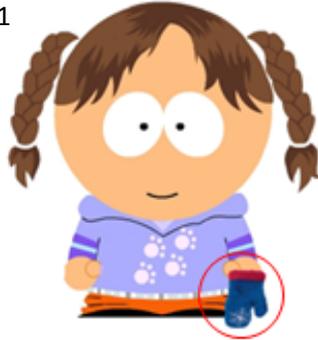
Conflict condition: Example stories with all objects



Appendix 5.5: Example Stimuli for Experiment 1 in Chapter 4

Match condition: Example stimuli with all objects

1



This is Jessica

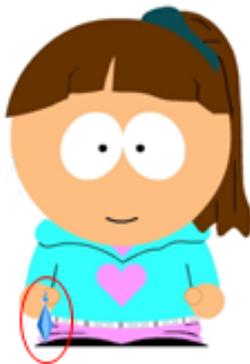
Jessica is holding a mitten



This is Abbey

Abbey is wearing a mitten

2



This is Anna

Anna is holding an earring



This is Charlotte

Charlotte is wearing an earring

3



This is Lara

Lara is holding a wellington boot



This is Stephanie

Stephanie is wearing a wellington boot

Appendix 5.5: Continued

Conflict condition: Example stimuli with all objects.

1



This is Jessica
Jessica is holding a mitten



This is Abbey
Abbey is wearing a mitten

2



This is Anna
Anna is holding an earring



This is Charlotte
Charlotte is wearing an earring

3



This is Lara
Lara is holding a wellington boot



This is Stephanie
Stephanie is wearing a wellington boot

Appendix 5.6: Example Stimuli for Experiment 2 in Chapter 4

Match Condition: Example stimuli with all objects, where one character is trying on the object



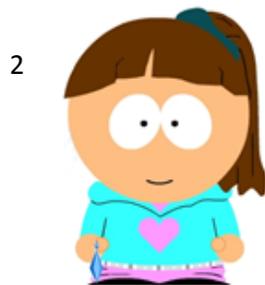
This is Jessica

Jessica is holding a mitten



This is Abbey

Abbey is wearing a mitten



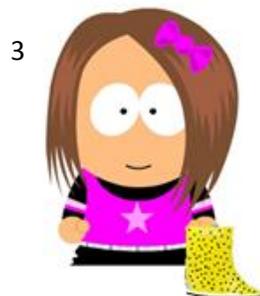
This is Anna

Anna is holding an earring



This is Charlotte

Charlotte is wearing an earring



This is Lara

Lara is holding a wellington boot



This is Stephanie

Stephanie is wearing a wellington boot

Appendix 5.6: Continued

Match Condition: Example stimuli with all objects, where one character is looking for the object

1



This is Jessica

Jessica is holding a mitten



This is Abbey

Abbey is wearing a mitten

Thanks. I've been looking for that glove

2



This is Anna

Anna is holding an earring



This is Charlotte

Charlotte is wearing an earring

Thanks I've been looking for that earring

3



This is Lara

Lara is holding a wellington boot



This is Stephanie

Stephanie is wearing a wellington boot

Thanks I've been looking for that wellington boot

Appendix 5.6: Continued

Conflict Condition: Example stimuli with all objects, where one character is trying on the object

1



This is Jessica
Jessica is holding a mitten

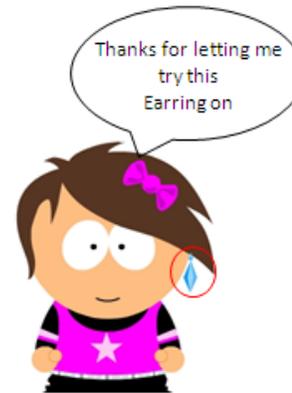


This is Abbey
Abbey is wearing a mitten

2



This is Anna
Anna is holding an earring



This is Charlotte
Charlotte is wearing an earring

3



This is Lara
Lara is holding a wellington boot



This is Stephanie
Stephanie is wearing a wellington boot

Appendix 5.6: Continued

Conflict Condition: Example stimuli with all objects, where one character is looking for the object

1



This is Jessica

Jessica is holding a mitten

Thanks.
I've been
looking for that
glove



This is Abbey

Abbey is wearing a mitten

2



This is Anna

Anna is holding an earring

Thanks.
I've been
looking for that
earring



This is Charlotte

Charlotte is wearing an earring

3



This is Lara

Lara is holding a wellington boot

Thanks.
I've been
looking
for that
wellington boot



This is Stephanie

Stephanie is wearing a wellington boot

Appendix 6: Example answer sheets given to adults for each story in all studies (Ch. 2, 3 & 4)

Who owns the [insert object name]

Please tick one box

<<Character name>> <<Character name>>

Appendix 7: Published Articles

Appendix 7.1: Ownership and Object History.

Paper accepted in New Directions for Child and Adolescent Development

Ownership and Object History

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Abstract

We propose accounts of how people judge whether an object is owned, and if so by whom. Our central claim is that both judgments often involve making inferences about object history. In judging whether objects are owned, people may assume that artefacts (e.g., chairs) are owned and that natural objects (e.g., pinecones) are not. However, people may override these assumptions by inferring the history of intentional acts made in relations to objects. In judging who owns an object, people may often consider which person likely possessed the object in the past—such reasoning may be responsible for people’s bias to assume that the first person known to possess an object is its owner.

Ownership and object history

Ownership constrains behavior towards objects. Suppose you see an interesting magazine on one of the few empty seats in a crowded subway car. You want to read the magazine, but whether you do likely depends on ownership. If the magazine is not owned (perhaps it was purposely left on the subway), then you may do with it as you choose—you may read it, tear out a picture, and even acquire the magazine as your own property. However, if the magazine is owned then you will not be allowed to take any of these actions without requesting permission from the owner; knowing who owns the magazine will help you direct your request to the correct person.

This example reveals two sorts of judgments that can be drawn about the ownership of an object: 1) judgments about *whether* the object is owned or not; and 2) judgments about *who* the owner is. Both judgments are typically easy to make given the history of the object, and specifically its history in relation to people. Suppose you know that the woman sitting next to the magazine purchased it, brought it onto the subway, briefly read it, and then put it on the empty seat next to her. Given this knowledge about the magazine's history, it probably belongs to the woman. However this conclusion is not completely certain because if the woman intended to discard the magazine when she put it on the empty seat then she would no longer own it. Thus, even more clarity is gained when the history of the object includes the history of people's intentions regarding it.

It is rare to have this much knowledge of object history and others' intentions. Yet it is typically still possible to judge whether objects are owned, and by whom. In the current paper, we consider how these judgments are made when object history is largely unknown. We propose that a common property may underlie both types of judgments: In both, reasoning operates to reconstruct the history of the object in relation to people and their intentions. In what follows, we outline accounts for how both types of judgment are made. The accounts are

loosely inspired by previous theories claiming that judgments about objects often depend on making inferences about their history (Bloom, 1996; Leyton, 1987).

Inferring Whether Objects are Owned

People often quickly judge whether various objects are owned. Suppose while walking outside, you see on the ground a pinecone, an old bottle-cap, and a shiny diamond ring. It seems likely that the diamond ring is owned, but that the pinecone and the bottle-cap are not. What is responsible for these intuitions?

One possibility is that such intuitions are the output of simple rules which specify at approximately the basic level whether certain categories of objects are owned—rules like *diamond rings are owned* and *pinecones are not owned*. Although people may use such “specific” rules sometimes, there are three reasons that people must have other ways of judging what is owned. First, there are countless object types, and so using specific rules would require people to learn a huge number of ownership rules, and it is not obvious that people have sufficient experience with objects in each category to learn whether they are owned. Second, sole reliance on specific rules would leave people unable to judge whether unfamiliar and novel objects are owned. But it seems unlikely that people typically have such difficulty (e.g., an unfamiliar tool is owned by someone, while an unfamiliar plant in a forest is not). Third, although some types of objects are typically owned (e.g., diamond rings) and others types typically not owned (e.g., pinecones), people appreciate that there are exceptions—some diamond rings are not owned, and some pinecones are. If people solely relied on specific rules like “pinecones are owned” they could not appreciate such exceptions.

A more promising possibility is that people more often rely on two object-kind rules: 1) artefacts (e.g., bottle-caps, diamond rings) are owned, 2) natural kinds (pinecones) are not.ⁱ By relying on these two rules, people would avoid the need to learn a vast number of ownership rules; the two rules cover virtually all objects. Using the two object-kind rules also

allows people to have intuitions about whether novel objects are owned, so long as it is possible to judge whether the objects are artefacts or natural kinds.

We have obtained findings broadly consistent with the possibility that people use such rules, in the first study (to our knowledge) of people's intuitions about which objects are likely to be owned or not (Neary, Friedman, & Karpova, in preparation). This study investigated children aged three to six. In one experiment, children saw unfamiliar artefacts and natural kinds in pairs. In judging which item from each pair belongs to a depicted character, children aged three and older chose artefacts over natural kinds. However, when children were asked which item from each pair is preferred by the character, they chose between the items at chance. In other experiments, children saw unfamiliar objects one-at-a-time, and judged whether each is owned. Here, most children aged three and up judged that unfamiliar natural kinds are not owned. These children were more likely to judge that artefacts are owned, though it was only at ages five and six that children judged artefacts as owned at rates greater than chance. Overall, the findings suggest that children have differing expectations about whether unfamiliar artefacts and natural kinds are owned or not.

Regardless, relying on object-kind rules is not enough. As noted earlier, although it may typically be assumed that artefacts are owned and that natural kinds are not, there are obvious exceptions. A bottle-cap on the ground outside is probably not owned, and a beautiful leaf on the centre of an office desk is probably owned. One way to modify the object kind account so that it can accommodate such exceptions is to add additional rules, such as: objects found on private property (e.g. leaf found on desk) are owned, low-value objects not on private property (e.g., bottle-cap on ground) are not owned. However, no matter how many rules are added, obvious exceptions are likely to remain. For instance, though it might seem safe to assume that a beautiful leaf on a desk is probably owned, this conclusion might change if it is autumn and an open window has allowed many leaves to blow into the room.

Instead of acquiring more rules, people may supplement the two object-kind rules by attempting to reconstruct the history of objects in relation to people. In reasoning about a natural kind object, people may begin with the default assumption that it is not owned. But people may also attempt to infer the object's history to determine whether this default should be overturned. The default assumption should be overturned when it seems likely that someone previously possessed the natural kind object, and has not purposely discarded it, but instead likely intends to possess and use it again.

For instance, when a leaf is seen on a desk, people may set aside the default assumption that as a natural kind it is un-owned—someone must have put the leaf on the desk intentionally, and that person's behavior in relation to the leaf suggests the person still owns it. If the leaf instead arrived on the desk accidentally (e.g., it blew in through an open window, along with many other leaves, which happened to instead land on the floor) then the conclusion that it is owned is weakened.

In reasoning about an artefact, people may work in the opposite direction, beginning with the default assumption that it is owned, while looking for evidence that it has been intentionally discarded and ownership relinquished. When a bottle-cap is found on the ground it is plausible that it was intentionally discarded because bottle-caps are of little value and are often purposely littered. It is difficult to reconstruct the same intentional history for a diamond ring found on the ground. Though the ring could have been discarded intentionally, it is more plausible that it was accidentally lost, and that the person who lost it would welcome it back.ⁱⁱ These examples illustrate that people probably consider factors such as an object's value and location, when judging whether it is owned. But rather than these factors figuring in simple rules (e.g., *valueless objects seen outside are not owned*), they are more likely used to reconstruct object history. This is not to suggest that people do not adhere to any simple rules of this sort in judging whether an object is owned; they may, but such rules will probably only be useful for a small fraction of the judgments made.

Inferring Who Owns an Object

Beyond judging that an object is owned, people can also judge who the owner is. Even in early childhood, many sources of information are used to draw such judgments. At age two, and probably younger, children shown a familiar object (e.g., mother's shoe) can identify the owner; at this age children can learn who owns an object when explicitly told (e.g., "These are yours"; Eisenberg-Berg, Haake, & Bartlett, 1981; Eisenberg-Berg, Haake, Hand, & Sadalla, 1979; Fasig, 2000). Children aged two and older also infer ownership by judging that the first person to possess an object is its owner (Friedman, 2008; Friedman & Neary, 2008), a method for inferring ownership discussed in detail below. At age three, children appreciate that ownership can be transferred from one person to another (Neary & Friedman, in preparation), though even four- and five-year-olds often have difficulty demonstrating this ability when they have observed the giver possess the object (Blake & Harris, 2009; Friedman & Neary, 2008, Experiments 4 and 5). And from age three and a half, children infer that an object belongs to the person who "controls permission" and decides whether others can use it (Neary, Friedman, & Burnstein, 2009).

Our focus here is on children's and adults' use of first possession in inferring ownership. In experiments demonstrating the importance of first possession for inferences of ownership, participants watch scenarios in which one character begins with a toy and plays with it, and then another character plays with it. The toy is either left with the second character or placed between them, and participants are asked which character owns it. Most participants, regardless of whether they are preschoolers or adults, choose the character who possessed the toy first (Friedman, 2008; Friedman & Neary, 2008).

In these scenarios, the toy is presumably already owned from the beginning. Judging who the owner is, then, is a matter of *discovering* a fact which has been true for some time (the fact of who happens to own the toy), and doing so on the basis of very limited information. People's choice of the character first possessing the toy is striking because either

character, or both, or neither, could be the owner, and it is not obvious why ownership inferences should be based on first possession. We consider two explanations for why first possession is used:

Acquiring ownership. Aside from making judgments about an already-owned object, people also reason about the establishment of ownership over non-owned things. Suppose Mike and Dave are walking, and Dave sees a seashell, picks it up, and puts it in his knapsack. Who owns the seashell? Judging ownership in this situation is very different from doing so in the situation where two characters each play with a toy in turn: Rather than trying to discover who the owner is on the basis of limited information, here the goal is to *decide* who the owner is when it is presumed that all of the relevant information (i.e. the history of the seashell in relation to the actions and intentions of people) is available.

When Dave picks up the seashell before Mike he may be deemed the owner. One justification for this is that he owns it because he possessed it first. The view that ownership begins with taking possession is a basic tenet of property law both in the West (Epstein, 1979) and elsewhere (Lueck, 1995). Beyond law, adults often judge that the first person to take possession over a non-owned object is its owner (Blumenthal, 2002; Friedman, 2008, Experiment 3), and young children may also heed such a rule. In deciding who establishes ownership over a non-owned object, people's reasoning may be guided by a principle to the effect that the first possessor is the owner (Friedman, 2008, p. 294; Stake, 2004, pp. 1765-1766).

Although the proper domain of this "first possessor = owner" principle might be judgments about the establishment of ownership over non-owned things, people might apply the rule more generally. They might apply the principle *whenever* they make ownership judgments, and hence use it when trying to discover who owns an already-owned object. This would explain why people choose the first possessor in situations where one child plays with a toy, and then another child plays with it—the child who plays with the toy first is the first

(known) possessor of the toy. Thus, people might choose the first possessor because they extend a first possession rule, originally developed for reasoning about the establishment of ownership over non-owned things, beyond its proper domain.

This explanation requires that people's decisions about the establishment of ownership are, in fact, based on a first possession rule. However, recent findings suggest that people may not adhere to such a rule. Although people often judge that the first person to possess an object establishes ownership over it, there are many situations where they do not. For instance, consider the following scenario:

High above the ground, a gem juts out of a cliff wall. Mike is trying to climb the cliff to get the gem. He is having great difficulty climbing, and the gem is far above him. Mike throws a rock at the gem, causing it to fall to the base of the cliff. Dave is walking by, and has seen all of this. Dave picks up the gem. Mike quickly climbs down, and they argue about who gets to keep the gem.

Who does the gem belong to? Most adults judge that Mike is the owner, even though Dave possessed it first. This finding is consistent with the alternative view that people typically make judgments about the establishment of ownership over non-owned things by favoring the person who, in pursuing an object, was *necessary* for its ultimate possession (Friedman, in press). Though Mike was not first to possess the gem, he was *probably* necessary for it to be possessed—if he had not dislodged the gem, it might still be stuck high on the cliff. It would be difficult to claim that Dave was somehow also necessary, because if he had not picked the gem up, Mike surely would have. Judging ownership in this way often leads first possessors to be identified as owners (because first possessors are typically necessary for possession), without reliance on a simple first possession rule.

Reconstructing history. To set the stage for the explanation we favor regarding why people choose the first possessor when trying to discover who owns an already-owned object, it is helpful to consider some examples of everyday ownership judgments.

Suppose you run into your friend Susan, and she is holding a beautiful edition of your favorite book. You will probably assume the book belongs to Susan. Assuming ownership in such situations is *crucial*. If you did not assume that Susan owns the book then you would have the same attitude towards it as you do toward the magazine on the empty subway seat, and you might seriously wonder whether it is owned at all, and by whom. If Susan set the book down and a stranger tried to take it, you would have little reason to stop the stranger or mention that it belongs to Susan. And problems would arise if Susan decided to give you the book as a gift, or if you wanted to buy it from her—if Susan were not the owner then you could not acquire ownership of the book from her.ⁱⁱⁱ If people seriously doubted that such possession signals ownership, then ownership could not function because it would constantly be called into doubt.

Susan's possession of the book suggests that she *earlier* obtained it through some legitimate means of acquiring ownership (e.g., she bought it, or received it as a gift). Hence, the conclusion that she owns it would be overturned if you discover that she did not obtain the book in a legitimate way—if, for instance, she had stolen it from a store. You might also overturn your conclusion that she owns the book if you saw her find it on a park bench. Here you would likely judge that the book was already owned when Susan found it, and still has the same owner now. It probably belongs to the person who forgot it on the bench—the person who possessed the book in the past. That is, you assume that that person, who previously possessed the object, owns it, and earlier legitimately acquired ownership of it.

These examples suggest that in trying to discover who owns an already-owned object, people typically assume that a person who possesses the object owns it, and that this person acquired ownership legitimately at some earlier time. However, this assumption is called into question when it is doubtful that the possessor earlier acquired the object in a way that legitimately transfers or establishes ownership. When this assumption is called into question,

the next best guess is that the owner is whichever person possessed it still earlier—perhaps that prior possessor earlier acquired ownership legitimately.

In this account, reasoning about ownership involves reconstructing history. Current possession of an object is used to infer ownership because it supports the assumption that the possessor had the object in the past, and likely legitimately acquired ownership at an earlier time. When this assumption about the possessor is cast into doubt, an earlier possessor (even if this person's identity is unknown) is assumed to be the true owner.

This “reconstructing” history account explains why people choose the first possessor when inferring ownership in scenarios where one character begins with a toy and plays with it, and then another character plays with it. Suppose a girl plays with a ball, and then a boy plays with it. Although both children possess the ball in the scenario, the boy's possession of the ball does not suggest that he possessed the ball before the scenario began, and earlier acquired it in a way legitimately conferring ownership. There is no mention of ownership being transferred or acquired in the scenario, and the girl possessed the ball before he did. In contrast, the girl's possession of the ball is consistent with her having earlier obtained possession of the ball in a manner legitimately conferring ownership (at least there is no reason to doubt this). The girl starts with the ball, implying that she possessed it before the scenario began, and that she may have earlier acquired it in a way that legitimately establishes ownership. First possession often provides hints about history; subsequent possession does not.

According to the “reconstructing history” account, the girl is chosen as the owner because her first possession of the ball is informative about the past, or at least indicates that she possessed the ball in the past, and hence can be assumed to have earlier acquired ownership of it legitimately. However, there are circumstances where first possession is not informative in this way. A unique prediction of this “reconstructing history” account is that people should be less likely to infer ownership from first possession in such situations. Suppose the ball is first seen between the two children, and then the girl and boy each play

with it in turn. Although the girl is again the first possessor, it is impossible to infer whether she possessed it before the scenario began (much as seeing Susan find the book does not allow you to infer that she had ever possessed it before). Because first possession is uninformative about prior possession here, it should not be used to infer ownership.

Findings from preschoolers and from adults support this prediction (Friedman & Neary, in preparation). As noted above, children and adults mostly choose the first possessor as owner in scenarios where one character begins with a toy and plays with it, and then another character plays with it. However, the first possessor is only chosen at chance-levels in scenarios that only differ in one detail—rather than beginning with the first possessor, the toy starts between the characters, before the characters each play with it. These findings are predicted by the “reconstructing history” account, but conflict with the view that children attribute ownership by applying a general “first possessor = ownership” rule. If children applied such a rule, they would choose the character who first possesses the ball, regardless of whether the ball begins with this character or begins between the characters.

Summary

We have outlined accounts of how people judge whether an object is owned, and if so by whom. The basic claim of our account is that when object history is unknown, reasoning operates to reconstruct this history. This method of making ownership judgments is warranted because the facts of whether a particular object is owned, and by who, typically depend on the history of the object in relation to people.

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**Appendix 7.2: Children and Adults use Gender-and Age-Stereotypes in
Ownership Judgments.**

Paper accepted in Journal of Cognition and Development

Children and Adults Use Gender- and Age-Stereotypes in Ownership Judgments

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Abstract

In everyday life we are often faced with the problem of judging who owns an object. The current experiments show that children and adults base ownership judgments on group stereotypes, which relate kinds of people to kinds of objects. Moreover, the experiments show that reliance on stereotypes can override another means by which people make ownership judgments—inferring ownership from first possession. Experiment 1 replicates previous findings in showing that children and adults are strongly biased to assume that the first person to possess an object is its owner, while also demonstrating that the first possession bias shows specificity to ownership. Experiment 2 shows that preschoolers and adults used gender stereotypes to make ownership judgments, and do this even when stereotypes conflict with first possession. Experiment 3 reports similar findings but with age stereotypes. These findings reveal that stereotypes are a powerful means for making ownership judgments.

Ownership of property matters for children. Ownership influences children's thoughts and feelings about objects—children typically prefer their property over similar non-owned objects (e.g., Irwin & Gebhard, 1946; Gelman, Manczak, & Noles, in press). And it influences children's behavior, including their behavior in relation to objects, and their social behavior. Children often attempt to control their own property (Eisenberg, Haake, & Bartlett, 1981), they recognize that others have right over their property (Kim & Kalish, 2009; Neary, Friedman, & Burnstein, 2009), and they spontaneously protest when someone disregards their ownership rights or those of another person (Rossano, Rakoczy, & Tomasello, 2011). As such, acquiring an appreciation of ownership is a crucial part of children's social cognitive development.

For children to heed other people's ownership rights, they need to be able to judge to whom objects belong. Children aged two can identify the owners of objects with which they are familiar (e.g. mother's toothbrush or their own) (Fasig, 2000).

Children aged two and older judge that the first person to possess an object is its owner (Friedman & Neary, 2008). Children aged three and older recognize when ownership is transferred, at least when transfers occur in the context of a birthday gift exchange; outside this context, even older children may have difficulty recognizing when ownership is transferred (Blake & Harris, 2009; Friedman & Neary, 2008; also see Noles & Keil, 2011). Young children may also believe that ownership is transferred when a person creatively modifies it (Kanngiesser, Gjersoe, & Hood, 2010). From age three-and-a-half, children judge that the person who decides whether others may use an object is its owner (Neary et al., 2009). And by age six, children appear to apply some of these methods in making judgments about the

ownership of ideas and intellectual property (Shaw, Li, & Olson, in press; also see Olson & Shaw, 2011).

Previous studies examining how children judge who owns an object have one thing in common: To judge ownership, children had to rely on information relating particular individuals to particular objects. However, information about *kinds* of people and objects may also be useful for judging who owns what. Different groups typically use and prefer different kinds of objects. For instance, girls are more likely than boys to play with dolls, and adults are more likely than children to use car keys. Groups might also differ in the objects they typically own. It is plausible that children might consider information about kinds and groups in judging who owns an object. First, young children appear to consider an objects' kind in judging *whether* it is owned (Neary, Van de Vondervoort, & Friedman, 2012)—they view natural objects as less likely to be owned than objects that are human-made. Second, young children are aware of group differences in object preference and use. They prefer an unfamiliar object endorsed by someone from their own gender- or age-group, over an object endorsed by someone of the opposite gender, or in a different age group (Shutts, Banaji, & Spelke, 2010; also see Martin, Eisenbud, & Rose, 1995). They also know that certain toys are more typically preferred by boys, and that others are more typically preferred by girls (e.g., Eisenberg, Murray & Hite, 1982; Kuhn, Nash, Brucken, 1978; Martin & Little, 1990; Banse, Gawronski, Rebetez, Gutt, & Morton, 2010); awareness of gender-object associations are even apparent in infants aged 10 months (Levy & Haaf, 1994). Hence, children might likewise expect different kinds of people (e.g. boys and girls; adults and children) to *own* different kinds of things. If so then children might use group stereotypes when judging who owns an object. They might judge that a doll is more likely owned by a girl than a boy, or that car keys

are more likely owned by an adult than a child. Previous studies have not explicitly tested whether children (and adults) base ownership judgments on group stereotypes. However, participants did not rely on stereotypes in previous experiments showing that first possession is used to infer ownership (Friedman, 2008; Friedman & Neary, 2008). In these experiments, participants saw scenarios in which a boy and a girl each had a turn playing with a toy—either a ball or a teddy bear. Rather than responding according to gender stereotypes (ball belongs to boy, teddy bear belongs to girl), children and adults instead judged that each toy belonged to the character who possessed it first. However, these studies might have found no effect of gender stereotypes because the objects used—a ball and teddy bear—are only weakly gender-typical (Campenni, 1999). Findings might differ with strongly stereotyped objects.

The current experiments examine whether children and adults base ownership judgments on group stereotypes. A straightforward way to investigate this would be to ask participants to judge who owns a highly stereotyped object (e.g., a doll). However, this approach is weak because participants could base responses on stereotypes, without actually thinking about ownership. For example, they might reason “I don’t really know the answer, but girls *like* dolls, so I’ll choose the girl”. To guard against this possibility, the current experiments included conditions pitting stereotypes against first possession. With information about first possession provided, participants had a viable source of information for making ownership judgments, and were not *forced* to respond based on associative reasoning (e.g., girls like dolls). Such conditions can also rule out the possibility that children only use stereotypes when they have no other information. Because of the importance of the first possession bias for our experiments, in Experiment 1 we sought to replicate the first possession bias. This experiment also tested whether the first possession

bias has *specificity* for ownership by examining whether children's and adults' judgments about who owns an object differ from their judgments about who likes it. The subsequent experiments examined whether group stereotypes are used to infer ownership, and whether they are powerful enough to override the first possession bias. Experiment 2 examined use of gender stereotypes, and Experiment 3 examined age stereotypes.

EXPERIMENT 1

Method

Participants

Seventeen children (mean = 3;6 years; range 3;1 to 4;2 years; 8 male, 9 female) and 20 adults (mean = 21 years, range = 18 to 26 years; 8 male, 12 female) participated. All participants took part in two conditions; an ownership condition and a liking condition. In this experiment and those subsequent, children were recruited from primary schools in the North East of England serving predominantly white, middle-class backgrounds; adults were recruited from Northumbria University, and were predominantly white and middle class.

Materials And Procedure

Participants saw four stories, two stories in the 'ownership' condition and two stories in the 'liking' condition. Each story was about a boy, a girl, and different familiar artifacts: a beach ball, a book, a drinking cup, and a telephone. Each story depicted different characters playing with the objects. The stories were told to children, and read by adult participants. Stories were shown using three-page booklets. In each booklet, the first page showed one character holding the object. Accompanying text

explained that the character is playing with the object (e.g. “Samantha is playing with the beach ball.”) The second page showed the other character holding the object, and this character was also described as playing with the object. The final page showed both characters standing on either side of the object (whether the boy or girl was to the left in all four booklets was counterbalanced across participants). As this page was displayed, children were asked either “Whose is the [object name]?” or “Who likes the [object name]?” Adults read the questions on a separate answer sheet, and responded to them by checking either of the two characters’ names. Half the participants received two stories in the ownership condition followed by two in the liking condition, and the other half received the stories in the reverse order.

It was expected that children and adults would base judgments of ownership on first possession, consistent with previous demonstrations of the first possession bias. A first possession bias was not expected when participants judged which character likes the object.

Results And Discussion

Participants were scored 1 each time they chose the character who first possessed the object in each story, and 0 each time they chose the second possessor (maximum score per condition is 2). An initial analysis of variance (ANOVA) was conducted including participants’ gender as a factor. There were no effects of gender, except a three-way interaction between age, condition, and gender ($F(1,33) = 6.78, p < .014$). Examination of this interaction did not yield informative findings, and because it was the only gender effect to emerge among all studies reported in this paper, we believe it to be a spurious finding. Hence, we ran the main analysis without including gender as a factor.

A 2 (condition: ownership, liking) X 2 (age: children, adults) ANOVA found no main effect of age ($F(1,35) = .41; p = .71$, ns; all tests two-tailed), and no age x condition interaction ($F(1,35) = .005, p = .94$, ns). There was a main effect of condition ($F(1, 35) = 25.18; p < .01$), as participants were more likely to choose the first possessor in the ownership than liking condition; this difference also emerged when examining children and adults separately (both $ps < .01$). Participants' scores exceeded the chance score of 1 when judging ownership ($t(36) = 11.42, p < .01$, but not when judging liking ($t(36) = -.22, p = .83$, ns); the same patterns are again observed if responses from each age group are examined separately ($p < .01$ in ownership condition, $p > .75$ in liking condition). In other words, children and adults chose the first possessor when judging who owns an object, but not when judging who likes it. These findings replicate previous results in demonstrating that children and adults show a strong bias to base ownership judgments on first possession. Importantly, the findings also reveal that children and adults do not base liking judgments on first possession. Hence, young children's ownership judgments are different from their liking judgments.

We next examined whether children also base ownership judgments on group stereotypes, and whether reliance on these stereotypes might be powerful enough to override the first possession bias. Participants saw scenarios in which two characters each possessed an object in turn. Gender stereotypes could be used to infer which character owned the object, but scenarios varied in whether this character possessed the object first ("congruent" conditions) or second ("incongruent" conditions).

EXPERIMENT 2

Method

Participants

Thirty children and 40 adults participated. Within each age group, participants were randomly assigned to one of two conditions. In the congruent condition there were 15 children (mean = 3;5 years; range 3;0 to 4;0 years; 6 male, 9 female) and 20 adults (mean = 21 years; range = 18 to 42 years; 4 male, 16 female); in the incongruent condition there were 15 children (mean = 3;7 years; range = 3;0 to 4;2 years; 6 male, 9 female) and 20 adults (mean = 26 years; range = 18 to 60 years; 5 male, 15 female).

Materials And Procedure

Participants saw four stories. Each story was about a boy, a girl, and different familiar artifacts: a toy truck, a jewellery box, football equipment, and a doll (with this order used, or its reverse). Each story depicted different characters playing with the objects. These four artifacts are gender typed: Trucks and football equipment are viewed as masculine; jewellery boxes and dolls are viewed as feminine (Campenni, 1999). The stories were told to children, and read by adult participants. Stories were shown using three-page booklets. In each booklet, the first page showed one character holding the object. Accompanying text explained that the character is playing with the object and enjoys doing so (e.g. "Rachel is playing with the truck. Rachel likes playing with the truck.") The second page showed the other character holding the object, and this character was also described as playing with

the object and enjoying this. The final page showed both characters standing on either side of the object (whether the boy or girl was to the left in all four booklets was counterbalanced across participants). As this page was displayed, children were asked “Whose is the [object name]?” Adults read this question on a separate answer sheet, and responded to it by checking either of the two characters’ names. In the congruent condition, the artifact in each story was possessed first by the character consistent with gender stereotypes, and then by the character inconsistent with gender stereotypes (e.g. doll possessed first by girl, then by boy). The reverse was true in the incongruent condition. If children use stereotype information to judge ownership and weigh this information strongly then they should judge masculine toys as owned by the boy and feminine toys as owned by the girl, both when gender stereotypes are consistent with first possession and when they are in conflict.

Results And Discussion

Participants were scored 1 for each selection consistent with the gender stereotype of the object and 0 for each selection inconsistent with gender stereotypes (maximum score 4). Two adults, both from the incongruent condition, gave other responses (“I don’t know”, “Either”) and were therefore excluded from analysis. An initial ANOVA was conducted including participants’ gender as a factor; however there was no main effect of gender, nor did it enter into any interactions; hence, all subsequent analyses did not include gender as a factor. A 2 (age: children, adults) X 2 (condition: congruent, incongruent) ANOVA revealed that adults were more likely to make ownership decisions in line with gender stereotypes than were children ($F(1, 64) = 14.64; p < .01$). Also, responses based on gender stereotypes

were more common in the congruent than incongruent condition ($F(1, 64) = 9.64; p < .01$). There was no age x condition interaction ($F(1, 64) = 2.76, p = 1.02, ns$).

As can be seen in Figure 2, children chose in accord with gender stereotypes at rates exceeding the chance score of 2 in both conditions (congruent, $t(14) = 10.46; p < .01$; incongruent conditions, $t(14) = 3.29, p < .01$), though their choices were more in line with gender stereotypes in the congruent condition than incongruent condition, ($t(28) = 2.25, p = .03$). Adults also chose in accord with gender stereotypes, at rates exceeding chance, in both conditions (congruent, 100% of responses; incongruent, $t(17) = 17.63; p < .01$). As with children, adults' choices were more in line with gender stereotypes in the congruent condition than incongruent condition ($t(36) = 2.33, p = .03$).

We further examined the data to investigate why children and adults showed an effect of condition, giving more responses in line with gender stereotypes in the congruent condition than in the incongruent condition. To increase power, and because the effect was shown by children and adults alike, these analyses collapsed across age. Exploration of the data suggested that the lower scores in the incongruent condition did not result from a sub-group of participants who always (or almost always) relied on first possession over stereotypes. Only one participant predominantly relied on first possession—this was a child, who based responses on first possession in three of the four trials. Instead, the effect of condition appears to have resulted because the “masculine” items (toy truck; football equipment) were weakly stereotyped, relative to the feminine items (jewellery box; doll). This conclusion was suggested by the observation that in the incongruent condition (where scores could not be boosted to near ceiling by the first possession bias), scores for feminine items tended to be higher than scores for masculine items ($t(32) = 1.966, p = .06$), and more participants had higher scores for feminine than

masculine items than the reverse (MacNemar sign test, $N = 12$, $k = 2$, $p = .04$).

Moreover, although there was an effect of condition when examining scores for masculine items alone ($t(66)=2.47$, $p = .02$), there was no such effect when examining scores for feminine items alone ($t(66)=1.63$, $p > .10$).

In sum, these results demonstrate that both children and adults use gender stereotypes when making ownership judgments and that reliance on stereotypes can override the first possession bias. The findings also suggest that for the most strongly stereotyped items (i.e. the feminine ones), responses are based on gender stereotypes equally regardless of whether these are aligned with, or pitted against, first possession; however, first possession is sometimes used for less strongly stereotyped items (i.e. the masculine ones), leading to an effect of condition. A third experiment examined whether ownership judgments of children and adults are also guided by stereotypes about age.

EXPERIMENT 3

Method

Participants

Thirty children and 40 adults participated. Within each age group, participants were randomly assigned to one of two conditions. In the congruent condition there were 15 children (mean = 3;7 years; range = 3;0 to 4;10 years; 6 male, 9 female) and 20 adults (mean = 22.4 years; range = 18 to 56 years; 4 male, 16 female). In the incongruent condition there were 15 children (mean = 3;87 years; range 3;0 to 4;11 years; 9 male, 6 female) and 20 adults (mean = 28 years; range = 18 to 58 years; 6 male, 14 female).

Materials And Procedure

This experiment used the same methods and design as Experiment 2, with participants again seeing four stories presented in three-page booklets. However, rather than featuring two children and gender-typed artifacts, the stories were instead about an adult man, a boy, and four age-typed artifacts: some building blocks, a laptop, a toy helicopter, a car key (with this order used, or its reverse). Of these artifacts, building blocks and toy helicopters are typically for children, while laptops and car keys are typically for adults. As in Experiment 2, in each story one character was first shown with an artifact, then the other character was shown with it, and finally both characters appeared with the artifact between them, and children were asked to whom it belongs. While the accompanying text in Experiment 2 did not specifically mention the gender of each character, the text in this experiment did mention the ages of the characters (e.g., “Rob is 6 years old. He is using the car keys to open the door.”) This information was provided because piloting revealed that some children had difficulty recognizing which character was the adult and which was the child; parallel difficulties for differentiating the genders of the characters did not arise in Experiment 2. In the congruent condition, the artifact in each story was possessed first by the character consistent with age stereotypes, and then by the character inconsistent with age stereotypes (e.g. a car key possessed first by the man, then by the boy). The reverse was true in the incongruent condition. It was expected that children would judge the adult objects as owned by the man and the children’s objects as owned by the boy, regardless of whether age stereotypes were consistent or inconsistent with first possession.

Results And Discussion

Participants were scored 1 for each selection consistent with the age stereotype of the object and 0 for each selection inconsistent with age stereotypes (maximum score 4). One adult, from the incongruent condition, responded “I don’t know” and was therefore excluded from analysis. An initial ANOVA was conducted including participants’ gender as a factor; however there was no main effect of gender, nor did it enter into any interactions; hence, all subsequent analyses did not include gender as a factor. A 2 (age: children, adults) X 2 (condition: congruent, incongruent) ANOVA revealed results generally similar to those in Experiment 2. Adults were again more likely to make ownership decisions in line with stereotypes compared to children ($F(1, 65) = 17.55; p < .01$). However, unlike Experiment 2, there was no main effect of condition, ($F(1, 65) = 0.835; p = .36, ns$), nor an age x condition interaction ($F(1, 65) = 0.92, p = .34, ns$). As can be seen in Figure 2, children’s ownership judgments were in accord with age stereotypes at rates exceeding the chance score of 2 in both conditions (congruent, $t(14) = 2.96, p = .01$; incongruent, $t(14) = 6.97, p < .01$), and did not differ between by condition ($t(28) = -.92, p = .37, ns$). Adults likewise judged ownership according to age stereotypes at rates exceeding chance in both conditions (congruent, $t(19) = 16.91, p < .01$; incongruent, $t(18) = 21.43, p < .01$), and their responses also did not differ across conditions ($t(37) = 0.06, p = .96, ns$). As in Experiment 2, children and adults alike relied on stereotypes when inferring who owns an object, though in this experiment the stereotypes concerned age. Reliance on these stereotypes was again strong enough to lead participants to override the first possession bias. However, in contrast to Experiment 2, we observed no difference in responses between congruent and incongruent trials. As noted above, the difference across conditions in Experiment 2 was driven by

responses to the masculine items. Hence, these items were probably more weakly stereotyped than the feminine items, and more likely to allow some participants to base responses on first possession in the incongruent condition. On this account, the absence of an effect of condition in Experiment 3 probably resulted because all the items were *strongly* stereotyped. This explanation fits well with the adult findings, because as Figure 2 shows they overwhelmingly based responses on age stereotypes. This explanation is a bit more tenuous for children, though, because their scores (though exceeding chance rates) were not particularly high, and so it might be expected that if children in the incongruent condition did not base responses on stereotypes, then perhaps they should have relied on first possession instead. But it is important to consider that stereotypes and first possession are not the only factors that can influence children's judgments—some children might have been tired and inattentive, and may have responded at random or based on irrelevant considerations. So “noise” is likely to contribute to children's scores.

GENERAL DISCUSSION

We investigated whether children and adults rely on group stereotypes when judging who owns an object. Experiment 1 replicated previous findings in showing that preschoolers and adults base ownership judgments on first possession, and also demonstrated that the first possession bias has specificity for ownership—children and adults were biased to choose the first possessor when judging who owns an object, but not when judging who likes it. Experiments 2 and 3 showed that children also base ownership judgments on gender and age stereotypes, and that reliance on stereotypes can override the first possession bias. While many previous studies have examined children's gender stereotypes about object preferences, the current

experiments are the first to examine how these stereotypes are used in ownership judgments. Moreover, Experiment 3 is one of the few studies to examine children's stereotypes about different age groups.

The fact that children and adults favoured group stereotypes over first possession suggests that group stereotypes can strongly influence ownership judgments.

Stereotypes do not merely influence judgments in the absence of other information.

On the contrary, stereotypes are heeded so strongly that at least one other method of inferring ownership can be overridden. A further indication that group stereotypes are strongly heeded in ownership judgments is that use of stereotypes was completely *spontaneous* in Experiment 2. In that experiment, the gender of each character was not mentioned explicitly; characters were only referred to by their names, and the accompanying text did not include statements such as "this is a girl". Moreover, group stereotypes were not pointed out to children. Hence, it appears that children and adults are inclined to base ownership judgments on group stereotypes, and require no prompting. Experiment 3 is less convincing in this regard, because children were told that one character is an adult and the other a child. However, this is not to suggest that children (or adults) will favour group stereotypes over *all* (or even most) other methods of judging ownership. For instance, people might judge that a doll belongs to a boy, and not to a girl, if informed that the boy received the doll as a birthday gift.

CHOOSING BETWEEN STEREOTYPES AND FIRST POSSESSION

Children's reliance on group stereotypes over first possession might appear to contrast with findings from earlier experiments in which participants based ownership inferences on first possession in judging whether a boy or a girl owns a ball and a

teddy bear (Friedman, 2008; Friedman & Neary, 2008). However, a straightforward explanation for this difference (and one motivating the current experiments) is that the previous experiments used weakly stereotyped objects, whereas the current experiments used more strongly stereotyped ones. The present findings raise the question of how children choose between information about first possession and strong stereotypes when these conflict. One possibility is that the two kinds of information compete, such that children are conflicted in whether to base judgments on first possession or stereotypes. On this view, we should expect a cost when stereotypes are pitted against first possession—fewer children should base responses on stereotypes when these are pitted against first possession than otherwise. Alternatively, instead of competing first possession with gender stereotypes, children might simply disregard first possession when given compelling evidence that someone other than the first possessor is the owner; the first possession bias might only be triggered in the absence of strong evidence regarding ownership (Friedman & Neary, 2008, p. 12). This “no competition” account predicts that responses based on strong stereotypes should not decline when these are pitted against first possession. Overall, the current findings support this “no competition” account. As predicted by that account, there was no difference between responses in the congruent and incongruent conditions of Experiment 3. And although such a difference occurred in Experiment 2, it only resulted because the masculine items were more weakly gender-typed than the feminine items. So perhaps some participants based responses on first possession for those items because they did not even recognize that inferences could be based on gender stereotypes. However, this conclusion should only be viewed as tentative, because the current experiments are not well suited for testing between these accounts of how people choose between stereotypes and first possession. One major

shortcoming, for this purpose, is that Experiments 2 and 3 did not include baseline conditions (i.e., which gauge children's reliance on stereotypes when these are neither supported, nor pitted against, stereotypes; or which gauge children's use of first possession when it is not pitted against strong stereotypes). This "no competition" account might appear to contradict previous experiments showing that 3- and 4-year-olds sometimes wrongly claim that a gift belongs its giver (i.e., first possessor) rather than its recipient (Blake & Harris, 2009; Friedman & Neary, 2008). But this is only if one assumes that children's difficulty in those experiments resulted because they failed to disregard the first possession bias, as might be expected if the bias competes with conflicting information (e.g., that an object is a gift; information about stereotypes). Our findings support alternative interpretations of these previous findings. Children may have had difficulty recognizing that the objects had been given as a gift (Blake & Harris, 2009, p. 141; Friedman & Neary, 2008, pp. 845-846). Although these conclusions are not decisive, they do highlight that further work on children's appreciation of transfer could be used to further test between the "competition" and no "competition accounts". Regardless of how children choose between first possession and stereotypes, these two kinds of information will rarely conflict in daily life—the first person observed with an object will not usually be a member of a group that is very unlikely to own an object of its kind. Rather than conflicting, the two kinds of information might typically be used in different situations, and for somewhat different purposes. First possession will probably be used when information about possession is available, and can be used to pinpoint a specific individual as the most plausible owner of an object. Stereotypes may be used in the absence of such information. For example, if you find a lost doll on the ground outside, you will know that it probably belongs to a girl, and perhaps one of the girls you see playing nearby. Hence, group stereotypes may be most useful in narrowing

down plausible owners of an object to a limited set of people, who are members of the group most likely to own objects of its kind.

INFERRING OWNERSHIP FROM STEREOTYPES

Although the findings show that group stereotypes are used in ownership judgments, *how* stereotypes are used is an open question. One possibility is that stereotypes include information about ownership. For instance, participants might believe that girls typically own dolls (and that boys do not), allowing them to directly infer that the doll probably belonged to the girl (e.g., “Girls typically own dolls, so this doll probably belongs to the girl.”) Alternatively, stereotypes might instead only specify that some kinds of people are more likely than others to prefer, to use, or to be associated with, certain kinds of objects. This ability to associate gender-stereotyped objects (toys) with males or females appears to have developed by 18 months of age (Serbin, Poulin-Dubois, Colburne, Sen, & Eichstedt). From such stereotypes people might make best guesses about ownership. For instance, participants might have reasoned that the girl probably owned the doll because girls typically like dolls more than boys do. Note, though, that this account does not imply that ownership judgments merely *are* judgments about liking. In fact, Experiment 1 shows that ownership and liking judgments differ because first possession was used for ownership judgment only. Future research could test between these various accounts of how children reasoned (i.e. in terms of ownership, liking, or association). For example, children could be asked about objects that are typically liked by some group (and associated with that group), but which are rarely owned by members of the group. For example, children like playgrounds more than do adults, even though adults are more likely to own a playground. Regardless, use of group stereotypes contrasts with all other known

methods by which children judge who owns an object. All other known methods require children to consider people and objects in terms of their *individual* characteristics. For instance, children may judge that *this* toy belongs to *this* boy because he happened to possess it first. However, if children had only heeded such information in the current experiments, then they should always have chosen the first possession, rather than responding in accord with stereotypes. Instead, children likely based their judgments on expectations about *kinds* of people and objects. Sticking with the jewelry box example, children might have judged that it probably belongs to the girl because jewelry boxes (a kind of object) are likely to be owned, or liked, by girls (a kind of person). Children could also have based judgments on recollections of which of their acquaintances happens to own a jewelry box. For example, children could reason, “My friend Sarah has a jewelry box, so this one probably belongs to the girl”. This recollection-based judgment might appear to center on individuals (i.e., Sarah, and her particular jewelry box). However, it is also kind-based: children consider the object’s kind in deciding to reflect on other jewelry boxes; and they consider what kind of person Sarah is when concluding that the jewelry box probably belongs to a girl. Although, the current findings are the first to show kind-based reasoning in children’s judgments about *who* owns an object, such reasoning is likely used when children judge *whether* an object is owned—children view human-made objects as more likely to be owned than natural objects, and this reasoning may be based on inferences about object kind (Neary et al., 2012).

CONTINUITY IN SOCIAL COGNITION

One striking aspect of the current findings is the similarity between children’s and adults’ responses. Although adults’ sometimes scored higher than children, both

groups showed the same response patterns across all experiments. This continuity between children and adults is typical of recent research on ownership. This research has revealed few major differences between young children and adults, and most reported differences (e.g., Kim & Kalish, 2009) have been a matter of degree (i.e., rather than qualitative differences). As such, the development of ownership may differ from development in many other domains, where obvious developmental discontinuities have been found. Consider another domain of social cognition, research on “theory of mind” (i.e., people’s reasoning about mental states). From its beginnings (Wimmer & Perner, 1983), research on theory of mind found that young children’s judgments differ markedly from those of older children and adults (see Flavell, 1999 for a good overview). Many theorists have claimed that these age-related differences arise because young children have different concepts and theories of mental states than do adults, and because development in theory of mind proceeds via conceptual revolutions, akin to those in the history of science (e.g., Gopnik & Wellman, 1992; Perner, 1991; but see Leslie, 2000 for an alternative view of development in theory of mind). The developmental continuity observed in the current experiment, and in other recent research, suggests that such conceptual revolutions may not occur in the development of people’s appreciation of ownership—children’s concept of ownership may be continuous with that of adults. At a minimum, the findings provide evidence for remarkable developmental continuity in at least one area of social cognition.

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Figure 1. Experiment 1. Mean number of times that children and adults judged objects were owned or liked by the first possessor.

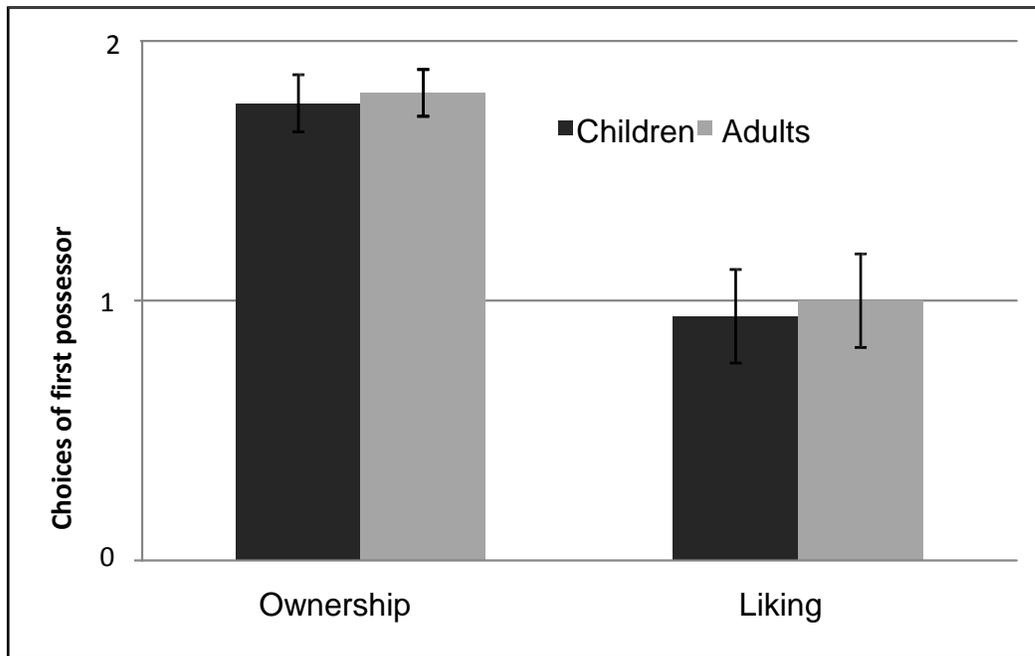
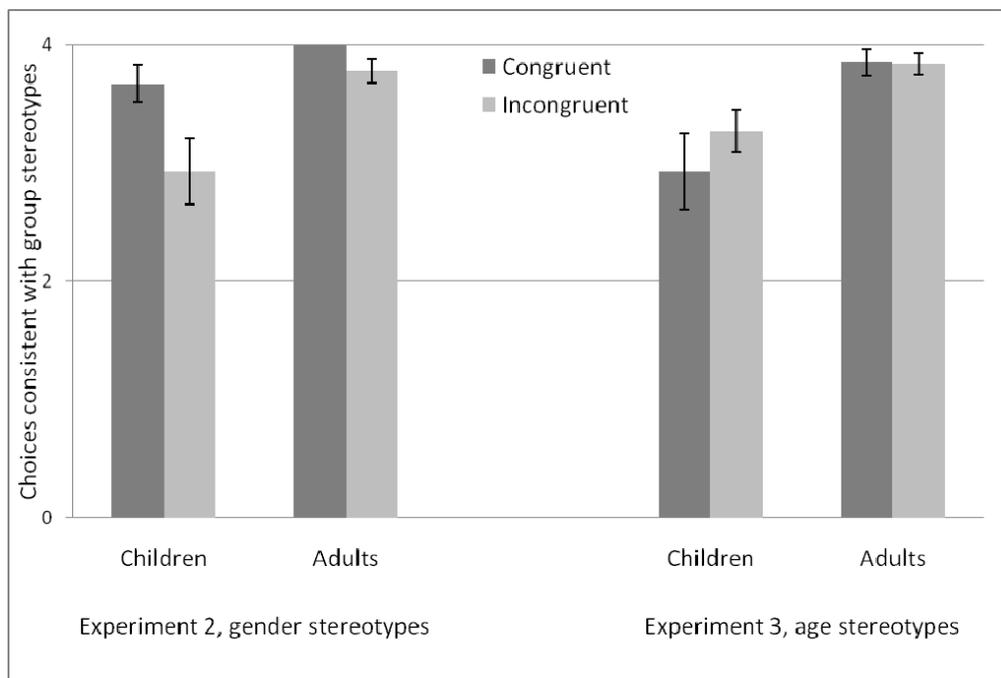


Figure 2. Experiments 2 & 3. Mean number of times that ownership judgments were consistent with group stereotypes.



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