Children use ownership to understand actions and preferences

by

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Author's Declaration

This thesis consists of material all of which I authored or co-authored: see Statement of Contributions included in the thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Statement of Contributions

I am either the majority contributor or sole contributor to all of the work presented in this thesis. This includes chapters of my thesis which are publications co-authored with my supervisor Dr. Ori Friedman, and collaborator Patricia Kanngiesser. Citations and information regarding these publications can be found in the relevant chapters.

Abstract

Actions are often dictated by an individual's desires. While this may be appropriate in many situations, there are important exceptions, such as when an individual desires someone else's property. Across three papers, this dissertation shows that children consider ownership when deciding how they and others will act, and when inferring people's preferences for objects. Chapter 2 examined whether young children understand and respect the ownership rights of others when allocating resources to themselves and another agent. When selecting resources for themselves, 2-and 3-year-olds generally took their own resources and avoided those that belonged to the other agent. As such, children use ownership to guide their own actions, and uphold ownership despite a preference to self-maximize. Chapter 3 investigated how children predict people will act when someone else's property is preferred, and whether ownership influences which objects children believe people prefer. Four-year-olds, but not 3-year-olds, predicted that people would respect ownership, and 5-year-olds predicted people would respect ownership despite preferring someone else's property. Ownership also influenced children's inferences about which objects people prefer, as ownership reduced the likelihood that children expect people to prefer objectively attractive objects; however, children were no more influenced by information that the agent owns the object than by information that someone connected with the agent owns it. Chapter 4 examined how children use ownership and object history to infer which objects people prefer. Children age 4-7 were sensitive to object histories that were distinctive and connected the owner to the object—children believed that objects from interesting locations and were acquired in interesting ways were special to owners, but did not believe that original acquisitions were special. Further, distinctive object histories influenced children's judgments of which common objects (e.g., keychains) are special to an owner but did not

influence their judgments of which stuffed animals are special, suggesting that children's use of distinctive object histories to determine which objects are special depends on the type of object. Together this dissertation reveals that children understand that ownership limits their own and others' ability to act on their preferences, and consider ownership when inferring which objects are preferred.

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Table of Contents

List of Figures

List of Tables

Chapter One: General Introduction

Preferences and actions are often intertwined—despite occasionally performing undesired actions (e.g., paying bills), people's actions are typically guided by their preferences. For instance, we think about a desired meal when deciding which restaurant to go to for dinner. However, acting on our preferences is not always possible. Sometimes, actions are constrained. Such constraints can be environmental, physical, and monetary (e.g., Chernyak, Kushnir, Sullivan, & Wang, 2013; Kushnir, Gopnik, Chernyak, Seiver, Wellman, 2015; Schult & Wellman, 1997). For instance, we cannot eat at a preferred restaurant if it is closed, if we are unable to get there, or if we cannot afford it (assuming we are not willing to dine-and-dash). Understanding these constraints, therefore, helps us identify when our actions will align with our preferences and allows us to predict whether other people will (or at least attempt to) act according to their preferences.

This dissertation investigates one factor that often limits people's ability to act on their preferences—ownership. People cannot freely interact with objects they do not own because doing so conflicts with owners' property rights. Owners have the right to use and modify their property, decide who can interact with their property, and can transfer their ownership of objects to other people. Non-owners, however, do not have these rights (Balganesh, 2008; Boyer, 2015; Cohen, 1954; Merrill, 1998; Snare, 1972). Importantly, this means that it is typically unacceptable for people to use or take another person's property without permission, even if this property is desirable. For instance, it is unacceptable to eat an appetizing dinner belonging to another restaurant guest, even if we strongly desire that meal. Overall, an understanding of ownership and the limitations imposed by others' ownership rights is necessary to appropriately interact with objects in our environment.

Understanding the constraints imposed by ownership, though, may be especially difficult compared with other types of constraints. First, ownership is unobservable and nonobvious (e.g., Gelman, Manczak, & Noles, 2012; Nancekivell, Friedman, & Gelman, 2019). It is impossible to know whether an object is owned by simply looking at it. Because ownership cannot be observed and has to be inferred, understanding the limiting role ownership has on people's actions may be more difficult than understanding other types of constraints, in particular physical ones. For instance, it might be more difficult to understand that a person is constrained from taking an available necklace because it belongs to someone else than it is to understand that a person is constrained from taking a necklace because it is in a locked case. Second, ownership differs from most constraints in that it conveys the *acceptability*, rather than the *possibility*, of actions with objects (e.g., Nancekivell & Friedman, 2017; Van de Vondervoort, Meinz, Friedman, 2017). For instance, although it would not be impossible to take someone's dinner, it would be unacceptable to do so (but see Phillips & Cushman, 2017 for findings showing that adults sometimes view immoral acts as impossible).

Given that successful social functioning involves an understanding of ownership and its implications, it is important to examine how and when this understanding develops within the lifespan. From previous work, we know that by age 2, children can identify who owns what (e.g., Brownell, Iesue, Nichols, & Svetlova, 2013; Fasig, 2000), and by age 3, children understand that owners are entitled to certain rights over their property (e.g., Riedl, Jensen, Call, & Tomasello, 2015; Schmidt, Rakoczy, & Tomasello, 2013). However, previous work left unclear how children reason about ownership in relation to preferences. For example, no research examined when children first understand that ownership constrains people's ability to act on their preferences. If young children believed that people (including themselves) could act on their

preferences for objects regardless of ownership, children might violate others' ownership rights and predict others would act in a similar manner. This, in turn, might cause young children to be overly defensive of their property, get into frequent arguments, and face legal repercussions at older ages (for a discussion see Boyer, 2015).

The current dissertation attempts to fill this gap in our knowledge by examining the development of children's understanding of ownership and how it interacts with preferences. The first half of this dissertation examines whether children understand that ownership constrains the ability to act on preferences. In particular, I examine whether children heed ownership when it conflicts with their desires, and whether children expect people to respect ownership when someone else's property is more desirable. The second half of this dissertation examines the influence of ownership on preferences and whether children use ownership to infer which objects people prefer. In the following sections, I review what is known about children's reasoning about ownership, and the factors children consider when predicting people's actions and inferring their preferences.

Children's understanding of ownership

Imagine a child is given pipe cleaners to make a craft but needs more to finish her artwork. The child notices more pipe cleaners nearby, but these pipe cleaners belong to an absent peer. The child is faced with a dilemma: Act on the desire to have more pipe cleaners and take the ones belonging to her peer or respect the ownership rights of the peer and refrain from taking the desired pipe cleaners. Such conflicts between desires and ownership are frequent. Given this, Chapter 2 examines whether children's understanding of ownership influences their actions, and more specifically, whether ownership prevents them from acting on their preferences.

For children to understand the constraints of ownership, they need to understand two concepts. First, children must understand that objects can belong to others. Previous research shows that between 18 and 30 months of age, toddlers begin to produce possessive nouns, such as “mine” and “yours” (Hay, 2006; Tomasello, 1998). At age 2, toddlers can identify objects that belong to them and to other people (Brownell et al., 2013; Fasig, 2000; Ross, Friedman, & Field, 2015; also see Saylor, Ganea, & Vàzquez, 2011). Toddlers can also infer the ownership of novel objects from verbal statements, such as “This is yours” (Gelman et al., 2012) and “That’s Sally’s ball” (Blake, Ganea, & Harris, 2012). They also use visual information when determining who owns an object. Toddlers typically believe that the owner of an object is the first person to possess it (Blake & Harris, 2009; Friedman & Neary, 2008; for findings with older children and children in other cultures see Kanngiesser, Rossano, & Tomasello, 2015 and Noles & Keil, 2019). For example, after seeing a boy play with a ball and then a girl play with the same ball, toddlers judge that it belongs to the boy (Friedman & Neary, 2008).

Second, children must understand that ownership confers a set of specific rights to owners. Some research suggests that toddlers are aware of their *own* ownership rights. They defend their property and assert their ownership rights in interactions with siblings and peers (Eisenberg-Berg, Haake, & Bartlett, 1981; Eisenberg-Berg, Haake, Hand, & Sadalla, 1979; Hay & Ross, 1982; Ross, 1996, 2013; Ross et al., 2015). They are more likely to attempt to physically control an object (e.g., hold it, cover it, take it back from someone) when it is described as belonging to them rather than belonging to a group of individuals, such as their class (Eisenberg-Berg et al., 1979). Toddlers also protest and intervene when someone violates their ownership rights (Kanngiesser & Hood, 2014; Rossano, Rakoczy, & Tomasello, 2011). For example, they protest when an agent takes their hat and attempts to throw it away (Rossano et al., 2011).

However, toddlers' understanding of ownership rights seems to be limited to their own rights as they do not react to transgressions involving other people's property (Kanngiesser & Hood, 2014; Rossano et al., 2011).

By age 3, children extend their understanding of ownership rights to include the rights of others. Three-year-olds protest and intervene in transgressions against other people's property (Riedl et al., 2015; Rossano et al., 2011), take stolen property away from thieves and return the items to the rightful owners (Riedl et al., 2015), and defend owners' entitlements to make decisions about their property, such as deciding who is allowed to use it (Schmidt et al., 2013). In some situations, 3-year-olds even prioritize ownership and uphold others' ownership rights more than adults. Children judge that an owner of an object should get to use their object over someone who needs it and is currently using it, whereas adults tend to side with the current user (Neary & Friedman, 2014).

In sum, we know that from age 2, children understand their own ownership rights and by age 3 understand the ownership rights of others. However, it is not known whether children understand the influence ownership has on their ability to fulfill their desires or act on their preferences. The experiments in Chapter 2 of my dissertation are the first to investigate whether young children uphold others' ownership rights and refrain from taking other people's property (but see Davoodi, Nelson, & Blake, in press for findings with children age 4-7). Based on previous findings, it is predicted that 2-year-olds might act on their preferences and take other people's belongings because they have not yet developed an awareness of other people's ownership rights; whereas 3-year-olds might uphold the ownership rights of others and refrain from acting on their preferences.

Children's action predictions

The second question to be addressed is whether children use ownership to predict people's actions and whether children expect others to respect ownership regardless of their preferences. Most research examining children's predictions of others' actions has focused on children's understanding of people's mental states (i.e., desires, beliefs, goals, and intentions; Gergely, Nádasdy, Csibra, & Bíró, 1995; Wellman & Bartsch, 1988; Wellman & Woolley, 1990; Woodward, 1998; also see Bartsch & Wellman, 1989). After watching an agent repeatedly reach for and grasp one of two objects, 6- and 9-month old infants look longer (i.e., are surprised) when the locations of the objects are switched and the agent reaches for the other object in the old location rather than the preferred object in the new location. Such findings suggest that infants infer people's goals and preferences from their actions, and subsequently expect people to act according to these mental states (Woodward, 1998). By age 3, children expect people to act according to their beliefs (i.e., children engage in belief-desire reasoning; Wellman & Bartsch, 1988), and by 4.5 years, believe people will act in accordance with their false beliefs (Baron-Cohen, Leslie, & Frith, 1985; Wellman & Bartsch, 1988; Wimmer & Perner, 1983; also see Wellman, Cross, & Watson, 2001; although see Onishi & Baillargeon, 2005 and Southgate, Senju, & Csibra, 2007 for findings suggesting that younger infants expect people to act on their false beliefs). For example, when predicting where a girl will look for her marble, 4-year-olds predict that she will look in the place she last put it (e.g., her basket) instead of its current location (e.g., a box), where her friend placed it without her knowledge (Baron-Cohen et al., 1985). Yet, no research examining children's action predictions has investigated whether ownership influences these predictions, and importantly, no research has examined children's action predictions when ownership conflicts with people's preferences (i.e., their mental states).

Put differently, it remains unknown how children predict people will act when they prefer someone else's property.

Previous research shows that children also predict people's actions from their group membership, allegiances, and social categories (Berndt & Heller, 1986; Chalik & Rhodes, 2014; Chalik, Rivera, Rhodes, 2014; DeJesus, Rhodes, & Kinzler, 2014; Pietraszewski & German, 2013; Rhodes & Brickman, 2011; Rhodes, Hetherington, Brink, & Wellman, 2015). At age 4, children expect individuals from one novel social group to withhold friendship from, and direct harm towards, members of other novel social groups (Chalik & Rhodes, 2014; Rhodes, 2012). For instance, in Chalik and Rhodes (2014), children were introduced to a group of people wearing red shirts (i.e., the "red group") and a group wearing blue shirts (i.e., the "blue group"). After children witnessed a conflict between a red group member and a blue group member, they were more likely to judge that other red group members hit, stole from, and teased someone from the blue group than they were to judge that these activities were directed towards another red group member. Similar findings have also been shown in violation-of-expectation paradigms with infants. When 16-month-olds witnessed two agents (e.g., Agent A and Agent B) in a conflict, they looked longer (i.e., were surprised) when the social partner of Agent A cooperated with Agent B than when the social partner engaged in a conflict with Agent B (Rhodes et al., 2015). Such findings suggest that infants use the experiences of an agent's social partner to predict how the agent will act. Further, a more nuanced ability to predict others' actions develops in 3-4-year-olds with advanced theory of mind (i.e., the ability to consider people's mental states), who predict that a person will direct harm towards someone they are angry with regardless of whether that person is in the same social group (Chalik et al., 2014). By age 5,

preschoolers also consider stereotypes, such as gender stereotypes, and predict that people's future actions will be stereotypical even if their past behavior was not (Berndt & Heller, 1986).

A few studies have investigated children's action predictions when a person's preference conflicts with deontic concepts (i.e., information which dictates what is permitted, obligated, or prohibited; Cummins, 1996), such as rules, social obligations, and social norms. However, these studies have yielded mixed findings. Children in some studies predicted that people would not act according to their desires if it meant they would violate social norms (Bernard, Clément, Kaufmann, 2016; Chernyak et al., 2013). For example, children aged 4-11 in the United States and Nepal predicted that a boy would not make his friend cry even though he wanted to upset his friend. However, with age, children in the United States were increasingly likely to predict that people would act on their desires regardless of whether these desires conflicted with social norms (Chernyak et al., 2013)[1]. In contrast, findings from other studies suggest children are as likely to predict that people will act according to their desires as they are to predict that people will act according to the rules (Kalish & Shiverick, 2004; Lagattuta, Nucci, & Bosacki, 2010; also see Kushnir et al., 2015).

In sum, we know that children are sensitive to people's preferences and desires when predicting their actions, but we have little information about whether children expect people to act on their desires for other people's property. One study examining children's action predictions included scenarios about ownership (Lagattuta et al., 2010). In that study, children were asked to predict whether an agent who wanted to paint would take her brother's paintbrushes, even though she was told not to. However, the analyses collapsed children's

[1] Action predictions of the Nepalese children did not differ with age—across all ages, children predicted that people would act in accordance with social norms regardless of their conflicting preferences. Such findings suggest that although children at young ages across cultures view social norms as constraining people's ability to act on their preferences, culture may influence how children reason about social norms at older ages.

responses across stories, and combined predictions to stories involving ownership with those from stories involving other moral violations, such as pushing and hitting. As such, it is unknown whether children use people's preferences to predict their actions when they desire other people's property. This question is addressed in Chapter 3.

Children's preference inferences

The third question to be addressed is whether children use ownership to infer which objects people prefer. It is possible that ownership influences these judgments because children and adults typically prefer their own property (the mere ownership effect; Beggan, 1992; Gelman & Davidson, 2016; Gelman et al., 2012; Hood, Weltzien, Marsh, & Kanngiesser, 2016), and place greater monetary value on objects they own compared with objects they do not own (the endowment effect; Harbaugh, Krause, & Vesterlund, 2001; Kahneman, Knetsch, & Thaler, 1990; Reb & Connolly, 2007; Thaler, 1980). Yet, there is some evidence suggesting that children do not expect others to prefer their own property. In a study by Gelman et al. (2012), 3-year-olds did not expect an experimenter to prefer an object she assigned to herself even though they preferred the object she assigned to them. Other findings also suggest that children do not infer who likes an object from information they use to infer who owns it (Malcom, Defeyter, & Friedman, 2014; Pesowski & Friedman, 2016), suggesting that children may not always believe that liking and ownership align.

Research investigating how children infer people's preferences shows that they consider people's verbal and emotional reactions (Fawcett & Markson, 2010; Repacholi & Gopnik, 1997). For example, after hearing a person express happiness after eating broccoli but disgust after eating crackers (e.g., said "Eww! Crackers! Eww!"), 18-month-old infants offered the person broccoli (Repacholi & Gopnik, 1997). Such findings suggest that infants can infer others'

preferences from their verbal and physical reactions, and can use this information to subsequently guide their own actions.

Furthermore, children infer people's preferences from their actions, and in particular, which objects they choose (Diesendruck, Salzer, Kushnir, & Xu, 2015; Kushnir, Xu, & Wellman, 2010; Ma & Xu, 2011). For example, 2-year-olds infer that a person prefers a boring kind of toy (e.g., wooden cubes) to a more interesting kind (e.g., slinkies) if she takes several boring toys out of a container of mostly interesting ones (Ma & Xu, 2011). At age 3, children can infer people's preferences from a single action. After seeing an agent select a toy, 3-year-olds infer that the agent prefers this toy, even if it is less attractive than the alternative one (Pesowski, Denison, & Friedman, 2016).

There is also some evidence that children consider object histories when evaluating objects. At age 4, children believe that objects belonging to famous people are worth more, and are more likely to belong in museums, than identical-looking objects belonging to non-famous people (Frazier & Gelman, 2009; Gelman, Frazier, Noles, Manczak, & Stilwell, 2015; also see Hood & Bloom, 2008). For instance, children believe that a rubber duck belonging to Ernie from Sesame Street belongs in a museum, whereas a rubber duck belonging to the experimenter's father does not (Frazier & Gelman, 2009). Children's object valuations are also influenced by whether the object was the first of its kind. At age 5, children believe that original creations, such as the very first Candy Land game, belong in museums (Frazier & Gelman, 2009), and at age 11 claim that these objects are worth more than similar-looking objects (Gelman et al., 2015).

In sum, we know that ownership influences children's own preferences for objects, but three things remain unknown. First, it is unclear whether children expect others to prefer their own property. Second, it remains unknown whether children consider other types of histories,

aside from celebrity contact and original creations, in their judgments about objects. Previous research shows that adults are sensitive to other types of object histories, like whether an object is from a distant time or location, when deciding whether they would want to keep or own the object (Frazier, Gelman, Wilson, & Hood, 2009), but it is unclear whether children are also sensitive to whether objects are from interesting places or are acquired in interesting ways. Third, it is unknown whether children use ownership and object history to infer which objects are special to owners. These questions are examined in Chapter 4.

Dissertation Overview

The following three chapters each contain an empirical manuscript addressing a key question related to how children consider ownership in relation to actions and preferences. For a visual depiction of my dissertation see Figure 1.

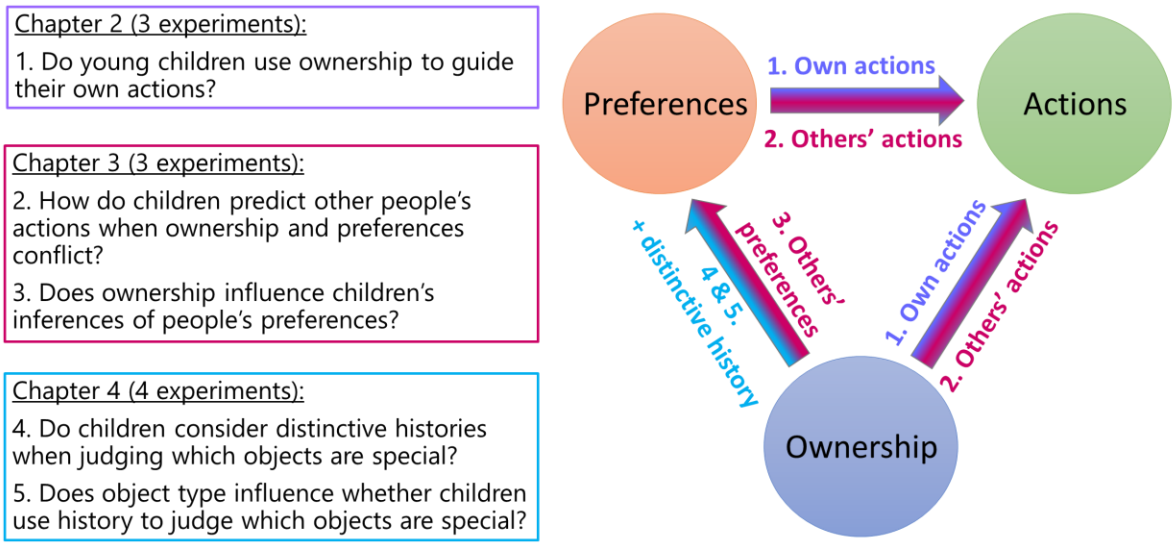


Figure 1. *Visual overview of my dissertation*. The arrow colors and labels correspond to each chapter, and the arrow numbers refer to the questions addressed in this dissertation. Chapter 2 is represented by purple arrows and labels, and investigates whether children understand that ownership limits their ability to act on their preferences (1). Chapter 3 is represented by pink arrows and labels, and investigates how children predict people will act when someone else's

property is preferred (2), and whether ownership influences children's inferences of which objects people prefer (3). Chapter 4 is represented by the blue arrow and asks whether children consider ownership, object history, and object type when judging which objects are special (4 and 5).

Do children heed ownership and refrain from acting on their preferences?

Chapter 2 investigates children's understanding of, and respect for, other people's ownership rights. Previous research examining this used methodologies that required children to verbally protest and physically intervene when other people's ownership rights were violated (Kanngiesser & Hood, 2014; Rossano et al., 2011). These past studies found that 2-year-olds did not act on the owner's behalf, which was interpreted as evidence that toddlers lack an awareness of others' ownership rights. However, it is possible that toddlers *are* aware of others' ownership rights but did not intervene because they were not motivated to act on the owner's behalf, did not want to interject in a situation that did not directly involve them, or expected the owner to protect his own ownership rights.

In three experiments, I examine whether 2- and 3-year-olds respect others' ownership rights when allocating resources to themselves and others. In each experiment, children were shown two groups of resources, told that one group of resources belonged to an agent, and then were asked to select resources for either themselves (Experiments 1-3) or the other agent (Experiments 2 and 3). This design allowed me to directly investigate whether young children actively refrain from violating others' ownership rights, rather than assessing their reactions to instances where people's ownership rights are violated.

Furthermore, previous research has shown that children typically self-maximize when allocating resources—they take all resources for themselves (Rochat et al., 2009; Smith, Blake,

& Harris, 2013; for discussion see Blake, McAuliffe, & Warneken, 2014). As such, this design also allowed me to examine whether children heed ownership or act on their preferences. In each of the three experiments in Chapter 2, I analyzed the number of resources children selected that belonged to the other agent.

Do children use ownership to predict people's actions and infer people's preferences?

Chapter 3 examines two questions and involves four experiments. The first aim was to investigate whether children use ownership to predict people's actions, particularly when their ownership conflicts with their preferences (i.e., when people prefer someone else's property). People may use or take their own objects, but it is typically unacceptable to act on objects belonging to other people, even if these objects are preferred or more desirable. Children age 3-6 were shown vignettes and asked to predict the actions of an agent by indicating which of two objects they expected the agent to take. In Experiment 1, one object was less desirable and unowned, while the other object was preferred and belonged to either the agent or someone else. In Experiment 2, one object was unattractive and belonged to the agent, while the other was more desirable and belonged to someone else. If children expect people to respect others' ownership rights, they should be more likely to predict the agent will take the preferred object when it is his than when it belongs to someone else in Experiment 1, and predict the agent will refrain from taking someone else's more attractive object in Experiment 2.

The second aim of this chapter was to investigate whether children use ownership to infer people's preferences—whether children believe owners prefer their property. In the final two experiments, children saw the same objects as in Experiment 2 but were not told any ownership information (Experiment 3) or were told that the less attractive object either belonged to the

agent or the agent's neighbor (Experiment 4). Together, the findings of Experiments 2, 3, and 4 allowed me to investigate whether ownership influences children's preference inferences.

Do children consider object histories to infer which objects are special to owners?

Chapter 4 further examines children's preference inferences and explores how children use object histories to infer which objects owners prefer. Interesting and distinctive histories often make objects more special than identical-looking objects that do not have this type of history. For instance, an original painting is often more important to people than a duplicate (for findings with adults see Frazier et al., 2009), and a keychain from a family vacation is likely more special to an owner than an identical-looking keychain that was recently bought at a local store.

In four experiments, I examined whether 4-7-year-olds view objects with distinctive histories (i.e., histories that are interesting) as more special than objects with mundane histories. To do this, I showed children pairs of identical-looking objects and described their histories. One object in the pair was described as new, and the other object was described as having either a distinctive history (e.g., was won as a prize) or a mundane history (e.g., bought at a store last week). Children were then asked to indicate which object in the pair was more special.

In the last two experiments, I also explore whether children's use of object histories to infer owners' preferences depends on the type of object. Findings from previous research suggest that children might be especially likely to attend to the histories of stuffed animals (Gelman & Davidson, 2016), so I specifically examined whether children's consideration of object histories depends on whether the objects are stuffed animals or regular objects, like keychains and baseballs.

Chapter Two: Two- and three-year-olds respect others' ownership rights when taking and allocating resources (Paper One)

A version of this paper is published:
Pesowski, M.L., Kanngiesser, P., & Friedman, O. (2019). Give and take: Ownership affects how 2- and 3-year-olds allocate resources. *Journal of Experimental Child Psychology, 185*, 214-223. doi: 10.1016/j.jecp.2019.04.011

We encounter many objects every day. Some of these objects belong to us, but most belong to other people. Knowing this distinction is important. For instance, believing that a roommate's toothbrush is ours could cause tension, and may also have some unsanitary consequences. However, understanding which objects belong to other people does not imply that we understand the implications of ownership, including ownership rights (Simon, 1977). Typically, owners can freely use their property, while non-owners are restricted from using or taking objects without the owner's permission (Snare, 1972). As such, cohesive social functioning requires two things: An understanding that objects belong to people, and an understanding that ownership confers rights.

Toddlers have the first kind of understanding—they know that other people own objects and do not believe everything is theirs. Between 1.5 and 2.5 years of age, toddlers begin to produce possessive pronouns, such as "mine" and "yours" (Hay, 2006; Tomasello, 1998; also see Saylor, Ganea, & Vàzquez, 2011). At age 2, toddlers can identify objects belonging to themselves, their parents, and others (Brownell, Iesue, Nichols, & Svetlova, 2013; Fasig, 2000; Ross, Friedman, & Field, 2015). They also use visual and verbal cues to infer what other people own (Blake, Ganea, & Harris, 2012; Blake & Harris, 2009; Friedman & Neary, 2008; Gelman et al., 2012). For instance, they infer that the owner of an object is the first person to possess it (Blake & Harris, 2009; Friedman & Neary, 2008).

However, this understanding does not imply that toddlers are aware of ownership rights. In fact, some research suggests that although toddlers are aware of their own ownership rights, they do not understand or respect the ownership rights of others. In interactions with peers and siblings, toddlers assert their ownership rights and defend their property (Eisenberg-Berg, Haake, & Bartlett, 1981; Eisenberg-Berg, Haake, Hand, & Sadalla, 1979; Hay & Ross, 1982; Ross, 1996, 2013; Ross et al., 2015). They also protest and intervene when their ownership rights are violated. For example, they protest when a puppet attempts to take and throw away their hat (Rossano, Rakoczy, & Tomasello, 2011; also see Kanngiesser & Hood, 2014). However, toddlers do not intervene when the puppet transgresses against another person's property (Rossano et al., 2011). In contrast, children aged 3 and older have been repeatedly shown to respect others' ownership rights (Neary & Friedman, 2014; Riedl, Jensen, Call, & Tomasello, 2015; Rossano et al., 2011; Schmidt, Rakoczy, & Tomasello, 2013).

Yet, toddlers may have a more precocious understanding of ownership rights than revealed by previous studies. In previous studies, toddlers may not have protested transgressions against others' property because they were reluctant to intervene in situations that did not directly involve them. Moreover, some findings suggest that toddlers may appreciate others' ownership rights (Pesowski & Friedman, 2015; Ross et al., 2015; Vaish, Carpenter, & Tomasello, 2009). For instance, 2-year-olds show empathy towards someone whose property was destroyed or taken away (Vaish et al., 2009), and they predict that owners will be upset when others use their property without permission (Pesowski & Friedman, 2015). However, these findings may not reflect an early awareness of ownership rights—perhaps children showed empathy because the victim was the target of aggression.

In the current paper, we explore whether toddlers recognize and respect others' ownership rights when selecting and allocating a windfall of resources. We also examined 3-year-olds' performance on this task to investigate development in children's understanding of ownership rights in this context. We felt a distribution task might allow us to reveal young children's competence as previous studies show that 3-year-olds, and even 2-year-olds, sometimes consider others' entitlements when distributing resources. For example, they consider merit and are more likely to share equally with a collaborating partner (Hamann, Warneken, Greenberg, & Tomasello, 2011; Kanngiesser & Warneken, 2012; Ulber, Hamann, & Tomasello, 2015; Warneken, Lohse, Melis, & Tomasello, 2011).

One previous study found that 3-year-olds did not respect others' ownership rights when selecting resources for themselves (Rossano, Fiedler, & Tomasello, 2015). However, the children had to infer which resources were owned based on how the resources were arranged, and 3-year-olds may have difficulty inferring ownership from such cues. Hence, it remains possible that 2- and 3-year-olds will respect others' ownership rights if they are explicitly told the resources belong to someone else.

In our experiments, children were shown resources and asked to select some. In Experiments 1 and 2, some resources were described as belonging to the children and other resources were described as belonging to another agent. In the first experiment, children selected resources that they could take home, and in the second experiment also selected resources for the other agent to take home. In Experiment 3, the resources were not described as belonging to the children. Instead, some resources belonged to another agent and other resources did not belong to him. Children again either selected resources for themselves or the other agent.

In all of the experiments, the other agent was always a teddy bear. Previous studies examining children's understanding of ownership, fairness, sharing, and many norms have often used puppets and stuffed animals as agents (e.g., Aknin, Broesch, Hamlin, & Van de Vondervoort, 2015; Gelman et al., 2012; Kanngiesser & Hood, 2014; Melis, Altrichter, & Tomasello, 2013; Rakoczy, Warneken, & Tomasello, 2008; Riedl et al., 2015; Rossano et al., 2011; Schmidt, Svetlova, Johe, & Tomasello, 2016; Vaish, Missana, & Tomasello, 2011). Using a stuffed animal ensured that the same owner could be present while children selected resources. We also used a stuffed animal instead of another child because this removed the potential for effects of familiarity.

Experiment 1: Respecting others' ownership rights when taking resources

Method

Participants. We tested 48 children: 24 2-year-olds (2;0-2;11, *M* age = 2;6, 9 boys), and 24 3-year-olds (3;0-3;10, *M* age = 3;5, 14 boys). Two additional 2-year-olds were tested but were not included in the analysis because they refused to participate midway through the task.

We tested different children in each experiment. In this experiment, we tested 24 children per age group, and in the subsequent experiments tested 24 children per condition in each age group. We based this stopping rule on previous studies that tested children in this age range (e.g., Rakoczy et al., 2008; Ulber et al., 2015). Children in all experiments were tested individually in their day cares in the Kitchener-Waterloo region. Although demographics were not formally collected, most residents in this region are middle-class, and approximately 85% of residents in this region are Caucasian, with Chinese and South Asians as the most visible minority.

Procedure. Children sat at a table with the experimenter to their right, and with eight foam shapes (four red, four yellow) directly in front of them. A cardboard apparatus was behind

the shapes, and a teddy bear was to the right of the apparatus (see Figure 2 for sample scripts and visual depictions of the testing arrangements for all experiments). Children were told that the shapes of one color belonged to them, and the shapes of the other color belonged to the teddy bear, which was referred to as "Mr. Bear". Then the experimenter put all of the shapes in a cylinder tube at the top of the apparatus, and gave children and the bear each a paper bag. Children were told that they could take their bag home and anything they put in it. The experimenter then removed a drawer from the apparatus containing the shapes and reintroduced them ("And look, here are the shapes"); the shapes were always arranged in the same formation (see Figure 2). Children were then asked to put a shape in their bag ("Get a shape to take home"), and were asked this four times so that their bag contained a total of 4 shapes (see Figure 2 for the exact script).

In all experiments, the color of the shapes belonging to the bear and the order in which children were told the ownership information (e.g., either the bear or the child first) was counterbalanced. Also, as shown in Figure 2, during the test trials, the shapes were arranged in a way that distributed the shapes equally within the box, while still looking potentially random. This arrangement also meant that children had to actively seek the shapes they wanted, such that if children randomly grabbed a handful, they would take similar amounts of their shapes and the bear's shapes. Children in all experiments were also asked comprehension questions to confirm they understood the ownership information (for details, see Figure 2). Some children remained silent or incorrectly answered these questions. When this happened, the experimenter repeated the ownership information and the comprehension question. If children responded incorrectly a second time, the experimenter corrected them and continued with the task.

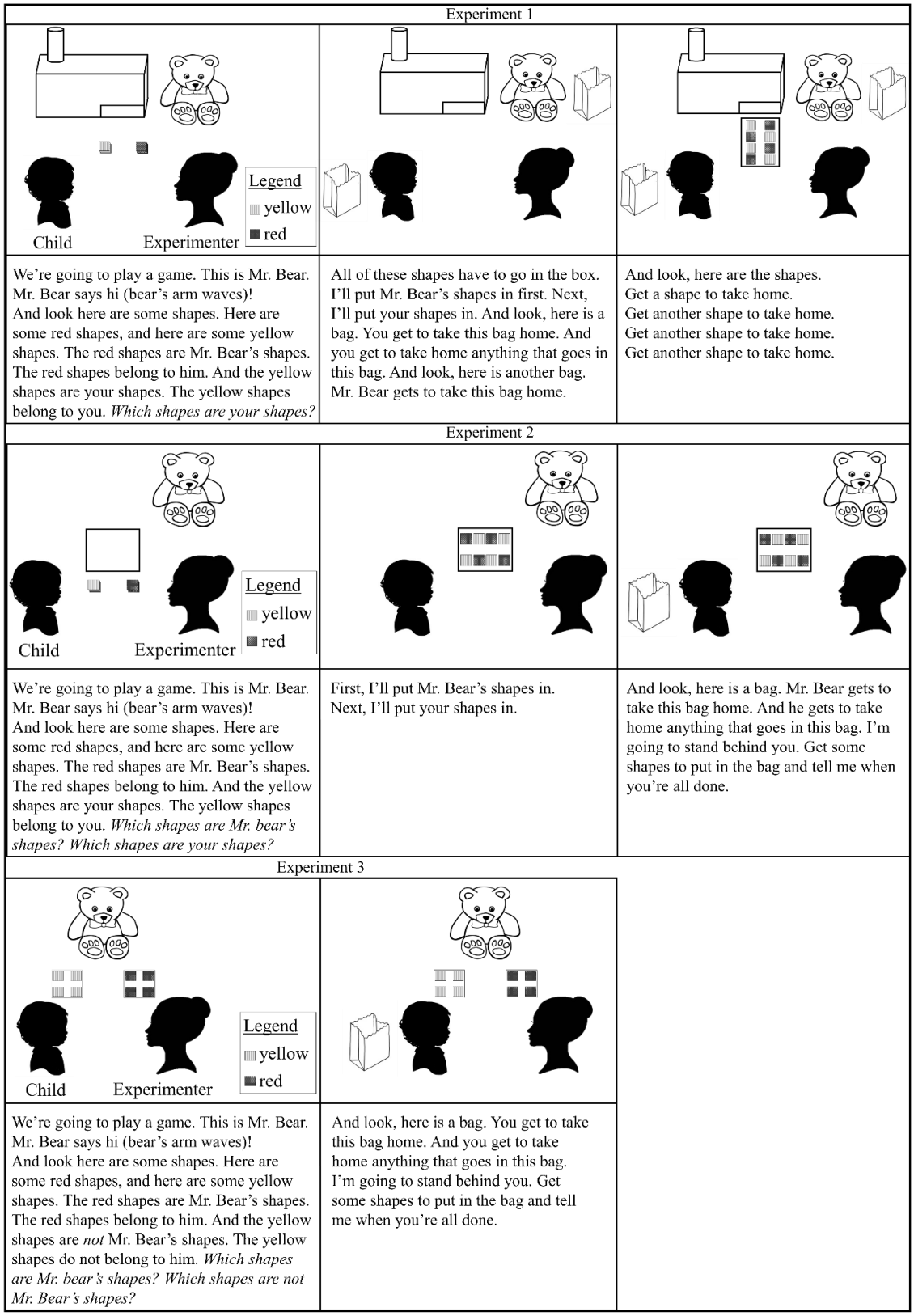


Figure 2. Testing arrangement and procedure for Experiment 1 (top panel), Experiment 2 (middle panel), and Experiment 3 (bottom panel).

Results and Discussion

If children respect the ownership rights of others, they should take fewer of the bear's shapes than their own shapes. However, if children are oblivious to others' ownership rights, they should select their shapes and the bear's shapes at similar rates. To test between these possibilities, we examined the number of the bear's shapes that children took (see Table 1 for the mean number of shapes children selected in each experiment; see Figure 3). Because children were limited to taking 4 shapes, this number ranged between 0 (i.e., they took none of the bear's shapes and only their own) and 4 (i.e., they took all of the bear's shapes and none of their own). An independent samples t-test revealed no significant difference between 2- and 3-year-olds' choices, $t(46) = .923$, $p = .361$. A one-sample t-test revealed that children took fewer of the bear's shapes than their own shapes (i.e., they took significantly fewer than 2 of the bear's shapes), $t(47) = -4.86$, $p < .001$; bear's shapes: $M = 1.13$, SD = 1.25; child's shapes: $M = 2.88$, SD = 1.25. The complete data from all experiments is available at https://osf.io/pgyjx/?view_only=5c938df89d7544d6bad468a195a75a3e.

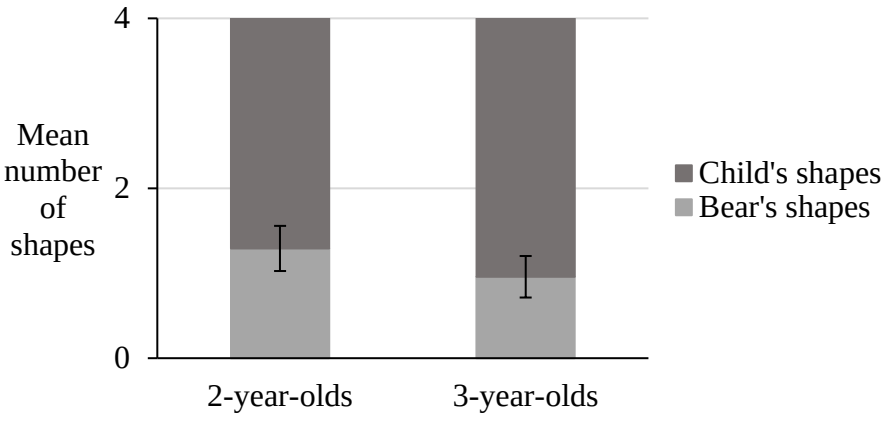


Figure 3. *Experiment 1.* Mean number of shapes children placed in their bag. Error bars show ± 1 standard errors of the means.

Table 1

Mean number of the bear's shapes (Experiments 1-3), the child's shapes (Experiments 1 and 2), and the shapes not belonging to the bear (Experiment 3) that were placed in the bag, with SDs in parentheses.

	2-year-olds		3-year-olds	
	Child-keeps	Bear-keeps	Child-keeps	Bear-keeps
Experiment 1				
Bear's shapes	1.29 (1.30)	---	.96 (1.20)	---
Child's shapes	2.71 (1.30)	---	3.04 (1.19)	---
Experiment 2				
Bear's shapes	2.08 (1.82)	3.33 (1.24)	1.33 (1.93)	3.63 (1.01)
Child's shapes	3.17 (1.44)	2.71 (1.73)	3.63 (1.01)	1.71 (1.99)
Experiment 3				
Bear's shapes	3.21 (1.59)	3.58 (1.14)	3.17 (1.66)	3.88 (.61)
Not-bear's shapes	3.71 (1)	2.75 (1.82)	3.21 (1.59)	1.5 (1.98)

These findings suggest that 2- and 3-year-olds respect others' ownership rights. They selected fewer of the bear's resources than their own. However, it is possible that children would have taken the bear's shapes if they could have taken more resources. Perhaps our findings only show that children preferred taking their own resources first.

In the next experiment, we addressed this concern and also examined whether children uphold their ownership rights and the rights of others when taking and giving resources. We removed the constraint on the number of resources children could select, and children were asked to either select resources that they could take home or select resources for the other agent to take home.

Experiment 2: Respecting ownership rights when taking and giving resources

Method

Participants. We tested 96 children: 48 2-year-olds (2;0-2;11, *M* age = 2;6, 31 boys), and 48 3-year-olds (3;1-3;11, *M* age = 3;5, 22 boys).

Procedure. Children were introduced to Mr. Bear and eight square foam shapes (four red, four yellow), and were told that the shapes of one color belonged to them and that the shapes of the other color belonged to Mr. Bear. The experimenter then placed the shapes into a shallow container in a predetermined pattern (see Figure 2). Children in each age group were randomly assigned to one of two between-subjects conditions. In the "child-keeps" condition, children were shown a paper bag and were told that they would get to take home the bag, and anything placed in it. In the "bear-keeps" condition, children were shown a paper bag and were told that Mr. Bear would get to take home the bag, and anything placed in it. Children in both conditions were then asked to put some shapes in the bag. In this experiment and the next, the experimenter stood behind the children and pretended to work while they were placing shapes into the bag, to avoid distracting or influencing them. If children did not touch any shapes after 3 seconds, the experimenter prompted them ("Get some shapes to put in the bag."). Children were instructed to tell the experimenter when they were done putting shapes into the bag. If children did not do this, the experimenter asked them if they were finished 3 seconds after they last touched a shape and remained still or walked away from the table.

Results and Discussion

If children respect the ownership rights of others, they should 1) select fewer of the bear's shapes when they can keep the bag compared with when the bear can keep it, and 2) select fewer of the bear's shapes than their own shapes when they can keep the bag. To investigate this, we examined the number of shapes children selected that belonged to the bear and to them (see Figure 4). A 2 (ownership: bear's shapes, child's shapes) x 2 (condition: child-keeps, bear-keeps)

x 2 (age: 2, 3) repeated-measures analysis of variance (ANOVA) yielded an interaction between ownership and condition, $F(1, 92) = 48.52$, $p < .001$, $\eta_p^2 = .35$, and a 3-way interaction between ownership, condition, and age, $F(1, 92) = 8.66$, $p = .004$, $\eta_p^2 = .09$. No main effects or other interactions were significant, $ps \geq .225$. To follow-up on these interactions, we conducted separate ownership by condition repeated-measures ANOVAs on children in each age group.

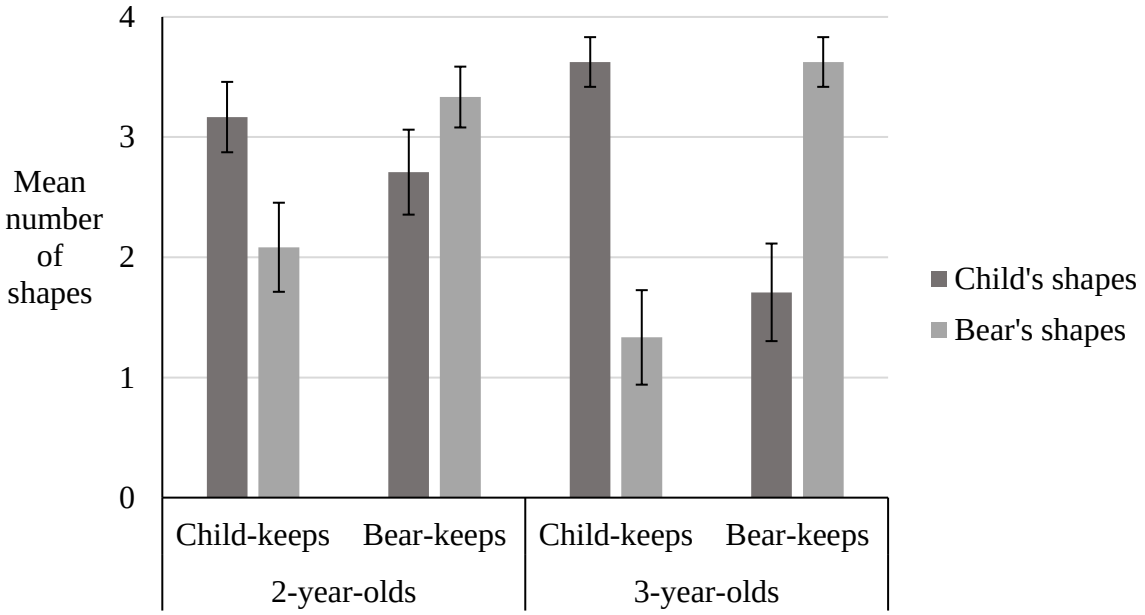


Figure 4. *Experiment 2.* Mean number of shapes placed in the bag. Error bars show ± 1 standard errors of the means.

Two-year-olds. The ANOVA yielded an interaction between ownership and condition, $F(1, 46) = 8.41$, $p = .006$, $\eta_p^2 = .16$, but no main effects, $ps \geq .258$; see Table 1 for mean scores and standard deviations. Consistent with a respect for the bear's ownership rights, children put fewer of the bear's shapes in the bag when they could keep it compared with when the bear could keep it, $t(46) = 2.79$, $p = .008$. Children placed their own shapes in the bag at similar rates when they could keep the bag and when the bear could keep it, $t(46) = 1.00$, $p = .323$.

Also, when children could keep the bag, they selected fewer of the bear's shapes than their own shapes, $t(23) = 2.37$, $p = .027$. This finding is again consistent with respect for the bear's ownership rights. When the bear could keep the bag, they selected their shapes and the bear's shapes at similar rates, $t(23) = -1.69$, $p = .105$.

Three-year-olds. The ANOVA revealed an interaction between ownership and condition, $F(1, 46) = 47.27$, $p < .001$, $\eta_p^2 = .51$, but no main effects, $ps \geq .543$. Consistent with a respect for the bear's ownership rights, children put fewer of the bear's shapes in the bag when they could keep it compared with when the bear could keep it, $t(46) = 5.16$, $p < .001$. Children placed fewer of their own shapes in the bag when the bear could keep it compared with when they could keep it, $t(46) = 4.21$, $p < .001$.

When children could keep the bag, they selected fewer of the bear's shapes than their own shapes, $t(23) = 4.98$, $p < .001$. This finding is again consistent with respect for the bear's ownership rights. When the bear could keep the bag, children selected more of the bear's shapes than their own shapes, $t(23) = -4.75$, $p < .001$.

Together, these findings show that 2- and 3-year-olds recognize and respect the ownership rights of others when allocating resources. Children refrained from taking the other agent's resources for themselves: 1) Children selected fewer of the bear's shapes when they could keep the bag compared with when he could keep it, and 2) when selecting shapes for themselves, children took fewer of the bear's shapes than their own shapes.

In this experiment and the previous one, children were told that some resources belonged to them and other resources belonged to another agent. In the next experiment, we examine how toddlers and young children allocate resources to either themselves or someone else when none of the resources are described as belonging to the children. It is important to investigate

children's respect for others' ownership rights in this context because children are not always explicitly told which objects belong to them and instead must consider other people's ownership rights when deciding which objects to take or use.

Experiment 3: Respecting ownership rights when only told about others' property

Method

Participants. We tested 96 children: 48 2-year-olds (2;0-2;11, *M* age = 2;7, 25 boys) and 48 3-year-olds (3;0-3;11, *M* age = 3;6, 32 boys). Four additional 2-year-olds were tested but were not included in the analysis because they refused to participate midway through the task.

Procedure. Children were introduced to Mr. Bear and eight square foam shapes (four red, four yellow), and were told that the shapes of one color belonged to Mr. Bear and that the shapes of the other color did *not* belong to him (see Figure 2). As in the previous experiment, children in each age group were randomly assigned to either a "child-keeps" or "bear-keeps" condition. To simplify the testing procedure, the shapes were arranged by color instead of the arrangement used in the first two experiments (see Figure 2). Children in both conditions were asked to put some shapes in the bag, and the number of shapes selected was not restricted.

Results and Discussion

If children respect the ownership rights of others, they should 1) select fewer of the bear's shapes when they can keep the bag compared with when the bear can keep it, and 2) select fewer of the bear's shapes than the other shapes (i.e., those not belonging to the bear) when they can keep the bag. To investigate this, we examined the number of shapes that did and did not belong to the bear that children placed in the bag (see Figure 5). A 2 (ownership: bear's shapes, not-bear's shapes) x 2 (condition: child-keeps, bear-keeps) x 2 (age: 2, 3) repeated-measures ANOVA revealed a main effect of ownership, $F(1, 92) = 10.61$, $p = .002$, $\eta_p^2 = .10$, a marginal

effect of condition, $F(1, 92) = 3.11$, $p = .081$, $\eta_p^2 = .03$, and a marginal effect of age, $F(1, 92) = 2.80$, $p = .098$, $\eta_p^2 = .03$. It also yielded an ownership by condition interaction, $F(1, 92) = 20.98$, $p < .001$, $\eta_p^2 = .19$, and an ownership by age interaction, $F(1, 92) = 5.97$, $p = .016$, $\eta_p^2 = .061$. No other interactions were significant, $ps \geq .189$.

We then examined the ownership by condition interaction. Consistent with a respect for the bear's ownership rights, children put fewer of the bear's shapes in the bag when they could keep it ($M = 3.19$, SD = 1.61) compared with when the bear could keep it ($M = 3.73$, SD = .92), $t(94) = 2.03$, $p = .045$. Children placed more of the other shapes (i.e., those not belonging to the bear) in the bag when they could keep it ($M = 3.46$, SD = 1.34) compared with when the bear could keep it ($M = 2.13$, SD = 1.99), $t(94) = 3.86$, $p < .001$.

When children could keep the bag, they selected the bear's shapes and the other shapes at similar rates, $t(47) = -.86$, $p = .394$. This finding is inconsistent with a respect for the bear's ownership rights. When the bear could keep the bag, children selected more of the bear's shapes than the other shapes, $t(47) = 5.72$, $p < .001$.

We also examined the ownership by age interaction. Two-year-olds selected the bear's shapes and the other shapes at similar rates, $t(47) = .65$, $p = .519$, whereas 3-year-olds selected more of the bear's shapes, $t(47) = 3.13$, $p = .003$. This interaction did not include condition as a factor, so it is uninformative about whether children respect others' ownership rights.

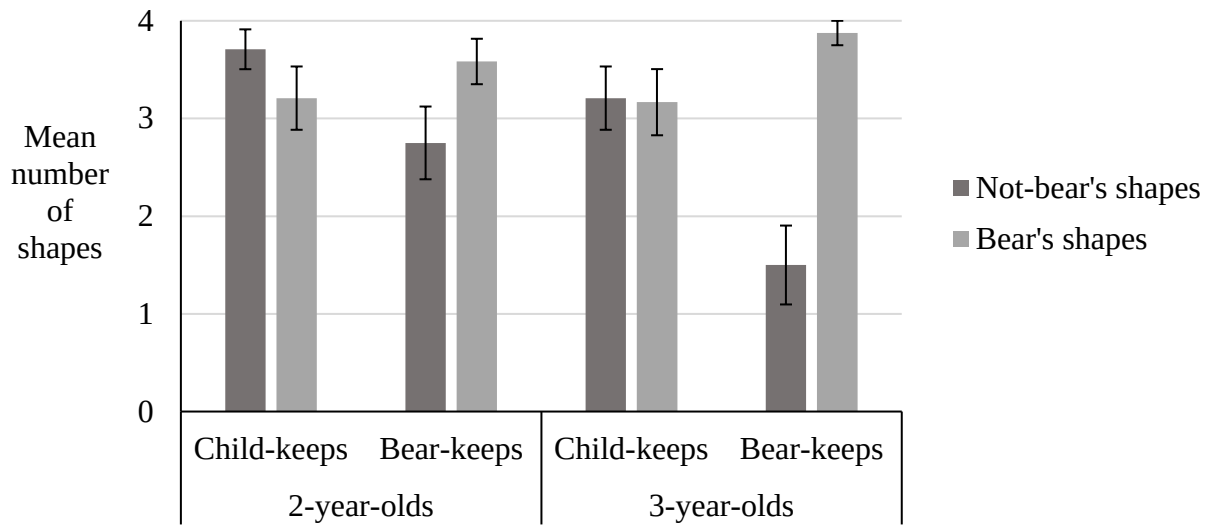


Figure 5. *Experiment 3.* Mean number of shapes children placed in the bags. Error bars show ± 1 standard errors of the means.

These findings provide some further evidence that young children respect others' ownership rights. Children selected fewer of the bear's shapes when they could keep the resources than when they selected resources for the bear to keep. If children were oblivious to the ownership rights of others, they should have selected the bear's shapes at similar rates when selecting resources for the bear and themselves. However, in contrast to the findings of the first two experiments, children chose the bear's shapes and the other shapes at similar rates when they could keep the resources. It is possible that children in this experiment viewed the shapes not belonging to the bear as owned by someone else—stating that an object does not belong to someone does not mean that it is completely unowned. Viewing the shapes not belonging to the bear as being owned by someone else would have made it difficult for children to decide which shapes would be more acceptable to take for themselves.

General Discussion

In three experiments, we investigated whether 2- and 3-year-olds recognize and respect others' ownership rights when taking resources for themselves and allocating resources to others. In Experiments 1 and 2, children took fewer of another agent's resources than their own when selecting resources to keep. In Experiments 2 and 3, children selected fewer of the other agent's resources for themselves compared with when the other agent could keep the resources. However, when children in Experiment 3 could keep the resources, they selected the resources belonging to another agent and the resources not belonging to him at similar rates. Moreover, although it might be expected that 3-year-olds show greater respect for others' ownership rights than 2-year-olds, we only found this in our second experiment. In our first and third experiments, 2- and 3-year-olds showed similar respect for others' ownership rights.

These findings provide the first *direct* evidence that 2-year-olds recognize and respect the ownership rights of others. If children in our experiments only understood who owned the various resources and were oblivious to others' ownership rights, they would have taken resources at similar rates regardless of who owned them. However, when children selected resources to keep, they selected fewer of the other agent's resources than their own resources (Experiments 1 and 2). This finding suggests toddlers are aware that their own actions (i.e., which objects they can take) are limited by others' ownership, subsequently showing that they understand others' ownership rights.

As such, our findings go beyond previous demonstrations that toddlers and preschoolers distinguish between their belongings and those of others (Brownell et al., 2013; Fasig, 2000; Ross et al., 2015). Some previous findings were consistent with toddlers showing respect for others' ownership rights, but were inconclusive. For example, Ross et al. (2015) found that 2-

year-olds were more likely to offer their friend's toy to their friend than their own toy during play. However, children only did this when both toys were available. When the only toy available belonged to their friend, children did not reliably offer it. It is, therefore, possible that children gave their friend's toy to their friend in the earlier scenario because they did not want their own toy to be used by another person. Hence, although Ross et al.'s findings show that children uphold their own ownership rights, these findings are inconclusive about whether children recognize others' rights (for further discussion of this point see Ross et al., 2015 on pp. 354-355).

Toddlers' success in considering others' ownership rights contrasts with findings from previous studies in which toddlers did not intervene when other people's ownership rights were violated (Kanngiesser & Hood, 2014; Rossano et al., 2011). One possible reason for this difference is that the current tasks involved a simpler situation. Whereas toddlers had to consider two people in the previous studies (i.e., an owner and a transgressor), toddlers only had to consider one other person in our tasks. Also, toddlers in the previous studies may have understood that someone else's ownership rights were violated, but were not motivated to intervene. Our measure avoided these motivational demands.

Our findings also provide some evidence that ownership limits 3-year-olds' self-maximizing behaviors. When distributing a windfall of resources such as stickers, 3-year-olds tend to take all of the resources for themselves and give none (or vanishingly little) to others (Rochat et al., 2009; Smith, Blake, & Harris, 2013; for a discussion see Blake, McAuliffe, & Warneken, 2014). However, this tendency is limited in some situations, such as when collaborating with another agent to acquire resources (Hamann et al., 2011; Warneken et al., 2011). If children self-maximized in our experiments, they would have taken all of the resources.

Instead, 3-year-olds in Experiment 2 did not take all of the resources for themselves. It is important to note, however, that children in Experiment 3 did self-maximize. As mentioned above, though, children in this experiment may have assumed that the resources not belonging to the other agent were actually owned by someone else. Future studies could investigate how children allocate resources when some resources are described as "not belonging to anyone".

It is possible that our methods made it especially easy for toddlers to respect others' ownership rights. In our experiments, children were told who owned the resources, and the resources were easily distinguishable from one another but not particularly desirable. Perhaps toddlers would show less concern for others' ownership rights if the other person's resources were more desirable than their own, were more plentiful, or looked identical to their resources. This possibility is broadly consistent with research showing that 2-year-olds have difficulty tracking ownership of objects when the objects look identical (Gelman et al., 2012). This possibility is also broadly consistent with research showing that toddlers are more likely to share equally with another person if the objects look distinct rather than identical (Ulber et al., 2015). Furthermore, the presence of the owner in our experiments may have led children to respect ownership to avoid conflict. Although our findings reveal that toddlers recognize and respect others' ownership rights, there is still much to learn about which contexts facilitate this respect.

Chapter Three: When preferences and ownership conflict: Young children consider ownership when predicting people's actions and inferring their preferences (Paper Two)

A version of this paper is published:
Pesowski, M.L. & Friedman, O. (2018). Using versus liking: Young children use ownership to predict actions, but not to infer preferences. *Journal of Experimental Child Psychology, 169*, 19-29. doi: 10.1016/j.jecp.2017.12.007

Imagine you are at a restaurant with a blind date and you each order entrées. When the food arrives, it is apparent to both of you that you have the more appealing meal. Nonetheless, you expect your date to eat his own food, and you would be surprised if he began eating food from your plate instead of his own. This would be surprising because we expect people to consume or use items that belong to them, regardless of whether someone else has a more appealing item. This example illustrates our ability as adults to use ownership to predict people's actions. More specifically, it illustrates that we typically expect people to respect ownership even when they prefer someone else's property.

In the current paper, we investigate whether young children use ownership to predict agents' actions, and whether they do this even when agents prefer other people's property. Considering ownership is often necessary to accurately predict people's actions. If you ignored ownership and simply used desires and preferences to predict your date's actions, you would erroneously expect him to attempt to eat your delicious dinner. Determining whether children expect others to respect ownership, even when they prefer someone else's property, is important because it will expand our knowledge of how children predict and understand people's actions. Furthermore, investigating children's ability to use ownership to predict people's actions will be informative about the types of inferences they can make from ownership. Previous research has shown that young children use ownership to judge whether actions are acceptable (Kim & Kalish, 2009; Neary & Friedman, 2014; Rossano, Rakoczy, & Tomasello, 2011), to predict

people's emotions (Pesowski & Friedman, 2015), and to infer history (Nancekivell & Friedman, 2014). However, no studies have directly investigated whether young children consider ownership when predicting people's actions.

How Young Children Predict Others' Actions

Most research investigating children's ability to predict people's actions has focused on theory of mind–the ability to consider people's mental states, such as desires and beliefs (e.g., Bartsch, 1996; Bartsch & Wellman, 1989; Cassidy et al., 2005; Wellman & Bartch, 1988; Wellman & Woolley, 1990; Woodward, 1998). At age 2, children consider people's desires when predicting their actions. For example, they predict that a person will continue to search for a desired object until it is found (Wellman & Woolley, 1990). From around age 4, children consider people's false beliefs when explicitly predicting their actions (e.g., Wellman & Bartsch, 1988; Wellman, Cross, & Watson, 2001; Wellman & Liu, 2004).

Children also predict people's actions using information from outside the domain of theory of mind. They predict actions using different types of social information, such as social categories, social allegiances, and group membership (Berndt & Heller, 1986; Chalik & Rhodes, 2014; Chalik, Rivera, Rhodes, 2014; DeJesus, Rhodes, & Kinzler, 2014; Pietraszewski & German, 2013; Rhodes, 2012; Rhodes & Brickman, 2011; Rhodes, Hetherington, Brink, & Wellman, 2015). Preschoolers use stereotypes to predict people's actions, even when their previous behaviors were inconsistent with stereotypes. For example, 5-year-olds expect a boy to fix a bike instead of bake brownies, even though he previously chose to bake brownies (Berndt & Heller, 1986). Additionally, at age 4, children predict that individuals from one group will retaliate and withhold friendship from members of other conflicting social groups (Chalik &

Rhodes, 2014); and by age 6, they expect individuals to favor their own group when distributing scarce resources (DeJesus, Rhodes, & Kinzler, 2014; see also Rhodes & Brickman, 2011).

Children also predict actions using deontic information, such as moral rules and social norms (Bernard, Clément, Kaufmann, 2016; Chernyak, Kushnir, Sullivan, & Wang, 2013; Kalish & Cornelius, 2007; Kalish & Shiverick, 2004; Lagattuta, Nucci, Bosacki, 2010; Weller & Lagattuta, 2013). For instance, 4-year-olds judge that a person will not physically harm someone even if they want to (Chernyak et al., 2013).

Do Children Use Ownership to Predict Actions?

It is plausible that young children may also consider ownership when predicting people's actions. This is plausible because children are adept in considering ownership from early in development (Blake, Ganea, & Harris, 2012; Kanngiesser, Gjersoe, & Hood, 2010; Kanngiesser & Hood, 2014; Friedman, 2008; Gelman, Noles, & Stilwell, 2014; Gelman et al., 2012; for a review see Nancekivell, Van de Vondervoort, & Friedman, 2013). By age 3, children can track and identify their own objects (Gelman et al., 2012), attribute ownership to others (Kanngiesser & Hood, 2014), and link ownership to creatively laboring on objects (Kanngiesser et al., 2010).

It is also plausible that young children use ownership to predict actions because older children do so. Specifically, 6- and 8-year-olds consider ownership when predicting who will win conflicts over property and who will spend more time searching for lost objects (Pietraszewski & Shaw, 2015). However, these findings have only been shown in older children, so it is unknown whether younger children also consider ownership when predicting actions. Furthermore, these findings do not show whether children use ownership to predict an agent's actions when an agent prefers or desires someone else's property over their own.

However, there are also reasons why young children might have difficulty using ownership to predict others' actions. Children do not reliably predict an individual's actions from norms or rules when these factors conflict with the individuals' preferences (Bernard et al., 2016, Experiment 1; Kalish & Shiverick, 2004, Experiment 2; see also Lagattuta et al., 2010). For example, when children are told "Johnny likes to flimmer. The rule is to not flimmer.", 5- and 8-year-olds predict Johnny will act according to his desires and the rules at similar rates (Kalish & Shiverick, 2004, Experiment 2; but see Bernard et al., 2016 for findings showing that young children do give rule-based predictions in some contexts). Given that young children weigh rules and mental states similarly when predicting actions, children may not reliably use ownership to predict people's actions.

Also, young children sometimes show a less mature understanding of ownership than older children. Between the ages of 2-5, children are increasingly able to identify situations in which ownership should be transferred between a gift-giver and a recipient (Blake & Harris, 2009), and between the ages of 3-5, they become increasingly likely to reference ownership in their explanations for why it is acceptable or unacceptable to use an object (Nancekivell & Friedman, 2017). Given such developmental differences, there might also be a development in children's use of ownership to predict actions. When ownership and preferences conflict, younger children may be more likely to use preferences to predict agents' actions, while older children might use ownership.

The Current Experiments

We investigated whether children expect agents to respect ownership even when the agents prefer objects belonging to other people. In Experiment 1, children aged 3-6 saw vignettes in which an agent could take either of two objects to fulfill a goal. One object was unowned,

while the other object was preferred by the agent and either belonged to the agent or to someone else. In Experiment 2, 3-5-year-olds saw vignettes in which the object belonging to the agent was visibly less preferable than the object belonging to someone else.

Finally, the findings of the second experiment led us to examine a somewhat different question in Experiments 3 and 4. These experiments investigated whether ownership affects 3- and 4-year-olds' judgments of agents' preferences. This possibility is related to the "mere ownership effect"—the phenomenon that owners prefer their own objects over similar-looking ones (Beggan, 1992). Previous research has shown this effect in children (Gelman & Davidson, 2016; Gelman et al., 2012, Experiment 2); however, we were interested in whether children consider ownership when inferring others' preferences.

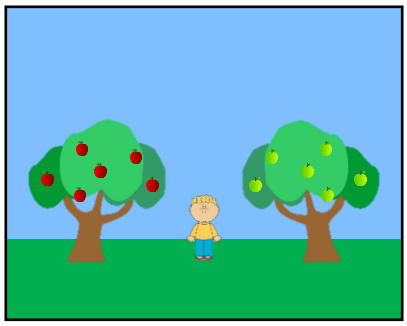
Experiment 1: Predicting actions when ownership and preference conflict

Methods

Participants. The participants were 36 3-year-olds (M_{age} = 3;5, range = 3;0-3;11, 17 males), 36 4-year-olds (M_{age} = 4;6, range = 4;0-4;11, 24 males), 35 5-year-olds (M_{age} = 5;7, range = 5;0-5;11, 15 males), and 36 6-year-olds (M_{age} = 6;6, range = 6;0-6;11, 18 males). In all experiments, children were individually tested at schools and daycares in the Kitchener-Waterloo Region. Demographic information was not formally collected, but the region is predominantly middle-class, and approximately 85% of residents in this region are Caucasian, with Chinese and South Asians as the most visible minority. Different children were tested in each experiment.

Materials and Procedure. For this experiment, and those subsequent, vignettes were shown on a laptop computer. Children were shown two stories each about an agent and two objects (a boy and two apple trees in story 1, a girl and two seashells in story 2). In each story, the agent preferred one object over the other (the boy preferred red apples over green apples, the

girl preferred larger seashells over smaller seashells). Children were randomly assigned to one of two conditions. In one condition, the agent owned the preferred object. In the other condition, the preferred object belonged to someone else (e.g., a woman). In both conditions, the less preferred object was unowned. After hearing each story, children were asked to predict which object the agent would take (e.g., "Which tree will the boy pick an apple from?"). Following this, children were asked a comprehension question confirming they knew which object was owned. Finally, children were asked whether it was acceptable for the agent to take the object they previously indicated; responses to this question were not particularly informative, and so we do not include them in our analyses. See Figure 6 for a sample image and script.



Here is a boy, and he is very hungry. He wants to pick an apple. He loves red apples. And look! Here is a tree with red apples on it! This tree belongs to [the boy/a woman]. And look! Here is another tree with green apples on it! This tree doesn't belong to anyone.

Which tree will the boy pick an apple from? Which tree belongs to [the boy/a woman]? Is it okay for the boy to pick an apple from this tree (pointing to the tree the child chose for Q1)?

Figure 6. *Experiment 1.* Sample image and script. Text varying between conditions appears in square brackets.

When asked to predict which object the agent would choose, two 3-year-olds said "I don't know" or remained silent. When this happened, the experimenter began the scenario anew and repeated the question. One child gave an informative response, whereas the other child did not. These responses from both children were used in the analysis. Children also sometimes remained silent or said "I don't know" to the comprehension or acceptability questions (one 6-year-old, and one 3-year-old respectively). When this happened, the experimenter repeated the question and the children's responses to this question were used in the analysis.

Results and Discussion

To examine whether ownership was used to predict agents' actions, even when they prefer someone else's property, children were scored 1 each time they predicted the agent would choose the preferred object (e.g., the red apple tree in trial 1, and the big seashell in trial 2), and 0 each time they indicated the less-preferred object or responded with "I don't know" (one 3-year-old). Children's scores could range between 0 and 2; mean scores are shown in Figure 7.

A 2 (condition: agent-owns preferred object, other-owns preferred object) x 4 (age in years: 3, 4, 5, 6) analysis of variance (ANOVA) yielded a main effect of condition, with children more likely to indicate the preferred object when it belonged to the agent than when it belonged to someone else, $F(1, 135) = 42.80$, $p < .001$, $\eta_p^2 = .24$. There was also a main effect of age, $F(3, 135) = 4.16$, $p = .007$, $\eta_p^2 = .09$, and an age by condition interaction, $F(3, 135) = 2.88$, $p = .039$, $\eta_p^2 = .06$. As can be seen in Figure 7, this interaction resulted because children's responses varied between conditions at every age, except for age 4: 3-year-olds, $t(34) = 2.71$, $p = .011$; 4-year-olds, $t(34) = 1.63$, $p = .113$; 5-year-olds, $t(33) = 3.56$, $p = .001$; 6-year-olds, $t(34) = 4.75$, $p < .01$.

Further analyses examined whether children at each age chose the owned object at rates departing from chance (i.e., whether scores differed from the chance score of 1). When the preferred object belonged to the agent, children at all ages chose this object at rates exceeding chance, single-sample t-tests, ps $< .001$. When the preferred object belonged to someone else, 3-, 5-, and 6-year-olds chose this object at chance, ps $> .138$, while 4-year-olds chose this object at rates exceeding chance, $p = .001$.

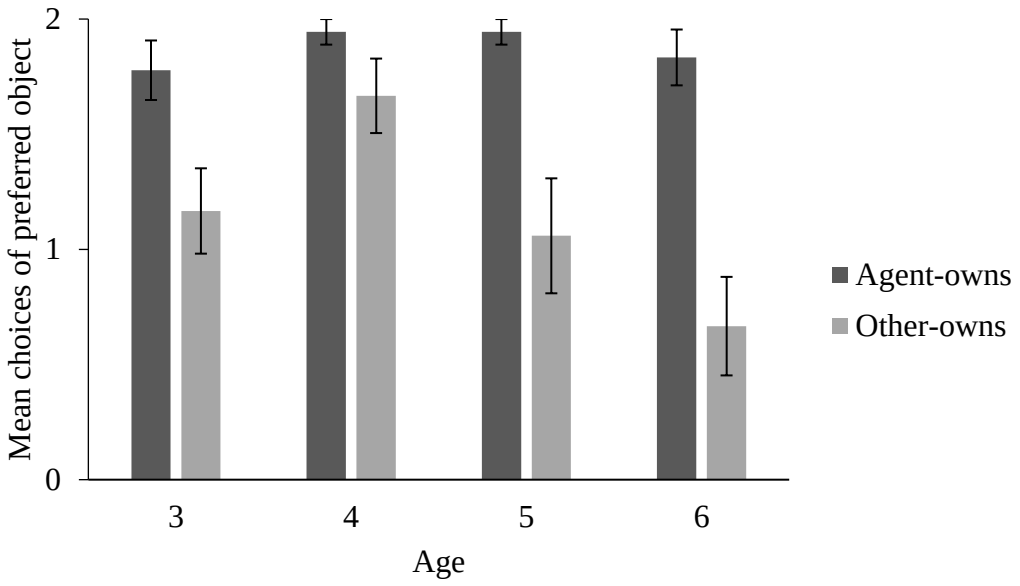


Figure 7. *Experiment 1.* Mean times children indicated the preferred object. Error bars show ± 1 standard errors of the means.

These findings suggest that children consider ownership when predicting people's actions. In general, children predicted that the agents would take the preferred object more when it belonged to them than when it belonged to someone else. Although children expected agents to take their own property, the findings do not suggest that children expect agents to respect ownership when they prefer someone else's property. When the preferred object belonged to someone else, children generally predicted that the agents would take the preferred and less preferred objects at similar rates[2]. As such, children's performance in this experiment is broadly consistent with previous findings showing that children do not reliably predict individuals' actions from rules or preferences when they conflict with one another (Bernard et al., 2016, Experiment 1; Kalish & Shiverick, 2004, Experiment 2; see also Lagattuta et al., 2010).

[2] The findings from 4-year-olds were an exception to this pattern—they predicted that the agents would take the preferred object regardless of whether it belonged to the agent or to someone else. This finding is surprising given that 3-year-olds' predictions differed between conditions. We suspect that the 4-year-olds' performance was a fluke.

However, it is possible that several elements of this experiment undermined children's use of ownership to predict others' actions. Children might have been reluctant to predict that the agents would take the unowned items because they appreciate that it is not always permissible to take these items. For instance, it is not typically appropriate to take plants or flowers from public gardens, even though these items may be unowned. Furthermore, it might have been difficult for children to track and consider all of the verbal information told to them. Accurately predicting the agent's action required children to remember the ownership of each object as well as the agent's preference.

Given these concerns, the next experiment used simpler methods. Because 5- and 6-year-olds performed similarly in the current experiment, the next experiment only includes 3-5-year-olds.

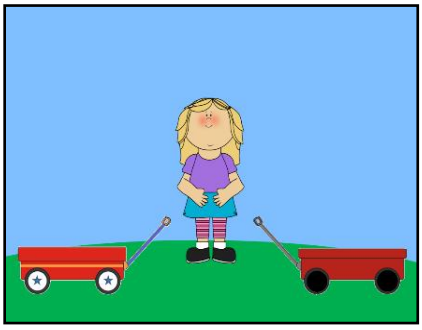
Experiment 2: Predicting actions when other objects are visually more attractive

We examined children's predictions in situations where an agent preferred someone else's property over the agent's own property. The object belonging to the agent was visibly less preferable than the object belonging to someone else. By making preferences inferable, we reduced the memory demands of the task, and also made the scenarios more similar to real life: Being explicitly told someone's preference is uncommon in daily interactions—typically, we must *infer* people's preferences, and one way we do this is by considering the quality and attractiveness of the available objects. For instance, while at dinner you inferred that your date preferred your bigger more appealing meal over his smaller and plainer one. Lastly, the items used in this experiment were artifacts instead of natural kinds.

Methods

Participants. The participants were 40 3-year-olds (M_{age} = 3;6, range = 3;0-3;10, 20 males), 40 4-year-olds (M_{age} = 4;5, range = 4;0-4;11, 19 males), and 40 5-year-olds (M_{age} = 5;7, range = 5;0-5;11, 22 males).

Materials and Procedure. Children saw two vignettes involving an agent with an attractive object and a comparatively less attractive object (a girl and two wagons in story 1, and a boy and two toy cars in story 2). In both stories, the unattractive object belonged to the agent, and the attractive object belonged to someone else. Depending on the condition to which children were randomly assigned, they were either asked which object the agent will take ("Which wagon will the girl take home?") or which object the agent likes more ("Which wagon does the girl like more?"). See Figure 8 for a sample image and script.



Here is a girl. She is at the park. And look! Here is a wagon (right). This wagon belongs to the girl. And look! Here is another wagon (left). This wagon belongs to someone else.

[*Which wagon will the girl take home? / Which wagon does the girl like more?]*

Figure 8. *Experiment 2.* Sample image and script. Text varying between conditions appears in square brackets.

Some children were silent or responded with "I don't know" (two 3-year-olds and one 5-year-old). For these children, the experimenter began the scenario anew. Children's responses to the repeated questions were recorded and the experimenter continued with the task.

Results and Discussion

To examine whether children use ownership to predict agents' actions, even when the agents prefer other people's property, they were scored 1 when they indicated the unattractive object belonging to the agent, and 0 when they indicated the attractive object belonging to

someone else, or said "I don't know" (one 3-year-old). Children's scores could range between 0 and 2; mean scores are shown in Figure 9.

Scores were entered into a 2 (question type: behavior, preference) x 3 (age in years: 3, 4, 5) analysis of variance (ANOVA). The analysis yielded no effect of age, $F(2, 114) = 1.42$, $p = .247$, $\eta_p^2 = .02$; and a main effect of condition, with children being more likely to indicate the object owned by the agent when predicting which object the agent would take than when judging which object the agent preferred, $F(1, 114) = 27.50$, $p < .001$, $\eta_p^2 = .19$. There was also an age by condition interaction, $F(2, 114) = 3.60$, $p = .030$, $\eta_p^2 = .06$, meaning that children's responses were more likely to vary by condition at older ages. Follow-up t-tests found that 3-year-olds' responses did not vary by condition, $t(38) = -.92$, $p = .364$, while 4- and 5-year-olds were more likely to indicate the agent's own object when predicting which object the agent would take than when predicting which object the agent liked more, $t(38) = -3.27$, $p = .002$, and $t(38) = -5.34$, $p < .001$ respectively.

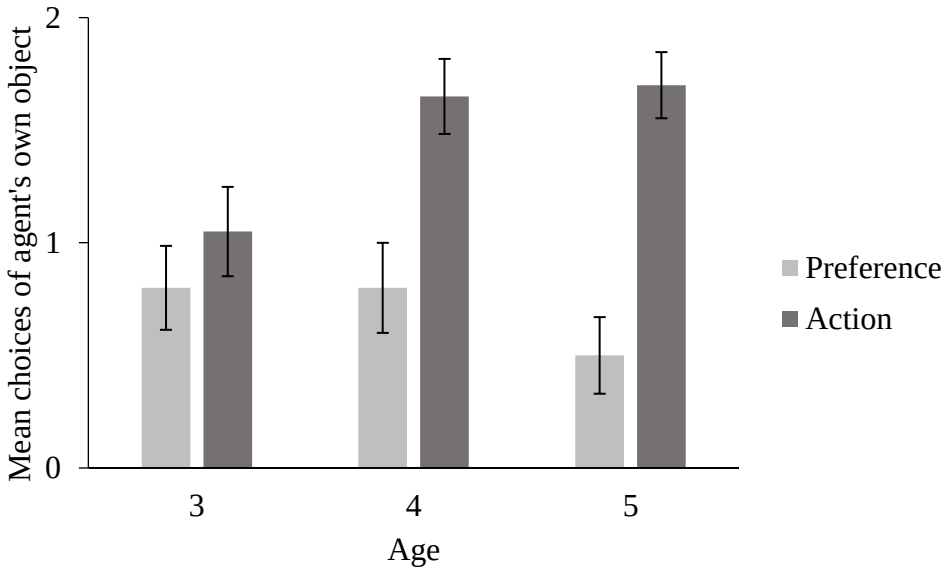


Figure 9. *Experiment 2.* Mean times children indicated the agent's own object. Error bars show ± 1 standard errors of the means.

Further analyses were conducted to better understand children's performance at each age. When asked to predict which object the agent will take home, 4- and 5-year-olds indicated the agent's own object at rates exceeding chance, single-sample t-tests, *p*s ≤ .001, but 3-year-olds did not, $p = .804$. When asked to indicate which object the agent likes more, 5-year-olds chose the agent's own object less than expected by chance, $p = .008$, but 3- and 4-year-olds did not, $p = .297$ and $p = .330$ respectively.

These findings show that 4- and 5-year-olds consider ownership when predicting people's actions. Further, 5-year-olds predict people will respect ownership even when they prefer other people's property. Although 4-year-olds were sensitive to ownership, they did not infer that the agents preferred the more attractive objects belonging to other people. Because of this, it is unclear whether 4-year-olds expect people to respect ownership when they prefer other people's property.

It is surprising that the 3- and 4-year-olds did not infer that the agents preferred the more attractive objects belonging to other people. One possibility is that younger children believed the attractive objects were more preferable but ownership influenced their liking judgments. More specifically, children could have inferred that ownership of the less attractive object increased the agent's preference for it.

To examine this possibility, we conducted another experiment in which ownership information was not given and children were simply asked to infer which object the agent liked more. Without information about ownership, we anticipated that children would infer that the agents prefer the more attractive objects.

Experiment 3: The effect of ownership on preference judgments

Methods

Participants. The participants were 20 3-year-olds (M_{age} = 3;8, range = 3;1-3;11, 12 males) and 20 4-year-olds (M_{age} = 4;5, range = 4;0-4;11, 7 males).

Materials and Procedure. Children were shown the vignettes from Experiment 2 (a girl and two wagons in story 1, and a boy and two toy cars in story 2), but were not told any information about ownership. Children were then asked which object the agent liked more. Here is a sample script (see Figure 8 for a sample image):

> Here is a girl. She is at the park. And look! Here are two wagons.
> *Which wagon does the girl like more?*

Results and Discussion

Children were scored 1 each time they inferred the agent likes the unattractive object more, and were scored 0 each time they indicated the attractive object.

To examine whether ownership affected children's liking judgments, we compared their scores from this experiment with their scores from the liking condition in Experiment 2, which included ownership information. A 2 (age in years: 3, 4) x 2 (experiment: 2, 3) ANOVA revealed a main effect of experiment, $F(1,76) = 4.29$, $p = .042$, $\eta_p^2 = .05$, no effect of age, $F(1,76) = .79$, $p = .378$, $\eta_p^2 = .01$, and no experiment by age interaction, $F(1,76) = .79$, $p = .378$, $\eta_p^2 = .01$. The main effect of experiment resulted because children were more likely to indicate the agent preferred the unattractive object when they were told this object belonged to the agent ($M = .80$), than when they were not given ownership information ($M = .45$). Follow-up t-tests found that when ownership information was not given, 3- and 4-year-olds judged that the agent preferred the unattractive object less than expected by chance (i.e., their scores were less than the chance score of 1), single-sample t-tests, $ps \leq .017$.

These findings suggest that ownership does influence younger children's judgments of people's preferences. When not given ownership information about the objects, children were

more likely to judge that the agent preferred the visibly more attractive object. However, when told that the agent owns the less attractive object, children judged that the agent preferred this object and the visibly attractive object at equal rates. Hence, these findings suggest that ownership reduces the likelihood that children expect people to prefer more attractive objects. It is unclear, though, whether children's preference inferences were influenced by the agent's ownership per se or whether children are swayed by any information relating the agent to an object. The final experiment directly tests whether 3-4-year-olds believe that owning an object increases people's preferences for that object.

Experiment 4: The effect of object-agent relations on preference judgments

Methods

Participants. We tested 80 children: 40 3-year-olds (3;0–3;11, M_{age} = 3;5; 20 boys) and 40 4-year-olds (4;0–4;11, M_{age} = 4;4; 23 boys). An additional 2 3-year-olds were tested but replaced because they did not provide meaningful responses to the test question.

Materials and Procedure. Children were shown the vignettes from Experiments 2 and 3 (a girl and two wagons in story 1, and a boy and two toy cars in story 2). In one condition, the less attractive object belonged to the agent; in the other condition, the less attractive object belonged to the agent's neighbor. The attractive object always belonged to someone else. After hearing each story, children were asked which object the agent liked more.

Results and Discussion

Children were scored 1 each time they inferred the agent likes the unattractive object more, and were scored 0 each time they indicated the attractive object.

A 2 (age in years: 3, 4) x 2 (owner: agent, neighbor) ANOVA revealed no significant effects, $p \geq .782$. We also found that children indicated that the agent preferred the less attractive object at chance rates, $p = .206$.

These findings suggest that children do not believe that owning an object increases one's preference for it. Together with the findings from Experiment 3, it appears that children's inferences of agents' preferences are influenced by information about ownership. However, children are no more influenced by information that the agent owns the object than by information that someone connected with the agent owns it. Such findings raise the possibility that we would see similar effects if children were told other information connecting the agent to the object.

General Discussion

Our findings are informative about the development of children's ability to consider ownership when predicting people's actions. The findings are also informative about how ownership affects children's inferences of people's preferences.

Using Ownership to Predict Actions

In the first two experiments, children predicted which of two objects an agent would take. In the first experiment, one object was preferred by the agent and either belonged to the agent or to someone else, while the other object was not preferred and unowned. Children considered ownership, and were more likely to predict that the agent would take the preferred object when it belonged to the agent compared with when it belonged to someone else. In the second experiment, one object belonged to the agent, while the other object was visibly more attractive and belonged to another person. From age 4, children predicted that agents would be more likely

to take their own property instead of someone else's, and from age 5, they predicted this while acknowledging that the agent preferred someone else's more attractive object.

These findings are the first to show that children use ownership to predict how people will act. Previous studies examined children's understanding of the consequences of ownership, including ownership rights (e.g., Kim & Kalish, 2009; Neary & Friedman, 2014; Rossano et al., 2011), and one other study investigated whether older children use ownership to make other types of predictions (i.e., who will win conflicts over property; Pietraszewski & Shaw, 2015). As such, the present findings contribute to our understanding of the inferences that children make from ownership, and the factors they consider when predicting people's actions.

Ownership Influences Preference Judgments

Our findings show that ownership also influences children's inferences of people's preferences. In the second and third experiments, children judged whether an agent preferred a visually more attractive object over another object. Children's judgments varied depending on whether they were told that the agent owned the less attractive object (Experiment 2) or were not told about ownership (Experiment 3). Children aged 3 and 4 were only able to acknowledge that the agent preferred the more attractive object when they were not told about ownership. It is important to note, though, that our findings do not show that children expect owners to prefer their own property (i.e., ownership did not result in children judging that the agent preferred the less attractive object). Instead, ownership reduced the likelihood of children inferring the agent preferred the more attractive object. Put differently, ownership counteracted the attractiveness of the object. However, the findings of Experiment 4 suggest that children are no more influenced by information that the agent owns the object than by information that someone connected with the agent owns it.

The current findings are consistent with other research showing that children do not expect owners to prefer their property (Gelman & Davidson, 2016; Gelman et al., 2012). For example, in Gelman et al. (2012, Experiment 2), 2- and 3-year-olds indicated that they preferred a toy that belonging to them, but they did not assume that the researcher preferred her own toy (except when the researcher's toy was visibly more attractive than the child's).

Expectation to Respect Ownership when Preferences Conflict

Our findings are also informative about whether children expect agents to uphold ownership, even when they prefer someone else's property. In Experiment 1, when the preferred object belonged to another person, children predicted that the agent would take the preferred object and less preferred object at similar rates. This finding is broadly consistent with research showing that at age 5, children do not reliably predict people's actions from rules or preferences when these factors conflict (Bernard et al., 2016, Experiment 1; Kalish & Shiverick, 2004, Experiment 2). However, in Experiment 2, which used simpler methods, we found that children expect people to respect ownership—at age 4, they predicted that the agent would take their own object instead of a more attractive object belonging to someone else.

This finding is striking given that previous research shows that children and adults use rules and preferences at similar rates when predicting actions (Kalish & Shiverick, 2004, Experiment 2), and that it is only at age 7 that children predict people will act according to moral rules over desires when these factors conflict (Lagattuta et al., 2010). Future research could explore which factors caused the discrepancy between our findings and previous findings, and whether these differences stem from low-level methodological differences between the studies, or from more substantive differences.

Developmental Differences in Action Predictions

Our findings also reveal development in children's ability to predict people's actions from ownership when they prefer someone else's property. In Experiment 2, 4- and 5-year-olds but not 3-year-olds, predicted that the agents would take their own property instead of someone else's. One possible explanation for these age-related improvements in children's ability to use ownership to predict actions is developmental changes in inhibitory processes. Executive function skills develop during the preschool years and improvements in inhibitory control underlie performance improvements on many tasks (e.g., Carlson, Moses, & Breton, 2002; Carlson, White, & Davis-Unger, 2014). As such, it is possible that older children performed better than younger children because they were able to inhibit their desire for the attractive object. When there were salient differences between the two objects (Experiment 2), younger children likely preferred the more attractive object and may have had more difficulty inhibiting this preference when making their prediction.

Another possibility is that children's reliance on mental-state reasoning may decrease with age. According to this account, younger preschoolers may rely on people's desires and preferences (and other mental states) when predicting how they will act, while older preschoolers may give less priority to these factors. Giving less priority to mental states, could allow older children to consider other factors, such as social or deontic information. Similarly, the developmental differences could arise from an increase in ownership understanding. In the preschool years, there is development in children's understanding of ownership and its consequences (Blake et al., 2012; Blake & Harris, 2009; Gelman et al., 2012; Kim & Kalish, 2009; Neary, Friedman, & Burnstein, 2009; Rossano et al., 2011). For example, 5-year-olds but not 3-year-olds, frequently reference ownership when explaining why it is acceptable (or unacceptable) for a person to use an object (Nancekivell & Friedman, 2014). As such, an

increased understanding of ownership could have made it easier for older children to accurately predict the actions of others.

Chapter Four: Children consider diverse histories and object-type when judging which objects are special (Paper Three)

A version of this paper is published:
Pesowski, M.L. & Friedman, O. (in press). Children value objects with distinctive histories. *Journal of Experimental Psychology: General.*

Children view certain objects as more special than others. Recent research shows that children view objects as special if they have been in contact with famous people, and this is reflected in their social and monetary evaluations. At age 4, children judge that objects owned by famous people belong in museums and are worth more than identical-looking objects owned by non-famous people (Frazier & Gelman, 2009; Gelman, Frazier, Noles, Manczak, & Stilwell, 2015; also see Hood & Bloom, 2008). For example, children judge that a rubber duck belonging to Ernie from Sesame Street belongs in a museum, but that a similar duck belonging to an experimenter's father does not (Frazier & Gelman, 2009). Adults respond similarly when evaluating objects possessed by famous people (e.g., Frazier & Gelman, 2009; Frazier, Gelman, Wilson, & Hood, 2009; Gelman et al., 2015).

Children's beliefs that famous people's possessions are special may depend on physical contact. For example, 6-year-olds judge that a spoon belonging to the Queen is worth more money than a duplicate spoon the Queen never owned and therefore never touched (Hood & Bloom, 2008; for related findings from adults see Newman & Bloom, 2014 and Newman, Diesendruck, & Bloom, 2011). Such judgments may stem from psychological essentialism and a belief in "contagion" or "sympathetic magic" (see Nemeroff & Rozin 1994, 2000). Children may believe that when a famous person touches or uses an object, some of their *essence* is transferred to the object, making it special and increasing its value (Gelman et al., 2015; also see Gelman & Hirschfield, 1999; Nemeroff & Rozin, 1994, 2000; Newman & Bloom, 2014; Newman,

Diesendruck, & Bloom, 2011; Rozin, Millman, & Nemeroff, 1986; Rozin, Nemeroff, Wane, & Sherrod, 1989). On this view, children think that Ernie's rubber duck is special because it has his essence (Frazier & Gelman, 2009; Gelman et al., 2015).

However, some objects are special for reasons other than contagion. Consider a pot from ancient Greece or the very first light bulb. Adults judge that these objects are more likely to belong in museums and are worth more than similar-looking objects (e.g., a lemonade pitcher, regular light bulb). Adults also claim they would rather keep, own, and touch these historical items than similar-looking ones (Frazier et al., 2009; also see Gjersoe, Newman, Chituc, & Hood, 2014 for cross-cultural data). These judgments are unlikely to reflect beliefs in contagion. The pot from ancient Greece is not special because a particular person used or touched it, and transferred their essence to it. Instead, the pot may be special because it has an interesting history—it is from a distant time and location. Likewise, the very first light bulb is special because it has a distinctive role in history, and not because Thomas Edison touched it (i.e., he also touched many other light bulbs). Such examples suggest that adults view some objects as special because they have distinct histories or historical roles.

In this paper, we investigate whether children think that distinctive histories, aside from contagion, make objects special. For example, we test whether children view objects as special if they are from interesting locations (e.g., a castle) or are created or acquired in interesting ways (e.g., made by a robot, won as a prize). Judgments that objects with distinctive histories are special have wide ranging implications for understanding how objects are viewed and treated. For instance, adults display objects in museums or galleries, take the time and money to visit such spaces, and react when special objects are mistreated, lost, or destroyed. However, little is known about the origin or development of these judgments, other than the limited case of objects

belonging to famous individuals. Investigating how these judgements develop will increase our understanding of factors that affect how children evaluate objects, and ways they consider history in their judgments (Gelman et al., 2012; Nancekivell & Friedman, 2014).

At present, no studies have examined how children evaluate objects that were created or acquired in interesting ways or from interesting locations. Some research has investigated children's judgments of original creations, like the very first Candy Land game (Frazier & Gelman, 2009; Gelman et al., 2015), but found mixed evidence regarding whether children believe these objects are special. By age 5, children judge that original creations belong in museums (Frazier & Gelman, 2009), but it is not until age 11 that they view original creations as worth more than similar-looking objects (Gelman et al., 2015).

Some research suggests children sometimes view possessions they have owned for a long time (a type of distinctive history) as special. However, these findings do not conclusively show that children consider history when judging whether objects are special. In one study, 3-year-olds preferred their old and visibly-used stuffed animals, dolls, and action figures to new replacements, but did not show this preference for other types of toys (Gelman & Davidson, 2016). However, these children could have preferred their stuffed animals and dolls for their familiar physical features. Consistent with this, many children are willing to trade their old toys for physically-identical duplicates (Hood & Bloom, 2008). Furthermore, children with attachment objects know that they have possessed these objects since they were babies but do not refer to this history when explaining why these objects are special. Instead, children refer to the objects' features (e.g., texture, cuddliness, color; Lehman, Arnold, & Reeves, 1995) or their own feelings (e.g., "because I love it"; Dyl & Wapner, 1996, p. 372). Given children's inconsistent

sensitivity to distinctive histories, it remains possible that physical contact with a famous person is the only form of history they consider when judging whether an object is special.

The Current Experiments

We investigate whether children judge that objects with diverse distinctive histories are special. We examine whether children view objects as special when they are from interesting locations or are created or acquired in interesting ways. Although some studies have investigated how children view original creations (Frazier & Gelman, 2009; Gelman et al., 2015), we revisit their conceptions of these objects, and also examine how children view original acquisitions (e.g., the first baseball a child ever had). If children are more likely to view objects as special when they have these distinctive histories, rather than mundane ones, this will show that children's judgments may not be rooted in psychological essentialism and beliefs in contagion.

We also investigate whether children's sensitivity to distinctive histories depends on the type of object—specifically whether children's judgments differs for stuffed animals compared with other objects. As noted above, some findings suggest that children may be especially likely to link history with specialness for stuffed animals (Gelman & Davidson, 2016; also see Lehman et al., 1995). However, children might consider distinctive histories *less* for stuffed animals than other objects. Children often view stuffed animals as akin to friends. For example, they expect others to love stuffed animals and feel safe when hugging them (Aguiar & Taylor, 2015), as one might feel with a close friend. Children, though, do not typically value friends for their distinctive histories. Instead, 4-5-year-olds claim that shared activities (e.g., playing together) and physical features (e.g., hair color) are important characteristics of friends, while 6-7-year-olds identify more abstract factors, such as support and affection (Furman & Bierman, 1983).

Viewing stuffed animals as akin to friends might therefore lead children to feel they are special regardless of whether they have distinctive histories.

We conducted four experiments. In each experiment, 4-7-year-olds were shown pairs of objects and were asked to indicate which object is *special.* We asked this because both researchers and children often use "special" to characterize objects that are valued for their distinctive histories or properties (Dyl & Wapner, 1996; Frazier & Gelman, 2009; Gelman et al., 2015; Hood & Bloom, 2008). For example, children sometimes use "special" to explain what belongs in a museum (e.g., "a place where you get to see special stuff that is very fragile and special and amazing"; Frazier & Gelman, 2009, p. 288). The word "special" has also been used in scripts, instructions, and test questions in research on children's sensitivity to object histories (Dyl & Wapner, 1996; Hood & Bloom, 2008; Lehman et al., 1995), and in developmental research on other topics (e.g., Barrett, Richert, & Driesenga, 2001; Childers, & Tomasello, 2003; Corriveau, Chen, & Harris, 2015; Gelman & Bloom, 2000; Gelman, Martinez, Davidson, & Noles, 2018; Hollander, Gelman, & Star, 2002; Johnson & Harris, 1994; Kushnir & Gopnik, 2005; Kushnir, Wellman, & Gelman, 2008; Mills, Legare, Bills, & Mejias, 2010; Nguyen, 2012; Sobel & Corriveau, 2010; Svetlova, Nichols, & Brownell, 2010; Watson, Gelman, & Wellman, 1998; Waxman & Booth, 2000; Wellman, & Miller, 1986). Given all of this, we felt that asking about "special" would be the most straightforward way of examining whether children consider distinctive histories when evaluating objects.

Experiment 1: Do children use distinctive histories to judge which objects are special?

Methods

Participants. We tested 80 children: 40 4-5-year-olds (M_{age} = 5;0 [years; months], range = 4;4-5;11, 19 males; henceforth referred to as younger children), and 40 6-7-year-olds (M_{age} =

6;8, range = 6;0-7;8, 20 males; henceforth referred to as older children). In all experiments, children were tested in their schools in the Kitchener-Waterloo region. In this region, approximately 85% of residents are Caucasian; the largest visible minority groups are of Chinese and South Asian descent. Different children were tested in each experiment.

Materials and Procedure. In this experiment, and those subsequent, all materials were shown on a laptop computer. In each of eight trials, children were shown a pair of objects. Each trial showed different kinds of objects (e.g., hammers, vases), but the objects in each trial looked identical. Children were told that one object in the pair was new, and were told a fact about the other object's history. This fact either specified an interesting way the object was *created* (e.g., made by a robot), an interesting *location* the object was from (e.g., from a castle), that the object was an *original creation* (e.g., the very first hammer), or a mundane detail about its history (e.g., from a store). Each history type was featured in two of the eight trials. At the end of each trial, children were asked which object in the pair was more special (e.g., "Which hammer is more special?"). Table 2 shows the scripts and objects used for all experiments.

Table 2

Objects and sample scripts used in each experiment

	Experiment 1	Experiment 2	Experiments 3 & 4
Sample script	Look, here are two flutes. This flute is from a castle. This flute is new. *Which flute is more special?*	Here are two umbrellas. Jesse won this umbrella as a prize. This umbrella is new. *Which umbrella is more special to Jesse?*	This is Sam. And look! Here are two elephants. These two elephants belong to Sam. This is the very first elephant Sam ever had. This elephant is new. *Which elephant is more special to Sam?*
Objects	flutes, bowls, hammers, lamps, nets, vases, spoons, balls	keychains, piggy banks, baseballs, pencil cases, flashlights, water bottles, picture frames, umbrellas	keychains, baseballs, pencil cases, umbrellas, piggy banks (Exp. 3 only), key chains (Exp. 4 only); various stuffed animals.
Distinctive histories	<u>Interesting location</u> This [x] is from a castle. This [x] is from a spaceship. <u>Interesting creation</u> This [x] was made by a robot. This [x] took a month to make. <u>Original creation</u> This is the very first [x]. This is the very first [x].	<u>Interesting location</u> Jesse got this [x] on vacation in Hawaii. Jesse got this [x] on a trip to a farm. <u>Interesting acquisition</u> Jesse won this [x] as a prize. Jesse got this [x] as a present. <u>Original acquisition</u> This is the first [x] Jesse ever had. This is the first [x] Jesse ever used.	<u>Interesting location/acquisition (Exp. 3)</u> Sam won this [x] as a prize. Sam got this [x] on a trip to a farm. <u>Original acquisition (Exp. 4)</u> This is the first [x] Sam ever had. This is the first [x] Sam ever had.
Mundane histories	This [x] is from a store. This [x] is from a school.	Jesse bought this [x] at a store last week. Jesse got this [x] at school last week.	Sam bought this [x] at a store last week. Sam got this [x] at school last week.

In this experiment, and those subsequent, the pairs of objects were presented in a fixed order. However, the order of the history types was counterbalanced across participants (i.e., children heard the histories presented in one of four orders). Whether the object with the history was on the right or left was counterbalanced across participants. The object on the left was always introduced first.

By comparing objects with different histories to new objects, this design allows us to examine whether children view objects with different distinctive histories as more special than those with mundane histories. It is important to note though, that our interest is not in whether children choose objects with histories more than new objects. Findings from previous studies suggest that young children are often attracted to new objects over old ones, and expect others to have this preference (Frazier & Gelman, 2009; Gelman & Davidson, 2016). Given the draw of new objects, any choices of old objects will show that children believe that histories make objects special.

Results and Discussion

Children indicated one of the objects from each pair in all trials, except for 3 trials in which children said "Both". We examined how often children indicated the object with a historical fact (as opposed to giving any other response) using a Generalized Estimating Equations (GEE) binary logistic model, with the within-subject factor of History type (interesting-location, interesting-creation, original-creation, mundane), and the between-subject factor of Age group (younger vs. older); see Figure 10. This analysis revealed a main effect of History type, $Wald\ X^2\ (3) = 20.37$, $p < .001$, a marginal effect of Age group, $Wald\ X^2\ (1) = 3.03$, $p = .082$, and a marginal interaction between Age group and History type, $Wald\ X^2\ (3) = 7.12$, $p = .068$. See Table 3 for the means and standard deviations in all experiments.

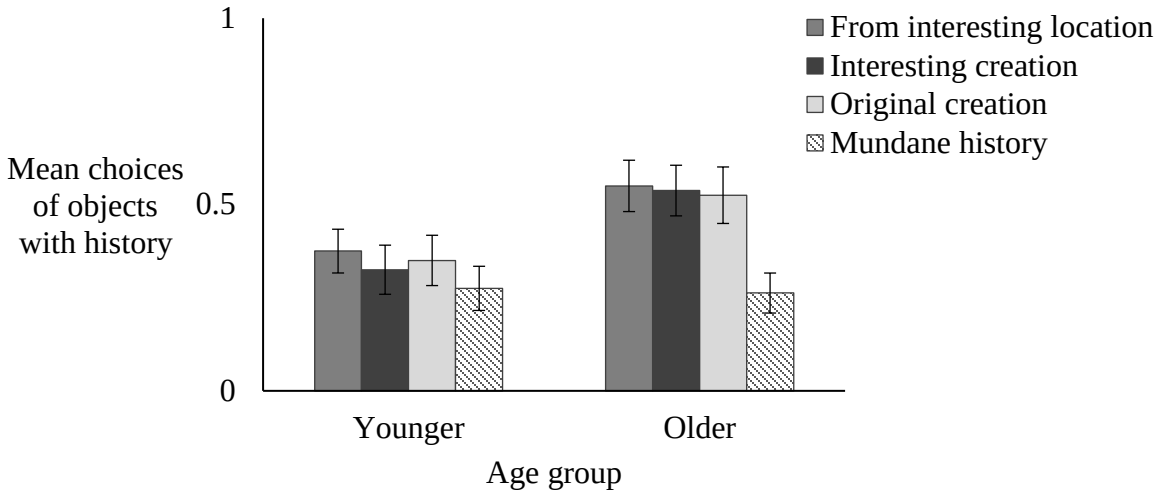


Figure 10. *Experiment 1.* Mean proportion of trials in which children indicated the object with history. Error bars show ± 1 standard errors of the means.

The main effect of History type resulted because choices of older objects were more common in trials with each distinctive history (interesting-location, interesting-creation, original-creation) than in trials where older objects had a mundane history, all *p*s < .002 (comparisons used Bonferroni correction).

Follow-up pairwise comparisons found that the marginally significant interaction between Age group and History type resulted because older children differentiated between distinctive histories and mundane ones, *p*s ≤ .002, but younger children did not, *p*s ≥ .632. As can be seen in Figure 10, older children were more likely to choose an object with a historical fact rather than a new object when the older objects' history was distinctive compared with mundane.

Single-sample tests showed that younger children mostly chose new objects over older objects (i.e., their scores were less than the chance score of 1): interesting-location, $p = .039$, interesting-creation, $p = .014$, original-creation, $p = .035$, and mundane, $p = .001$. In contrast, older children responded at chance when choosing between new objects and objects with

distinctive histories, all *p*s ≥ .465, but mostly chose new objects over objects with mundane histories, $p < .001$.

Table 3

Mean proportion of responses in which younger and older children chose the old object over the new one in each condition, with standard deviations in parentheses.

Study	History type	4-5-year-olds	6-7-year-olds
Experiment 1	Interesting location	.38 (.37)	.55 (.44)
	Interesting creation	.33 (.42)	.54 (.43)
	Original creation	.35 (.43)	.53 (.48)
	Mundane history	.28 (.37)	.26 (.34)
Experiment 2	Interesting acquisition	.59 (.45)	.78 (.39)
	Interesting location	.43 (.45)	.66 (.44)
	Original acquisition	.38 (.45)	.56 (.47)
	Mundane history	.31 (.42)	.46 (.46)
Experiment 3	Distinctive history, common object	.50 (.43)	.70 (.41)
	Mundane history, common object	.30 (.41)	.33 (.44)
	Distinctive history, stuffed animal	.45 (.39)	.63 (.39)
	Mundane history, stuffed animal	.43 (.37)	.48 (.38)
Experiment 4	Original acquisition, common object	.48 (.47)	.65 (.46)
	Mundane history, common object	.30 (.38)	.33 (.37)
	Original acquisition, stuffed animal	.43 (.44)	.58 (.47)
	Mundane history, stuffed animal	.35 (.40)	.55 (.43)

These findings show that older children consider distinctive histories when judging which objects are special. They were more likely to judge that objects were special if the objects were

from interesting locations, were created in interesting ways, and were original creations, than if the objects had mundane histories. However, we felt that younger children might also use distinctive histories in this way if they considered a slightly different form of specialness.

In the present experiment, children did not have to think about a *particular* person finding the object special. But children's understanding that distinctive histories make objects special may begin with an awareness of past experiences that made their own possessions special (e.g., getting a souvenir on a vacation). As such, in the next experiments, we ask children about which objects are special to a particular person (e.g., "Which keychain is more special to Jesse?"), and provide histories that describe experiences connecting the person to the object (e.g., "Jesse got this keychain on vacation in Hawaii").

Experiment 2: Do children use distinctive histories to judge which objects are special to a particular person?

Methods

Participants. We tested 80 children: 40 4-5-year-olds (M_{age} = 5;1, range = 4;0-5;11, 19 males), and 40 6-7-year-olds (M_{age} = 6;8, range = 6;0-7;9, 24 males).

Materials and Procedure. Children were first shown a picture of a child named Jesse (gender matched to the participant). Then, in each of eight trials, children were shown a pair of identical-looking objects. As before, each trial showed different kinds of objects; however, the objects in this experiment were more likely to be owned by children, such as keychains and baseballs. Children were told that one object in the pair was new, and were told a fact about the other object's history. This fact either specified a distinctive way that Jesse *acquired* the object (e.g., won as a prize), an interesting *location* where Jesse acquired it (e.g., on vacation in Hawaii), that it was an object *originally* acquired or used by Jesse (e.g., the first keychain Jesse

ever had), or some *mundane* method of acquisition (e.g., Jesse bought this keychain at a store last week). Each history type was featured in two of the eight trials. At the end of each trial, children were asked which object in the pair was more special to Jesse (e.g., "Which keychain is more special to Jesse?").

Results and Discussion

Children chose one of the objects from each pair in all trials, except for 5 trials in which children said "Both", and 1 trial where a child said "I don't know". We examined how often children indicated the object with a historical fact (as opposed to giving any other response) with a GEE model, with the within-subject factor of History type (interesting-acquisition, interesting-location, original-acquisition, mundane), and the between-subject factor of Age group (younger vs. older); see Figure 11. This analysis revealed a main effect of History type, *Wald* X^2 (3) = 37.93, $p < .001$, a main effect of Age group, *Wald* X^2 (1) = 5.49, $p = .019$, but no interaction between History type and Age group, *Wald* X^2 (3) = .740, $p = .864$.

The main effect of History type resulted because children were more likely to judge that interesting-acquisition and interesting-location objects were special than to judge that objects with mundane histories were special, $p < .001$ and $p = .009$ respectively (comparisons used Bonferroni correction). However, children were not more likely to judge that original-acquisition objects were more special than objects with mundane histories, $p = .719$. The main effect of Age group resulted because older children, compared to younger children, were more likely to place greater value on objects with histories relative to new objects, $p = .016$.

Single-sample tests showed that younger children responded at chance when choosing between new objects and interesting-acquisition and interesting-location objects, ps $\geq .224$, and they mostly chose new objects over objects with mundane histories, $p = .01$, and originally-

acquired objects, albeit only marginally, $p = .088$. Older children chose interesting-location and interesting-acquisition objects over new objects, $p = .030$ and $p < .001$ respectively, but responded at chance when choosing between new objects and original-acquisition objects and objects with mundane histories, ps $\geq .399$.

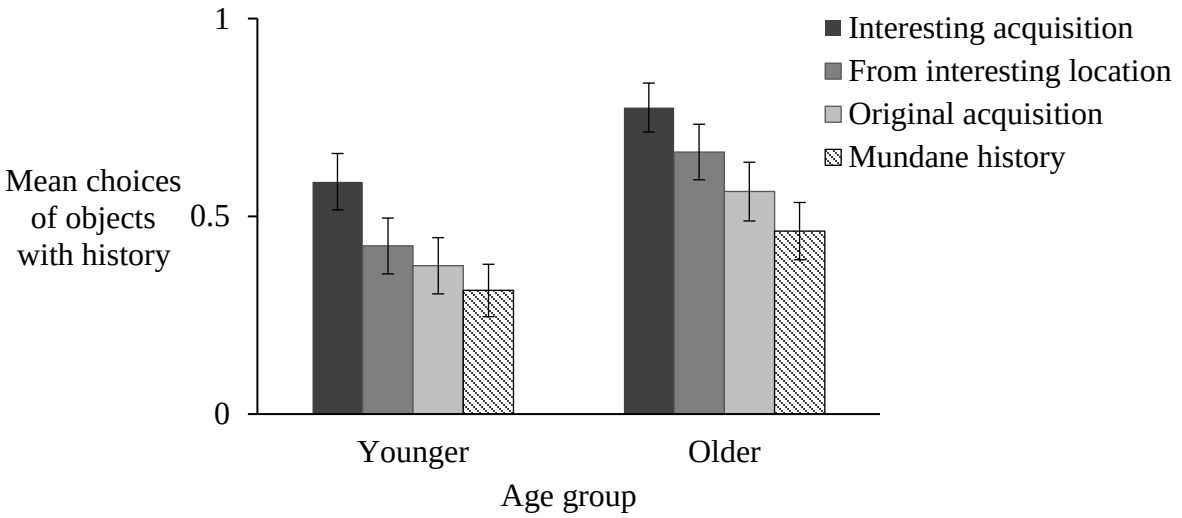


Figure 11. *Experiment 2.* Mean proportion of trials in which children indicated the object with history. Error bars show ± 1 standard errors of the means.

These findings show that children use distinctive histories to judge which objects are special to a specific child. Children in both age groups were more likely to judge that objects were special if they were acquired in interesting ways or were from interesting locations than if they had mundane histories.

The next experiments examine our second major research question, and investigate whether children's use of distinctive history differs for judgments about stuffed animals. To focus on this question, the next experiment uses fewer trials and examines the histories children believe make objects special to an individual—histories in which objects are from interesting locations and were acquired in interesting ways.

Experiment 3: Does children's use of distinctive histories differ for stuffed animals?

Methods

Participants. We tested 80 children: 40 4-5-year-olds (M_{age} = 4;9, range = 4;0-5;11, 19 males), and 40 6-7-year-olds (M_{age} = 7;0, range = 6;1-7;11, 19 males).

Materials and Procedure. Children completed four trials in one of two between-subject conditions. In each trial, they saw a picture of two identical objects. In one condition, the objects were common objects (e.g., baseballs, pencil cases), and in the other condition, they were stuffed animals (e.g., stuffed elephants, stuffed dogs). The objects were shown with a picture of a child who was described as owning the objects. A different owner appeared in each trial, as we felt it might seem odd for a single child to own all the stuffed animals in the condition featuring these items. Children were told that one object in each pair was new, and were told a fact about the other object's history. In two of the four trials, these facts specified a *distinctive* detail about the object's history—one fact described an interesting way the agent acquired the object (i.e., won as a prize), and the other described an interesting location where the agent acquired it (i.e., from a trip to a farm). In the other two trials, this fact described a *mundane* detail about how and where it was acquired (e.g., was bought at a store last week). After children were told about each object in the pair, they were asked which object was more special to the owner (e.g., "Which elephant is more special to Sam?"). See Figure 12 for sample slides.

Figure 12. *Experiments 3 and 4.* Sample slide from the stuffed animal condition (left image) and the common object condition (right image). The grey squares were not in the actual stimuli, but are included here to occlude faces.

Results and Discussion

Children chose one of the objects from each pair in all trials, except for 4 trials in which children said "Both". We examined how often children indicated the object with a historical fact (as opposed to giving any other response) with a GEE model, with the within-subject factor of History type (distinctive vs. mundane), and the between-subject factors of Object type (stuffed animals vs. common objects) and Age group (younger vs. older); see Figure 13. This analysis revealed a main effect of History type, *Wald* X^2 (1) = 14.78, $p < .001$, and a significant interaction between Object type and History type, *Wald* X^2 (1) = 4.04, $p = .036$. No other main effects or interactions were significant, ps > .129.

Follow-up pairwise comparisons found that the interaction between Object type and History type resulted because children were only sensitive to the type of history when judging which common objects were special, $p < .001$, and not when judging which stuffed animals were special, $p = .134$ (comparisons used Bonferroni correction). For common objects, choices of older objects were more common in trials where objects had a distinctive history than in trials where they had a mundane history.

Single-sample tests showed that younger children were equally likely to choose new common objects and common objects with distinctive histories, $p > .999$, but were more likely to

choose new common objects over ones with mundane histories, $p = .047$. Older children mostly chose common objects with distinctive histories over new common objects, $p = .047$, and trended towards mostly choosing new common objects over ones with mundane histories, $p = .093$. In contrast, younger and older children were equally likely to choose new stuffed animals and ones with distinctive histories, $p = .563$ and $p = .162$ respectively, and ones with mundane histories, $p = .363$ and $p = .763$ respectively.

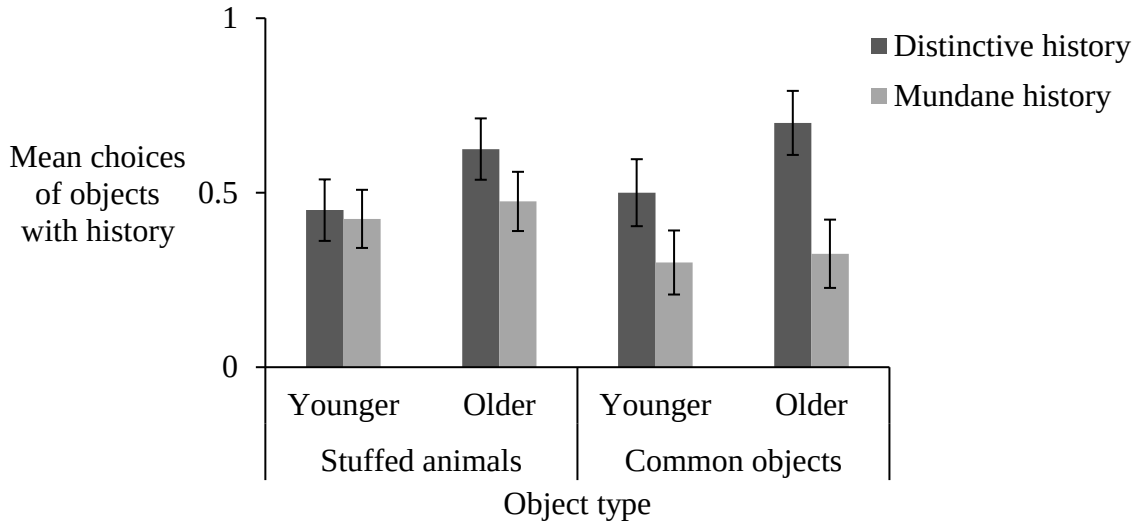


Figure 13. *Experiment 3.* Mean proportion of trials in which children indicated the object with history. Error bars show ± 1 standard errors of the means.

These findings show that children use distinctive histories when judging which common objects are special, but not when judging which stuffed animals are special. However, we wondered whether we might see the *opposite* pattern if we asked children about original acquisitions, like the first teddy bear ever owned by a child. This prediction stems from previous findings suggesting that particular histories, such as owning the object for a long time, may be especially important for these objects (Gelman & Davidson, 2016; Lehman et al, 1995). Therefore, although children in Experiment 2 did not appreciate that original-acquisition objects

are special to the owner, children could be more likely to appreciate this history when considering stuffed animals. We investigated this possibility in our final experiment.

Experiment 4: Does children's use of original-acquisition depend on object type?

Methods

Participants. We tested 80 children: 40 4-5-year-olds (M_{age} = 4;9, range = 4;0-5;10, 16 males), and 40 6-7-year-olds (M_{age} = 7;0, range = 6;1-7;11, 21 males).

Materials and Procedure. The procedure was identical to that in Experiment 3, except for two differences. First, the distinctive histories in this experiment (2 trials) specified that the object was an original-acquisition for the owner (e.g., "This is the very first teddy bear Jesse ever had"). Second, a pair of keychains replaced the pair of piggy banks in the common object condition to ensure that the common objects condition did not include items that resembled a stuffed animal. As in the previous experiments, children were asked to judge which object in each pair was more special to the agent. See Figure 12 for sample slides.

Results and Discussion

Children chose one of the objects from each pair in all trials. We examined how often children indicated the object with a historical fact with a GEE model, with the within-subject factor of History type (original-acquisition vs. mundane), and the between-subject factors of Object type (stuffed animals vs. common objects) and Age group (younger vs. older); see Figure 14. This analysis revealed a main effect of History type, *Wald* X^2 (1) = 8.80, p = .003, a marginal effect of Age group, *Wald* X^2 (1) = 2.81, p = .094, and a significant interaction between Object type and History type, *Wald* X^2 (1) = 3.92, p = .048. No other main effects or interactions were significant, ps > .335.

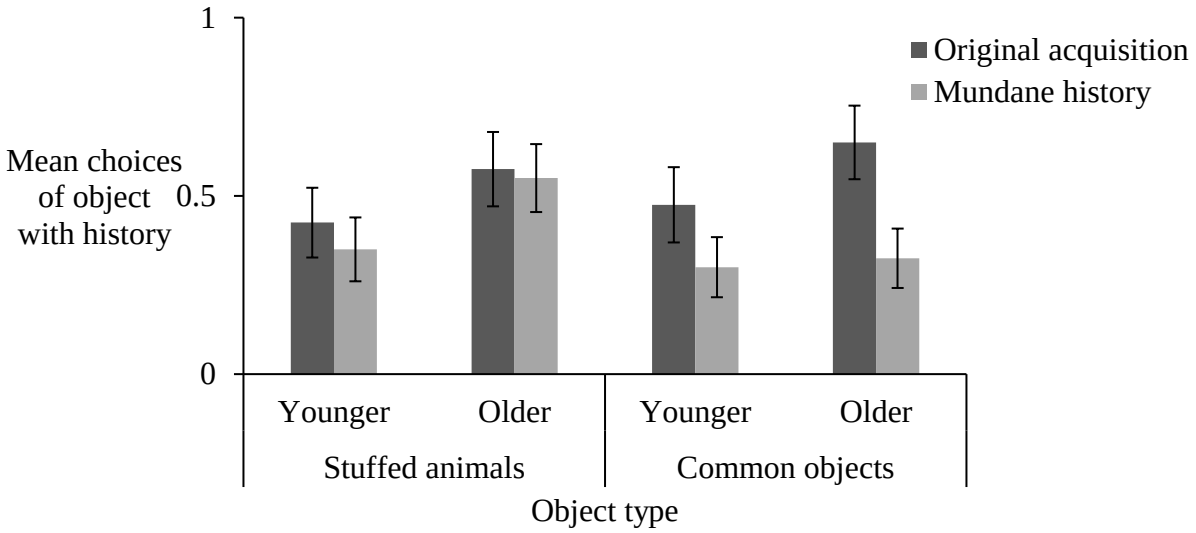


Figure 14. *Experiment 4.* Mean proportion of trials in which children indicated the object with history. Error bars show ± 1 standard errors of the means.

Follow-up pairwise comparisons found that the interaction between Object type and History type resulted because children were only sensitive to the type of history when judging which common objects were special, $p < .001$, and not when judging which stuffed animals were special, $p = .514$ (comparisons used Bonferroni correction). For common objects, choices of older objects were more prevalent in trials where the object was an original-acquisition than in trials where the older objects had a mundane history.

Single-sample tests showed that younger and older children mostly chose new common objects over ones with mundane histories, $p = .030$ and $p = .048$ respectively, but were equally likely to choose new common objects and original-acquisition objects, $p = .808$ and $p = .162$ respectively. Younger and older children responded at chance when choosing between new stuffed animals and those that were originally acquired, $p = .439$ and $p = .468$, and had mundane histories, $p = .107$ and $p = .593$. These findings replicate the results from Experiment 3 and show that children do not consider distinctive histories to judge which stuffed animals are special.

General Discussion

Our findings show that children consider diverse historical factors when judging which objects are special. In these judgments, children considered where objects were from, and how they were created and acquired. They also considered whether objects were original creations or acquisitions, though we only found this in the first and fourth experiments, but not in the second. Also, children's sensitivity to distinctive histories depended on the type of object. Children were sensitive to the histories of common objects, but not the histories of stuffed animals.

These findings contribute to our knowledge about which histories make objects special for children, as previous research has mostly focused on objects with two kinds of distinctive histories—original creations and famous people's possessions (Frazier & Gelman, 2009; Gelman et al., 2015; Hood & Bloom, 2008). Our findings also suggest that children's judgments that objects are special do not just depend on psychological essentialism and beliefs in contagion. In our studies, the objects with distinctive histories were not touched, used, or owned by famous people, so it is unlikely that children judged that objects are special because of physical contact with a valued person.

Why then do children view objects with distinctive histories as special? Children might understand that these objects can act as reminders of important events people have experienced and interesting places they have been. For example, children may understand that a keychain from a vacation to Hawaii is special because it is a reminder of the vacation and the experiences associated with it (for related findings see Lagattuta & Wellman, 2001; Lagattuta, Wellman, & Flavell, 1997). Additionally, children might believe that objects with distinctive histories provide a physical connection to interesting places and times, even if one has never directly experienced

them (Belk, 1988; Candlin, 2017). Children may believe that a pot from Ancient Greece is special to many people because it gives them a physical connection to a valued place and time.

Alternatively, a revised essentialist account might explain why children view objects with distinctive histories as special. One could suggest that the objects with distinctive histories had taken on essences, though not the essences of famous people. For example, one could posit that a keychain from Hawaii is special because the Hawaiian Islands have their own essences. On this view then, our findings have a slightly different significance—they may show that children do not just ascribe essences to individual people, but also to places like Hawaii, locations like spaceships, and events like taking-a-month-to-create (for a related discussion see Belk, 1988.)

Development

Our findings also reveal development in how children judge which objects are special. Although 4-5-year-olds used distinctive histories to judge which common objects are special in the second, third, and fourth experiments, they did not do so in the first experiment. The key difference between these experiments is that only the later experiments involved distinctive histories that connected the person to the object (e.g., "Jesse got this keychain on vacation in Hawaii"). In the first experiment, the histories only mentioned the object (e.g., "This hammer is from a castle").

This developmental difference might give us insight into the mechanisms underlying children's judgments of specialness. Children may initially understand that objects are special because they act as reminders of personal events and experiences, and only later come to understand that objects are special because they provide a physical connection to past events and places for people who never experienced or visited them. Although more research is needed, this explanation fits well with the possibility that children's understanding of what makes objects

special begins with an awareness of past experiences that made their own possessions special (e.g., getting a souvenir on a vacation). However, as we later discuss, our findings suggest that if personal experience does underlie children's sensitivity to history, it is experience with common objects, and not with stuffed animals.

Our developmental findings also help us address a potential concern. One could worry that children's understanding of the word "special" changes with age. If children's understanding of our test question differed by age, it would be difficult to interpret our results. However, our findings cast doubt on this concern, as we observed no significant interactions involving age. The most consistent effect of age was that older children were less likely than younger ones to choose new objects (significant in Experiment 2, and marginally significant in Experiments 1 and 4). As such, our findings may reveal an age-related decrease in the extent to which new objects are viewed as special.

Children's Use of Distinctive Histories Depends on Object Type

Our findings also show that children's use of distinctive histories depends on the nature of the objects they consider. Children used distinctive histories when judging which common objects are special, but not when considering which stuffed animals are special. It may seem surprising that children did not view originally acquired stuffed animals as special (relative to those with mundane histories) as children may be sensitive to similar histories for their own stuffed animals (e.g., Gelman & Davidson, 2016; Lehman et al., 1995). Crucially, we asked children about others' stuffed animals.

It is possible that children neglected the histories for stuffed animals because the agents in our tasks each had two identical-looking stuffed animals. Children might have found this counterintuitive and confusing—although people own identical copies of common objects (e.g.,

identical-looking spoons), they do not typically own identical-looking stuffed animals. Although we cannot conclusively rule out this possibility, we think it is unlikely that children were confused. Our participants were aged 4-7 and have likely seen many duplicates of stuffed animals in retail settings (e.g., Beanie Babies and Beanie Boos). Also, some previous findings show that young children understand that identical stuffed animals can have distinct properties. For example, children understand that a stuffed animal's name and knowledge state does not extend to other identical stuffed animals (Bélanger & Hall, 2006; Gutheil, Gelman, Klein, Michos, & Kelaita, 2008; Hall, Lee, & Bélanger, 2001). Nonetheless, it would be helpful for further studies to investigate whether our findings replicate if children are asked about non-identical stuffed animals.

Children may have also neglected the distinctive histories of stuffed animals because they value their physical features. This is broadly consistent with how children value friends—children value friends for their present qualities (e.g., physical and social characteristics) rather than their distinctive histories (Furman & Bierman, 1983). Children's attraction to the physical features of stuffed animals might lead them to neglect non-observable features of these objects, like distinctive histories. A similar phenomenon may occur when adults objectify women based on their appearance. For instance, when adults objectify a woman, they disregard her non-obvious features, and view her as less competent, warm, and moral (Heflick & Goldenberg, 2009; Heflick, Goldenberg, Cooper & Puvia, 2011; Loughnan et al., 2010).

Taken together, the current findings show that children consider diverse distinctive histories when evaluating objects, and these evaluations are probably not rooted in beliefs about contagion. Instead, they may stem from an awareness that past experiences made their own possessions special.

Chapter Five: General Conclusions

Major Findings

Chapter Two investigated children's understanding of, and respect for, other people's ownership rights. In three experiments, 2- and 3-year-olds were asked to select resources for themselves and allocate resources to another agent. In the first two experiments, children mostly selected their own resources for themselves and refrained from taking another agent's resources, even when children were able to take as many resources as they wanted. That is, children acted against their desire to take all of the resources for themselves and instead considered ownership. In the third experiment, children did not avoid taking another agent's resources when the only other available resources were described as *not* belonging to the agent. Importantly, 2- and 3-year-olds showed similar respect for others' ownership rights, except in Experiment 2 where 3-year-olds showed greater respect than 2-year-olds. Together, these findings show that children uphold others' ownership rights and understand that ownership constrains their ability to act on their preferences.

Chapter Three investigated how children expect people to act when they prefer someone else's property, and whether ownership influences children's preference inferences. In Experiment 1, 3-6-year-olds were asked to predict whether an agent would take an unowned object or an object that was preferred and either belonged to the agent or to someone else. Here, children at all ages considered ownership but did not expect agents to refrain from acting on their preference for another person's property. In Experiment 2, 3-5-year-olds were shown two objects and asked to either judge which object an agent would take or which object the agent preferred. One object belonged to the agent, and the other object was more attractive but belonged to someone else. This experiment revealed a developmental difference in how children use

ownership to predict people's actions and infer people's preferences: 3-year-olds did not consider ownership and chose randomly between the two objects when predicting people's actions and inferring their preferences; 4-year-olds expected people to respect ownership but did not infer that people prefer more attractive objects belonging to others; 5-year-olds expected people to act according to ownership even when they prefer others' more attractive objects. The findings from Experiments 2, 3, and 4 show that children's preference inferences are influenced by information that connects an agent to an object. Together, these findings suggest that children consider ownership more when predicting people's actions than when inferring people's preferences, and with age expect people to respect ownership even when they prefer someone else's property.

Chapter Four investigated how children use ownership and object history to infer which objects people prefer. In four experiments, children age 4-7 saw pairs of identical-looking objects and judged which one was more special. One object in the pair was new and the other was old and had a history that was either distinctive or mundane. In Experiment 1, the histories did not involve people, and children judged which objects were more special in general; however, in the remaining experiments, the histories were personal (i.e., they connected a person with the object), and children judged which objects were more special to an owner. In Experiment 1, older children's, but not younger children's, judgments were influenced by the type of object history and believed that objects that were from interesting locations, made in interesting ways, and were original creations were more special than objects with mundane histories. In Experiment 2 when the histories were personal, children of all ages were sensitive to whether the objects were from interesting locations or were acquired in interesting ways, but not by whether they were original acquisitions. Experiments 3 and 4 replicated these findings and

also show that children do not consider object histories when judging which stuffed animals are special to an owner. Together, these findings show that children's inferences of which objects are special depend on ownership, object history, and object type.

The findings of my three papers provide a developmental view of how and when children integrate ownership information when reasoning about actions and preferences. In the following sections, I connect the three chapters, note some differences between the findings, discuss potential explanations for these differences, and suggest potential avenues for future research.

Deciding How to Act Vs. Predicting the Actions of Others

The first half of my dissertation examined how ownership influences children's own actions (Chapter 2) and their predictions of others' actions (Chapter 3) when ownership and preferences conflict (see arrows representing relationships 1 and 2 in Figure 1). Previous research has suggested that it is not until age 3 that children understand and uphold the ownership rights of others (Rossano et al., 2011), but it was unclear whether younger children would respect others' ownership and refrain from taking someone else's property when allocating resources. Further, previous research has shown that children consider various factors, including people's mental states (e.g., desires) when predicting people's actions (e.g., Chalik et al., 2014; Wellman & Bartsch, 1988; Wellman & Woolley, 1990), but it was unclear how children expect people to act when they desire someone else's property.

My findings show that children understand that ownership constrains their own ability to act on their preferences before they expect ownership to constrain others' actions. When children allocated resources to themselves and others (Chapter 2), both 2- and 3-year-olds respected others' ownership rights and refrained from acting on their desire to take all of the resources for themselves (a behavior shown in previous research; Rochat et al., 2009; Smith et al., 2013).

However, when children predicted others' actions (Chapter 3), 3-year-olds did not expect people to respect ownership when someone else's property was preferred (although older children did). This latter finding suggests that young children do not reliably use ownership or preferences to predict people's actions when these two factors conflict. This finding, therefore, is consistent with literature suggesting that children do not reliably predict people's actions from rules or preferences when these factors conflict (Bernard et al., 2016, Experiment 1; Kalish & Shiverick, 2004, Experiment 2; see also Lagattuta et al., 2010), but is inconsistent with literature showing that 3-year-olds typically use people's preferences to predict their actions (e.g., Wellman & Bartsch, 1988; Wellman & Woolley, 1990; Woodward, 1998; also see Bartsch & Wellman, 1989).

Together, my findings suggest that children use ownership differently when deciding their own actions and when predicting the actions of others (at least when ownership is pitted against preferences). This difference between children's use of ownership when judging their own and others' actions is similar to the differences children show in their reasoning about fairness when making judgements about their own and others' sharing behaviors; although, the direction of this difference is opposite to the one I found for ownership. That is, young children respect ownership and refrain from acting on their preferences before they expect others to, but expect others to share equally before they themselves do (see Blake et al., 2014 for a discussion of this developmental shift in the fairness domain). Children at age 3, understand the principles of fairness and acknowledge that they should share resources equally with another person (i.e., they endorse equality; for findings suggesting that infants expect others to share equally see Geraci & Surian, 2011; Sloane, Baillargeon, & Premack, 2012; Sommerville, Schmidt, Yun, & Burns, 2013). However, it is not until age 7 that children actually share their resources equally

(Smith et al., 2013). This dissertation, therefore, extends our knowledge by providing evidence that children also demonstrate a knowledge-behavior gap in their reasoning about ownership.

I consider two possible explanations for why ownership appears to affect 3-year-olds' ability to act on their preferences but not their predictions of other people's actions. One explanation highlights the differences between how preferences were pitted against ownership in Chapters 2 and 3. When children allocated resources, they only considered similarly-attractive objects (e.g., square foam shapes), and had to refrain from acting on their desire to take all of the resources for themselves (i.e., a preference for *quantity*); in contrast, when children predicted others' actions, they had to consider a more desirable object that belonged to someone else (i.e., a preference for *quality*). As such, it is possible that the observed knowledge-behavior gap is an artifact of these methodological differences between Chapters 2 and 3, and might dissipate if the methods were consistent. For instance, 3-year-olds might fail to respect others' ownership rights when allocating resources if the other agent's resources are more attractive than children's own resources—ownership might not guide children's own actions or their predictions of others' actions if the objects are qualitatively *different*. Alternatively, 3-year-olds might use ownership to predict others' actions when all objects are similarly attractive—ownership might guide children's own actions and their predictions of others' actions if the objects are qualitatively *similar*. The difference between the attractiveness of the objects might affect how children consider ownership given that previous research has shown that children are sensitive to qualitative differences between objects in other situations, like when sharing resources and inferring preferences (e.g., Pesowski et al., 2016; Rochat et al., 2009).

A second explanation is that children may first act according to ownership without having abstract expectations about how ownership limits others' actions with objects. Put

differently, children may gradually develop an understanding of how ownership limits actions. Children might first understand that ownership affects their own ability to act on their preferences, and over time, apply this understanding beyond themselves (i.e., expect ownership to limit people's actions in similar ways). Such a developmental shift has been found in other areas of social cognition, including children's understanding of how group membership influences actions. Research in this area suggests that children's judgments about groups differ depending on whether children are making judgments about their own group members or members of novel groups to which they do not belong. For instance, when 5-year-olds belong to a novel group, they attribute positive behaviors to their group members compared with members of another group; however, children predict that both their group members and members of another group would equally engage in negative actions (Dunham, Baron, & Carey, 2011; also see Patterson & Bigler, 2006). That is, children's own group membership influences their predictions of positive actions but not negative actions. A different pattern emerges when children make judgments and predictions about novel groups that they do not belong to. Specifically, children first use group membership to predict negative actions and later use group membership to predict positive actions. For example, 3-year-olds predict that negative actions will be directed between members of different groups; whereas, it is not until age 6, that children predict positive actions will be directed towards members within the same group (Rhodes, 2012). Such findings suggest that children's expectations of their own group members develops differently than their abstract reasoning of social groups in general, which may be similar to the development of children's understanding of ownership.

If this second explanation is correct, it would be important to consider *why* children first understand that ownership constrains their own ability to act on their preferences and only later

develop an abstract understanding of ownership as a constraint. One possibility is that this reflects children's previous experiences and the input they receive from others about how ownership limits the ability to act on preferences. Children might hear more statements or feedback about their own respect for people's ownership than statements referring to the expectation that others should respect ownership regardless of preferences. Receiving consistent feedback about the acceptability of their own actions in relation to ownership might help children develop an understanding that "*I* cannot take objects that do not belong to me" (individual rule) before understanding that "*People* cannot take objects that do not belong to them" (general rule). Previous findings show some support for this possibility—research shows that parents do not reliably uphold ownership in conflicts between children (both peers and siblings) over objects, and encourage their children to offer toys to others regardless of who owns it (Ross, 1996, 2013; Ross, Tesla, Kenyon, & Lollis, 1990). That is, when children are in conflict with someone over an object, their parents tell them to respect ownership and give up the toy that belongs to the other person; however, their parents also encourage them to share and offer their own toys to others. Such input might lead children to believe that others are not expected to respect ownership in the same way they are when they desire an object (at least at younger ages).

Using Ownership to Infer Preferences

The latter half of my dissertation investigated whether ownership influences children's inferences of which objects people prefer (see arrows representing relationships 3, 4, and 5 in Figure 1). Previous research showed that ownership influences children's own preferences for objects (e.g., Gelman & Davidson, 2016; Gelman et al., 2012; Hood et al., 2016), but little research had investigated whether children expect owners to prefer their own property. Further, previous research found that object histories influence children's judgments of which objects are

worth more and belong in museums, but most work investigating these judgments focused on only two types of distinctive histories—celebrity contact and original creations (Frazier & Gelman, 2009; Gelman et al., 2015; also see Hood & Bloom, 2008). As such, it remained unknown whether children consider other types of distinctive object histories, aside from celebrity contact and original creations, and whether children use these histories to infer which objects are *special* to owners.

My findings show that children's use of ownership to infer others' preferences for objects depends on the type of inference they are making (i.e., which object a person likes more or which object is special to a person). When judging whether people prefer their own object or a more attractive object belonging to someone else, children did not expect owners to prefer their own property (Chapter 3), which is consistent with previous findings (Gelman et al., 2012). In contrast, children considered object histories when inferring which objects are special, and were more likely to consider these histories when they were distinctive and involved a personal connection (Chapter 4). Together, these findings show that ownership influences children's preference inferences differently depending on whether children are inferring which object a person likes more or which objects are more special to an owner.

One possible reason for this differences is that children might believe that different forms of regard depend on different factors. Ownership might influence deeper forms of regard, such as which objects are considered special, whereas, physical features of objects might influence which objects are liked more. On this view, ownership is less relevant for judgments of which objects people like than judgments of which objects people have a deeper regard for. For instance, children might infer that a boy likes his toy less than someone else's more attractive toy that has nicer features and functions better, but may infer the boy believes his own toy is special

because it is his. This possibility is consistent with previous research showing that children often refer to characteristics of objects when explaining why a person likes an object (Eisenberg, Murray, & Hite, 1982; Nancekivell & Friedman, 2014, Experiment 1), though, it is up to future research to directly investigate whether children rely on different factors to infer different forms of regard for objects.

Another potential reason why children might not have expected owners to prefer their own property (Chapter 3) is because of the qualitative difference between the objects (a concern that does not apply to Chapter 4 when children judged which of two identical-looking objects was special to an owner). Similar to the argument made above, it is possible that children would have inferred that owners prefer their own property if the objects were identical-looking or of similar attractiveness as someone else's. However, previous research found that children do not expect others to like their property even if these objects look similar to objects belonging to others (Gelman et al., 2012).

Why Children Use Ownership Differently for Actions and Preferences

A noteworthy finding of the studies within this dissertation is that children by age 4, expect people to respect others' ownership rights but do not expect owners to prefer their own property (Chapter 3). This finding is a bit surprising given that ownership influences children's own preferences—young children often prefer their own objects (Gelman & Davidson, 2016; Gelman et al., 2012; Harbaugh et al., 2001). One potential explanation for why ownership influences children's predictions of others' actions but not their inferences of others' preferences is that children might be exposed to more instances of people respecting ownership than instances of people showing a strong preference for their property. For example, children might rarely hear people express extreme preferences for their own objects or see how others'

preferences influences their ownership (e.g., witness people show a preference for an object at a store and then subsequently purchase it). However, children may witness many instances of people interacting with their own objects or restricting others' use of them. Such exposure (and lack thereof), might help children become aware of the relationship that exists between ownership and actions but not ownership and preferences.

Alternatively, children may not use ownership to infer people's preferences because ownership and preferences do not always align (i.e., sometimes people like others' property more than their own), and findings from previous research suggest that children might be sensitive to this. That is, children do not infer who likes an object from information they use to infer who owns it (Malcom et al., 2014; Pesowski & Friedman, 2016). For instance, children infer that a person who emotionally reacts (i.e., becomes sad) when an object breaks is more likely to own the object than a person who does not emotionally react; however, children do not infer that the emotional person likes the object more (Pesowski & Friedman, 2016). Such findings show that children use people's emotional reactions to events involving objects to infer who the owner is but not to infer who likes the object, and suggests that children do not expect people's ownership and preferences to align.

A final explanation for why children may use ownership differently when predicting actions and inferring preferences is that actions are more central to ownership than preferences. For instance, the right of owners to exclude and prohibit people from using their property is a central part of ownership (Cohen, 1954; Merrill, 1998). Ownership, therefore, relates to people's actions in a way that does not apply to people's preferences—owning an object does not prohibit others from liking it. Similarly, liking an object does cause one to own it, and disliking an object does not renounce ownership. In fact, children understand that ownership is independent from

desires and at age 4, judge that a person owns an object even if it is undesirable (Noles & Gelman, 2014). As such, children might have a greater understanding of the relation between ownership and actions than ownership and preferences because permissibility to use objects is central to ownership, but preferences for objects is not.

Relevance to Psychological Theories of Ownership

The findings from my dissertation have contributed to a recent theory which posits that children have a naïve theory of ownership (Nancekivell et al., 2019). Naïve theories (also known as folk, intuitive, and commonsense theories) are skeletal frameworks that are specialized in specific areas or domains and help individuals predict, explain, and interpret events (Carey, 1985; Gelman & Noles, 2011; Nancekivell et al., 2019; Rhodes & Wellman, 2017; Wellman & Gelman, 1992). These theories are thought to emerge early in development, and are amended and expanded over time with experience (Gelman & Noles, 2011).

Before the recent proposal that children have a naïve theory of ownership, researchers believed in several naïve theories: naïve psychology, naïve biology, naïve physics, and naïve sociology (Carey, 1985; Gopnik & Wellman, 1994; Hirschfeld, 1996; Inagaki & Hatano, 2002; Rhodes, 2012; Wellman & Gellman, 1992). It is argued that these naïve theories have several key components, including ontological commitments (i.e., specific types of entities that are relevant to, or exist within, the theory), causal laws, and unobservable constructs (Carey, 1985; Gelman & Noles, 2011; Nancekivell et al., 2019). For instance, a person can be thought of as an entity that has desires (naïve psychology) and a digestive system (naïve biology), and is subject to gravity (naive physics) (Gelman & Noles, 2011; Nancekivell et al., 2019). Of relevance is the naïve theory of psychology, which allows children to causally reason about people's actions in terms of their mental states (i.e., unobservable constructs), like their beliefs, desires, intentions,

and goals (Wellman & Bartsch, 1988; Wellman & Gelman, 1992; also see Rhodes & Wellman, 2017).

As my dissertation points out, the existing naïve theories cannot account for an understanding of ownership because there are situations in which ownership conflicts with people's mental states (i.e., naïve psychology; Nancekivell et al., 2019). As such, if individuals only relied on their naïve psychology to predict actions, they would mistakenly expect others to act on preferences and violate ownership rights. However, as my findings show, children at age 4 expect people to respect ownership, and at age 5, expect people to respect ownership even if they prefer someone else's property (Chapter 3). Furthermore, naïve psychology could not explain why a person chose one object over an identical-looking one, but a naïve theory of ownership would allow individuals to infer that the person acted on that specific object because it belongs to the person (see Nancekivell & Friedman, 2017).

My findings also provide support for an existing theory of ownership, which is that people view their property as extensions of themselves. According to this theory, people view objects as parts of themselves, and their property helps define who they are (Belk, 1988, 1991; Diesendruck & Perez, 2015; Hood et al., 2016; Rochat, 2010; Wallendorf & Arnould, 1988). This view is supported by findings that 9-year-olds are more willing to give their shirt to a negatively evaluated child (i.e., a "bad" boy/girl) when it is thoroughly cleaned compared with when it is not (Diesendruck & Perez, 2015). Such findings suggest that children view their property as containing parts of themselves and are reluctant to give their property to someone who is negatively evaluated because they believe that this person's contact with their property will affect their self. Further, on this view, objects that symbolize memories, feelings, and

experiences play an especially important role in people's sense of self because they help remind people of their history (Belk, 1988,1991; Kleine, Kleine, & Allen, 1995).

This extended-self view of ownership helps explain why children might believe objects with interesting and distinctive histories, particularly histories indicating that objects were acquired from interesting locations or in interesting ways, are special to owners but do not believe objects with these histories are special in general. That is, children might understand that objects with distinctive histories are important to owners because they act as symbols and physical reminders of past experiences (see Lagattuta et al., 1997), and therefore help the owners construct their sense of self. These findings are consistent with research showing that older children, age 8-13, believe that souvenirs remind them of their experiences and help communicate who they are to others (Baker, Kleine, and Bowen, 2006). Though, my findings extend existing knowledge by showing that younger children, age 4-7, understand the importance of particular objects on the sense of self, and are sensitive to this relationship when making judgments about *others'* property.

Lastly, my findings are also informative about the *development* of children's understanding of ownership. Findings showing that children only defend their own ownership rights at age 2 (Eisenberg-Berg et al., 1981; Hay & Ross, 1982; Kanngiesser & Hood, 2014; Rossano et al., 2011) and uphold others' ownership rights at age 3 (Neary & Friedman, 2014; Riedl et al., 2015; Rossano et al., 2011; Schmidt et al., 2013), could be taken as evidence that children's notions of ownership rights are initially egocentric. That is, children first understand their own ownership rights and only later develop an understanding of others' rights (Goddard & Wierzbicka, 2016; Rochat, 2011). However, my investigation of children's resource allocations (Chapter 2) casts doubt on this notion as 2- and 3-year-olds generally showed similar respect for

others' ownership rights. Future research investigating how younger children react to ownership violations using diverse methodologies, including eye-tracking and physiological recordings, would further our understanding of the development of children's notions of ownership.

Generalizability of Findings

The children in my dissertation were tested in Canada and were from families who are mostly middle-class and Caucasian. Given this, it is unclear how these findings extend to children in other cultures and children who have a different socio-economic status (SES).

Some findings suggest that culture and SES influence children's resource allocations. Both middle-class 3-year-olds who live in the United States and 3-year-olds who live on the streets of Brazil tend to self-maximize and take the majority of a windfall of resources for themselves and give vanishingly little to others. Conversely, low- and middle-class children who are from collectivist cultures, like Peru, Fiji, and China, tend to display the opposite tendencies and give more resources to others (Rochat et al., 2009). Given these findings, children from collectivist cultures might take fewer resources for themselves and give more of their own resources to others than children who participated in my studies.

Furthermore, there is evidence that culture and SES influence children's understanding of ownership. With respect to inferring ownership, children by age 2 in North America typically use first possession to infer who owns an object (Blake & Harris, 2009; Friedman & Neary, 2008); however, it is not until age 8 that children in Kenya make this inference (Kanngiesser et al., 2015). When attributing ownership, 3-year-olds in America, the United Kingdom, Japan, and China believe that the owner of an object is the person who made it (Kanngiesser et al., 2010; Kanngiesser, Itakura, & Hood, 2014; Rochat et al., 2014), but it is not until age 5 that children in Vanuatu and Brazil make this inference (Rochat et al., 2014). Further, when deciding which of

two people should get an object and there is no relevant information to consider when making this decision, Chinese children typically split the object in two equal halves (a strategy that is not commonly used by middle-class American and Brazilian children, and is extremely rare among low-SES children from Vanuatu and Brazil; Rochat et al., 2014). Overall, these cross-cultural findings suggest that culture and SES influence children's developing notions of ownership.

The differences in how children across cultures reason about ownership give rise to the possibility that the findings in this dissertation might not extend to children in all cultures. Given that lower-SES children from rural villages tend to reason about ownership later in development, they might be less likely than the Canadian children tested in this dissertation to respect others' ownership rights and expect others to do so, particularly when another person's property is desired. In contrast, children from collectivist cultures might be more likely than North American children (in particular, those who live in communities that promote individualistic ideals) to respect ownership and expect others to uphold it even when their preferences conflict. One reason for this hypothesis is that collectivist cultures place more value on the well-being of the group than an individual's personal interest (Moorman & Blakely, 1995; Wagner & Moch, 1986). That is, children from collectivist cultures might expect people to avoid violating others' ownership rights in order to maintain social harmony.

Lastly, there may be differences in how people from different cultures value objects. Although no research to my knowledge has examined which objects children prefer in different cultures, research does suggest that American adults favor objects because of their personal memories associated with the object, while adults in the Republic of Niger value objects for their functionality, monetary value, signals of prestige, and spiritual associations (Wallendorf & Arnould, 1988). Given these differences, it is possible that children from other cultures would

not use history to infer which objects are special to owners as North American children did in Chapter 4, but rather would use the current properties of objects (e.g., what the objects look like or do) to make these judgments. If children did this, they would randomly choose between two similarly-looking objects when deciding which one was special to the owner. Such findings would be similar to the judgments North American children made when deciding which stuffed animals are special—they chose randomly between a new stuffed animal and one with a history, regardless of whether the history was distinctive or mundane. As such, conducting this research with children in other cultures will be important to determine how my findings extend to children outside of North America.

Conclusions

Together, my findings show development in how children integrate ownership into their social judgments: At age 2, children use ownership to guide their own actions; at age 4, children use ownership to predict other people's actions, and use object histories to infer which objects are special to owners; and at age 5, children expect others to respect ownership even when their preferences conflict. These findings have important implications for theories of ownership and raise potential questions for future research.

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