

Ownership and Value in Childhood

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Abstract

Ownership and value go together, and understanding both is imperative for children to know how to act in socially appropriate and advantageous ways. This paper reviews how children come to think about ownership and value. We first review how children consider history, labor, and control when inferring whether objects are owned and to whom they belong. We then review how children conceive of ownership rights and how they use ownership to anticipate other people's actions, feelings, and knowledge. With value, we first touch on children's attention to physical features and norms. We then discuss how ownership impacts children's valuations of objects, stemming both from children's own status as owners and from their knowledge of previous ownership. We also review how various kinds of distinctive histories affect children's valuations. Finally, we review children's understanding of how value depends on the market forces of supply and demand.

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INTRODUCTION

Ownership and value go together. Whether it is clothing, books, furniture, or food, we buy and make things because we value them. We trade and sell because we value the returns our belongings may fetch more than the belongings themselves. We donate and give away our possessions when we recognize they will be of greater value to others. And we throw things away when we think they have little value. But there are many other connections between ownership and value. For example, increasing the value of a resource has been viewed as justifying claims to own it [Locke 1978 (1690)], and ownership rules may often function to ensure that resources end up in the hands of those who value them the most (Friedman 2001). Merely owning an item increases how much we value it (e.g., Kahneman et al. 1990). Moreover, when valued items become difficult to obtain (as when supply is outstripped by demand), we may come to value them even more, as suggested by the higher prices we are willing to pay for them.

This article reviews how children come to understand ownership and value. These areas of knowledge allow children to act in socially appropriate and advantageous ways. Coming to understand ownership, for example, allows children to comprehend what is happening when people buy, sell, and trade things (e.g., Snare 1972). Without this understanding, a child would not grasp why we condemn a person who steals a coat but not a person who buys one, and this child would fail to anticipate when their own actions warrant condemnation. Likewise, coming to differentially value things and to recognize how others value them allows children to know which things are worth having and acquiring. Without understanding how objects are valued, a child might remain confused about why people place so much more value on some items than others, and this child might trade their most valuable possessions for others worth much less.

This article provides an overview of what developmental psychology has revealed about ownership and value in childhood. Although we review relevant theories, we do not champion any particular account, nor do we attempt to adjudicate between competing theories. While our goal is to provide a comprehensive review on ownership and value in childhood, we had to leave out some relevant and related topics, including children's understanding of money (e.g., Webley 2005) and brands (e.g., Chaplin & John 2005), the effects of ownership on children's memory (e.g.,

Table 1 Summary of some of the main developments in children’s understanding of ownership and value

Age	Ownership	Value
Before 2	Use possessives to express ownership	Value objects for physical features Prefer gender-stereotyped toys
2	Infer ownership from first possession Defend and assert own ownership rights Show some restraint in taking others’ possessions Use ownership to infer emotions	Prior choices affect preferences Prefer own objects over similar ones (mere ownership effect)
3	Assume artifacts are owned Infer ownership from control (of permission) Defend others’ ownership rights Consider labor when distributing earned items	Use gender stereotypes to explain others’ preferences Prefer items others have chosen and avoid those rejected by others
4	Understand how ownership is acquired and transferred View labor as basis for transferring ownership Use ownership to predict what others will use	Expect others to prefer handmade objects Value celebrity possessions and objects with distinctive histories Infer others’ preferences from shelf-based scarcity Understand how supply affects sales and prices
5	Use ownership to infer others’ knowledge Reason about intellectual property	Demonstrate reluctance to trade own possessions (endowment effect) Devalue and avoid objects from bad people Use supply and demand relations to infer desirability Prefer numerically scarce items Value own creations (IKEA effect)
6 and older	Expect owners to win disputes over nonowners Deny ownership for incapacitated people	Increase valuations to justify effort Demonstrate heightened avoidance of dirty money Understand how demand affects sales and prices

Note: Some abilities were not investigated within the constrained range of ages and may emerge earlier. Additionally, most ages reflect findings from Western samples and so ages could vary across cultures.

Cunningham et al. 2014), and how children on the autism spectrum reason about ownership and value (Hartley & Fisher 2018, Hartley et al. 2020).

We begin by focusing on ownership and then move to value; **Table 1** summarizes some of the major findings from each section. Because ownership and value are intertwined, these sections each touch on the other topic.

OWNERSHIP

Children must have some understanding of ownership to know how to interact with objects and resources and to understand others’ interactions with them. To organize our review of how children make these judgments, we first review how children make inferences about ownership—for example, how they infer that one apple is owned while another is not or how they infer that a certain hat belongs to their friend and not to anyone else. After this, we discuss how children use ownership to make other judgments, such as judging that other people should not take a friend’s hat without her permission and judging that she will be upset if someone does so.

Property and Owners

To think about ownership, children need to recognize that some objects are owned and others are not and also to know which objects belong to which people. Children can make some of these judgments from very early in development. One place we see this is when children produce

and respond to ownership-related language. Possessive pronouns (e.g., “my,” “mine,” “yours”) and other possessive constructions (e.g., “Daddy chair”) are among children’s first multiword utterances (e.g., Brown 1973). Although these expressions can be used to convey relations besides ownership, children appear to recognize them as pertaining to ownership from early on (for further discussion, see Blake & Harris 2011). For example, Tomasello (1998) noted that from around 20 months, his daughter’s use of possessives suggested that she recognized that ownership of property persists even when the owner is not nearby. Toddlers likewise respond correctly when possessives are used to ask about who owns familiar objects, such as their own toothbrush or their mother’s shoes (Brownell et al. 2013, Fasig 2000), and they also learn about specific ownership relations from verbal testimony (e.g., “This is your toothbrush”) (e.g., Blake et al. 2012; see also Saylor et al. 2011). However, as we show below, children have many other ways of judging whether things are owned, above and beyond language. We organize our review of how children make these judgments around three principles: temporal precedence, labor and creation, and control.

Temporal precedence. People who line up early are served before latecomers, and animals that establish a territory have a competitive advantage over late arrivers who challenge them (Stake 2004). Property law also often favors being earlier in time. For example, in *Armory v. Delamirie* (1722), a chimney sweep found a jewel and had a goldsmith weigh it, but the goldsmith refused to return it. The verdict favored the chimney sweep because he possessed the jewel before the goldsmith. Even so, the chimney sweep’s claim was not absolute. If the person who originally lost the jewel was found, this person would be favored over the chimney sweep.

Young children also base ownership judgments on temporal precedence and past events. When asked why a person owns some item, 4- and 5-year-olds often reference past events (Nancekivell & Friedman 2014). For example, they say that a girl owns a rock because she found it or that a boy owns a painting because he made it. Children also consult the past when picking out which of several identical-looking objects is theirs. For example, they will spontaneously look for physical traces they previously left on their object (Gelman et al. 2016; see also Gelman et al. 2012).

Focusing on the past and temporal precedence is also apparent when children consider situations more reminiscent of the case of the chimney sweep and the jewel. Children as young as ages 2 or 3 judge that the first person to possess an object is its owner (e.g., Blake & Harris 2009, Friedman & Neary 2008, Li et al. 2021; but for evidence that these judgments emerge later in some cultures, see Kanngiesser et al. 2015). For example, if a girl plays with a ball and then a boy plays with it, children say it belongs to the girl. Children even make similar judgments about nonphysical property, though not until later ages. At about age five or six, children reason about intellectual property and judge that the solution to a math problem belongs to the person who found it first (Olson & Shaw 2011). By age 9, children also favor firstcomers over those arriving later when judging who owns land (Verkuyten et al. 2015a,b), though most children actually say the land belongs to both parties.¹

That said, ownership judgments sometimes require forgoing temporal precedence. For instance, after a gift is bought or a present is given, the recipient is the owner rather than the person who initially had it. Young children understand that ownership can be transferred. For example, 4- or 5-year-olds understand that someone who buys an object owns it (Cram & Ng

¹While these studies suggest that children assign ownership based on temporal precedence, the studies may involve different kinds of judgments. When the girl and boy each play with the ball, being first does not cause the girl to own the ball. But when the girl finds a nonowned rock, being first does cause her to own it. Thus, some studies may show that children view temporal precedence as a cue indicating ownership whereas other studies may show that children treat it as a cause of ownership.

1989, Nancekivell & Friedman 2014), 5-year-olds reason in sophisticated ways about the fairness of trades (Echelbarger et al. 2020), and young children often understand that the recipient of a birthday gift is its owner (Blake & Harris 2009, Friedman & Neary 2008, Noles & Gelman 2014). Nevertheless, children sometimes appear to find transfers of ownership difficult to acknowledge. When asked about gift exchanges that happen outside of contexts such as birthday parties, children sometimes insist that gifts remain the property of the giver (Friedman & Neary 2008, McDermott & Noles 2018, Noles & Keil 2019). Although the boundaries and causes of this difficulty remain unknown, it could reflect problems with overcoming the tendency to base ownership decisions on precedence.

Labor and creation. Anthropologists have suggested that across all cultures, people are normally viewed as owning things they create or labor to obtain from nature (Barnard & Woodburn 1988, pp. 23–24). This ubiquitous belief captures the essence of John Locke's [1978 (1690)] claim that people come to own things by laboring on them. According to Locke, people own their labor, and this labor contributes the bulk of value to things. Thus, by mixing labor into a thing, people come to own it.

Children also connect labor and creation with ownership. For example, in an experiment where children and a puppet each made artwork, 2- and 3-year-olds judged that they would keep the artwork they made, and the puppet would keep what it made. Some children even spontaneously protested when the puppet tried to take the artwork that they had created (Kanngiesser & Hood 2014). Children also consider labor when reasoning about why other people own particular things; for example, when asked why a girl owns a certain painting, 4-year-olds explained that she had made it (Nancekivell & Friedman 2014). Further, children may consider labor and creation when deciding whether items are owned. From age 3, children judge that artifacts, such as shoes and soccer balls, are more likely to be owned than natural kinds, such as pinecones and leaves, and older children even hold these differing expectations for unfamiliar objects (Neary et al. 2012). These judgments could reflect an understanding that people create artifacts but not natural kinds (Gelman 1988).

Children may also view creation as a stronger basis for acquiring ownership than other means of obtaining things. Children aged 4 to 7 view others as having stronger claims over things they created than things they found (Davoodi et al. 2018). The primacy of creation was also suggested by a study examining children across a broad range of cultures, including children in China, Brazil, and Vanuatu (Rochat et al. 2014). In considering various disputes where two characters each claimed to own the same thing, 5-year-olds across cultures more strongly sided with characters who had made the disputed object than characters whose claims were based on other principles of entitlement.

The research described so far is consistent with findings showing that children care about temporal precedence and past events in their ownership judgments. After all, the person who creates an object is also usually the person who had it first. However, creation and temporal priority can conflict, and when they do, children often give more weight to creation (Kanngiesser et al. 2010, 2014; Li et al. 2021; for related research, see also Hook 1993). For example, in one study where children and an experimenter made figurines using one another's playdough, children judged the figurines as belonging to their creators rather than to the original owners of the materials (Kanngiesser et al. 2010). However, this tendency to prioritize creation over prior ownership varies on the basis of children's cultural background and whether children make judgments about a situation in which they are directly involved (i.e., where they actually created something) or instead about a situation in which they are only spectators (e.g., Kanngiesser et al. 2014).

Control. Ownership is also closely linked with control. For example, when fishing, you cannot just point at a fish and claim it is yours; you actually have to catch (i.e., physically control) it.

Ownership typically also implies control. If something is yours, you are usually entitled to decide what happens to it and who gets to use it.

Children show sensitivity to the relation between control and ownership in several ways. They use control as a cue for inferring to whom particular objects belong. Specifically, when someone has control over who else uses a toy (i.e., the person grants or denies permission for others to play with it), children aged 3 and 4 infer that this person owns the toy (Neary et al. 2009; see also McDermott & Noles 2018). Further, 6-to-8-year-olds treat this kind of control as a cue for inferring ownership of ideas (Shaw et al. 2012).

Children also consider control when judging whether animals are owned. Children normally judge that people own artifacts and natural kinds in their yards (Goulding & Friedman 2018). With animals, however, these judgments depend on control (Espinosa & Starmans 2020). For example, while 5-to-8-year-olds normally deny that a fox in someone's yard belongs to anyone, they are more likely to attribute ownership if the fox is caged. Likewise, if an unfamiliar kind of animal is in a fenced yard, children's judgments about whether it is owned depend on whether it has wings (and thus can leave the yard) or not, further testifying to the importance of control in children's intuitions about ownership.

Finally, beliefs about control may underlie children's judgments about what kinds of agents can be owners. Besides recognizing that individual people own things, young children recognize that groups such as families and clubs can also own property and that certain kinds of property are more likely to be owned by a group than by an individual (e.g., a sofa versus lipstick; Huh & Friedman 2017). Young children also attribute ownership to robots (Kanngiesser et al. 2014) and to at least some kinds of animals (Noles et al. 2012), and even toddlers appear to recognize the oddness of describing things as belonging to inanimate objects (Golinkoff & Markessini 1980). However, children also sometimes deny that certain kinds of people can own things. Specifically, when asked yes-or-no questions about whether various kinds of agents can own things, children aged 5–6 generally say that a person who is in a coma, asleep, or tied up cannot be an owner (Noles et al. 2012). These denials could stem from assessments of control. That is, children may feel that because a person in these states cannot control or use an object, the person cannot actually own it.

Ownership Rights

Knowing who an object belongs to (or knowing that an object is or can be owned) is one thing; knowing the consequences of this information is quite another. One consequence of ownership is that it confers rights to owners, and these rights govern the permissibility of people's actions with objects. For example, accounts of ownership often hold that owners are entitled to use their possessions, whereas nonowners are not permitted to access them without the owner's permission (e.g., Snare 1972). Understanding these rights is crucial for appropriate social interactions. Without this understanding, children might recognize which things belong to other people, but they would have no idea how to act on this information.

Children's understanding of ownership rights emerges early, and several lines of evidence suggest that even toddlers recognize their own ownership rights. For example, toddlers are more possessive of and defensive about objects they own than objects that are not theirs (e.g., Eisenberg-Berg et al. 1979, 1981; Hay & Ross 1982; Ross 2013), and they spontaneously protest when others attempt to take or throw away their possessions (Kanngiesser & Hood 2014, Rossano et al. 2011, Vaish et al. 2011). Some findings suggest that toddlers may also have some appreciation of others' ownership rights: At 18 months, they show concern for someone whose property has been taken or damaged and subsequently display more prosocial behaviors toward the victim (Vaish et al. 2009). Toddlers also sometimes resolve disputes over objects by ceding to the owner, suggesting

they may appreciate that owners are more entitled to property than nonowners (e.g., Hay & Ross 1982, Ross 1996). Finally, 2-year-olds also show some restraint when given the opportunity to take others' resources (Pesowski et al. 2019; for related research on older children across several cultures, see Ulber et al. 2015 and Kanngiesser et al. 2019).

It is not until age 3, though, that children protest or intervene when others' ownership rights are violated (Rossano et al. 2011). For instance, 3-year-olds protest when someone takes a hat belonging to another person and attempts to throw it away, whereas 2-year-olds do not. Children aged 3 also defend and uphold owners' entitlements to make decisions about their property, such as deciding who is allowed to use it (Schmidt et al. 2013), and they tend to return stolen items to their rightful owners (Riedl et al. 2015). Further, consistent with the idea that labor is rewarded by ownership, 3-year-olds consider people's relative contributions to securing resources when taking or distributing them (Baumard et al. 2012, Kanngiesser & Warneken 2012, Kanngiesser et al. 2020, Warneken et al. 2011). For example, 3-year-olds share resources equally with others when they worked collaboratively to obtain them (Warneken et al. 2011).

However, young children likely see ownership rights as doing more than preventing loss of property. Instead, children may see these rights as enforcing owners' control of their property. In line with this, young children reason similarly about people's control over their belongings and over their own bodies. For example, children believe it is worse to touch someone's property or body than to look at either, and children view the acceptability of physical contact as dependent on the owner's consent (Van de Vondervoort et al. 2017). Also, whereas concerns about deprivation could lead children to view the loss of objects as acceptable so long as a replacement is provided, children reject this. For example, 3-year-olds judge that owned objects rather than duplicates should be returned to owners (McEwan et al. 2016). This account of ownership rights has its roots in Locke's [1784 (1690)] claim that people have ownership of their bodies and is also broadly consistent with claims that children recognize people as having a personal domain wherein they can make decisions without regulation by others (Nucci 1981, Nucci et al. 1996).

However, some findings conflict with this picture of children viewing ownership rights as conferring control. For example, children may deny that owners are permitted to destroy their property or to modify it in some ways (Kim & Kalish 2009), and they affirm that nonowners are permitted to fix broken property even if the owner has not consented (Stonehouse & Friedman 2021). Also, when children consider the acceptability of digitally tracking other people, they may be more wary about digitally tracking others' bodies than their possessions (Gelman et al. 2018). Moreover, concerns about control may not explain children's distaste for plagiarism and theft of intellectual property. While children aged 6–8 may view people as entitled to decide how others use their ideas (Shaw et al. 2012), their negative evaluations about theft of intellectual property may primarily reflect concerns that people will not get proper credit for their ideas (Shaw & Olson 2015).

Although people are normally entitled to use their property as they wish, there are also limits on ownership rights. Usually, nonowners are prohibited from taking property without the owner's permission. However, there are some instances where this may be acceptable. For instance, few adults condemn stealing medicine to cure an ailing spouse. Also, while we usually think that people are entitled to the money they earn, most people accept that they owe some of their income to taxes.² Young children also recognize these kinds of limitations on ownership rights. When 3-to-7-year-olds hear about a boy who needs to use a girl's crayon to finish a card for his mother,

²When the anthropologists Barnard & Woodburn (1988) noted that all cultures recognize people as owning the items they create and labor to obtain, they also added that all cultures also require people to give up or share some part of these resources.

they side with the girl if she insists that he immediately return it. However, if he instead needs the girl's net to save a drowning dog, children say he should take it, even if this goes against the owner's wishes (Neary & Friedman 2014). With age, children also find it more acceptable to take resources from rich people and give them to the poor than the reverse (Essler & Paulus 2021; see also Echelbarger et al. 2022). Such judgments may also depend on children's perceptions of their own wealth (Elenbaas 2019a). Children also sometimes accept transferring rewards from one individual to another when differences in their wealth result from unequal opportunities [i.e., in a game where one player is provided with more tools to complete a reward-earning task (Elenbaas 2019b)].

Inferring Actions, Emotions, and Knowledge

Beyond telling children about what they and others should do, understanding ownership also allows children to anticipate how people will act and feel and what they are likely to know. For example, 4-year-olds expect people to take and use their own property instead of someone else's, and 5-year-olds expect that people will use their own possessions even if they prefer objects belonging to others (Pesowski & Friedman 2018). Also, when reasoning about conflicts over owned property, older children (aged 6–8) expect owners to win over nonowners, possibly reflecting an understanding that owners are more motivated to protect their property than others are to obtain it (Pietraszewski & Shaw 2015).

Children also consider ownership when thinking about others' emotions. Taking others' property has social and emotional consequences such that owners' emotions are typically tied to their objects. By age 2, children are aware of the emotional consequences of ownership violations and expect owners to react negatively when their property is lost or used by others without permission (Pesowski & Friedman 2015). Children also perform the reverse inference as well—they can use people's emotions to infer ownership. By age 4, children infer that people who display appropriate emotional reactions to events involving objects are more likely to be the objects' owners than are those who react inappropriately (Pesowski & Friedman 2016). For instance, preschool-age children believe that a person who becomes sad after an object breaks is more likely to be its owner than someone who becomes happy.

Children also use ownership to infer others' knowledge (Banerjee et al. 2015, Nancekivell et al. 2020). Specifically, they assume that owners know more than others about their possessions and use this to inform judgments about who is most likely to know the function of an artifact. For example, 5-to-10-year-olds and adults infer that the owner of a novel artifact is more likely than a borrower to know what it is for. This trust in owners disappears, though, when the object is described as new to both individuals (Banerjee et al. 2015). As with emotions, children may also perform the reverse inference. At age 5 (but not 4), they infer that someone who knows less-accessible information about an object is more likely to be its owner than someone who knows more-accessible information (Nancekivell et al. 2020).

VALUE

Besides coming to understand ownership, it is important for children to understand which objects and resources are worth owning, or at least which are worth caring about. This requires understanding which resources have value and recognizing which features of objects affect their value. Without this understanding, children would have little insight into why people give more attention to some objects than others. At the same time, to the extent that some cues to value do not correspond to quality or usefulness, coming to share other people's valuations may help children fit in with those around them.

Objects' Physical Properties and Affordances

From the first year of life, children value objects for their physical features. Young children commonly form attachments to transitional objects (Busch et al. 1973; Litt 1981, 1986; Winnicott 1953). These objects are valued because of their comforting and soothing features and thus often take the form of soft objects, such as blankets and stuffed toys (Lehman et al. 1995, Litt 1981, Passman & Halonen 1979, Ybarra et al. 2000). Indeed, children at older ages who have attachment objects spontaneously refer to features such as softness when explaining why these objects are special to them (Lehman et al. 1995). Children also value other kinds of objects (i.e., besides transitional objects) for their physical features. For instance, 2-year-olds prefer interesting objects such as Slinkies and spin-tops over mundane and boring objects such as wooden cubes (Fawcett & Markson 2010, Ma & Xu 2011). Further, they anticipate that others will share these preferences (Ma & Xu 2011), and they preferentially trust recommendations from informants who share these preferences over recommendations from informants who do not (Fawcett & Markson 2010). Children also inversely reason between objects' features and people's preferences. When explaining why a person prefers a particular object, they often refer to its physical features (Nancekivell & Friedman 2014).

Children's preferences and beliefs about others' preferences are also shaped by norms, such as gender stereotypes (Amemiya et al. 2022, Blakemore et al. 1979, Eisenberg et al. 1982, Serbin et al. 2001). At 18 months, girls prefer stereotypically feminine toys such as dolls while boys prefer stereotypically masculine toys such as trucks (O'Brien & Huston 1985, Serbin et al. 2001). By ages 3 and 4, children use gender stereotypes to infer and justify others' toy preferences. For example, they claim girls like dolls and teapots because these are "for girls" (Eisenberg et al. 1982). Interestingly, however, children are less likely to reference gender when justifying their own preferences; instead, they refer to objects' functions and features (Eisenberg et al. 1982). Further, when deciding which novel objects and activities to choose, by age 3 children tend to select those endorsed by other children of the same gender and age (Shutts et al. 2010).

Choices and Labor

People's preferences and valuations are influenced by their actions. For example, merely by choosing one object over another, people come to like the chosen object more and decrease their regard for the unchosen one (Brehm 1956). Such effects of choice on preferences have long been viewed as evidence for cognitive dissonance (for a review, see Enisman et al. 2021). For example, people may reduce their regard for the unchosen object to rationalize why they rejected it. These effects of choosing are not restricted to adults. For example, after choosing item A over item B, toddlers and preschoolers devalue the rejected item—when offered a choice between item B and some new item C, they prefer the new one (Egan et al. 2007, 2010; Wiesmann et al. 2022).³

Children's valuations are also impacted by the effort and labor they put into obtaining items. For instance, 6-year-olds put more value on stickers (i.e., they are less willing to give them to others) if obtaining them was effortful rather than easy (Benozio & Diesendruck 2015). This effect may be especially pronounced when children discover that the stickers they have earned are unattractive (providing further evidence of children attempting to reduce cognitive dissonance).

³A potential concern is that such results could reflect preexisting differences in preferences for items rather than preferences induced by choice. To rule out this concern, earlier studies attempted to establish that participants initially found the objects similarly appealing (i.e., before choosing between them). Nonetheless, subtle differences in preferences might still sway their choices (Chen & Risen 2010). Hence, more recent studies have had participants initially choose between items that are covered up. Even with this procedure, preschoolers and toddlers continue to show choice-induced preference (Egan et al. 2007, Wiesmann et al. 2022).

Children aged 5–6 also show the IKEA effect (Norton et al. 2012) and preferentially value objects they create over similar objects made by others (Marsh et al. 2018, 2021; see also Li et al. 2013). However, findings are mixed as to whether children recognize that other people's valuations are impacted by labor. Children aged 4 to 12 do expect others to prefer handmade objects over those created in a factory (DeJesus et al. 2022). But in contrast with adults, 6-year-olds do not anticipate that a story character is more likely to keep an item that was laborious and effortful to obtain over an item that was acquired easily (Sehl et al. 2021).

Owning as a Source of Value

People value objects not only for their physical properties and affordances but also because of ownership itself. One reason for this is that owning an item increases regard for it. In the endowment effect, people are reluctant to trade items they have just been given for new items and charge a higher price when selling possessions than they are willing to spend when buying them (Kahneman et al. 1990, Knetsch 1989); in the mere ownership effect, people give higher preference ratings to items they own than to unowned items (e.g., Beggan 1992; for a much earlier demonstration of the effect in children, see Irwin & Gebhard 1946). While these effects may sound similar, they could have different explanations (see Morewedge & Giblin 2015). For example, some explanations for the endowment effect may not explain the mere ownership effect (for a recent example, see Smitzky et al. 2021).

Young children show both effects. For example, when 2- and 3-year-olds are told an object is theirs, they say they prefer it over other objects, including objects that look identical and those that are distinct but equally desirable (Gelman et al. 2012, 2016; but see Gelman et al. 2014). Also, children aged 5 and older typically prefer keeping their own objects and reject offers to trade these for different items (Harbaugh et al. 2001, Hartley & Fisher 2018, Lehman et al. 1995; see also Hood et al. 2016).⁴

Owning objects also affects valuations that run deeper than liking. Children with emotional attachments to their possessions strongly prefer them over other items. For example, 3-year-olds prefer their used stuffed animals, dolls, and sleep items to newer versions. In contrast, they do not prefer other kinds of old toys over new versions (Gelman & Davidson 2016). Likewise, 3-to-6-year-olds with attachment objects would rather have their existing possession than an exact duplicate purportedly generated by a copying machine, and these children sometimes refuse to allow their attachment object to be copied. In contrast, children without strong object attachments often accept the duplicate (Hood & Bloom 2008). We also see evidence that ownership affects deeper valuations from differences between how children assess liking versus caring (Pesowski et al. 2021). When 6-to-7-year-olds receive a sticker that is less attractive than one belonging to the experimenter, they indicate the experimenter's sticker when asked about which one they like more. However, they are comparatively more likely to choose their own sticker when asked which one they care about the most. Younger children, though, did not show this pattern and generally chose their own sticker regardless of which question was asked.

Famous Owners and Other Distinctive Histories

Beyond valuing their own possessions, people also value objects that have belonged to celebrities and other revered individuals (e.g., Gelman & Hirschfeld 1999, Newman & Bloom 2014). This

⁴Although ownership increases children's regard for their own possessions, they may not anticipate that others likewise prefer their own property (Gelman et al. 2012, Pesowski & Friedman 2018). For example, even after 3-year-olds say they like an object belonging to them more than other identical-looking objects, they do not infer that the experimenter likes their own object.

effect of celebrity ownership may reflect beliefs in contagion or sympathetic magic. That is, people may view famous individuals as having an essence, which is transferred to their possessions through physical contact (e.g., Nemeroff & Rozin 1994, 2000; Newman et al. 2011). Heightened valuations of celebrity possessions could also reflect tacit beliefs that possessions are extensions of the self (Belk 1988, Diesendruck & Perez 2015). Regardless of the explanation, young children also value objects owned by people they revere. For example, young children judge that the rubber duck belonging to Ernie from Sesame Street belongs in a museum (Frazier & Gelman 2009), anticipate that Harry Potter's glasses are worth more money than other pairs of glasses (Gelman et al. 2015), and prefer a spoon that once belonged to Queen Elizabeth II to a perfect copy (Hood & Bloom 2008; see also Hartley et al. 2020).

Like adults, children also value objects that are historically distinctive for reasons besides having belonged to a celebrity. In general, they believe that objects acquired from interesting places or in interesting ways are more special than objects without notable histories. For example, 4-to-6-year-olds believe that a baseball won as a prize or acquired on a vacation is more special than one bought at a local store (Pesowski & Friedman 2019). Children may also value objects that were the first of their kind (e.g., the very first game of Candy Land). From age 5, children judge that such original creations belong in museums (Frazier & Gelman 2009), but young children do not seem to recognize that original creations are worth more money than other items (Gelman et al. 2015) or are more special to their owners than newer ones (Pesowski & Friedman 2019).

Negative Moral Histories

Thus far, we have examined how an object's positive history can influence its value, but what about its negative history? To date, research on this question has primarily focused on moral history and investigated two key factors: (a) from whom the object is coming (i.e., a good or bad person) and (b) the history of the object itself.

Looking at the first point, research has revealed that an individual's negative moral history is powerful enough to lead children to sacrifice their material interests (e.g., Tasimi & Wynn 2016, Tasimi et al. 2017). For example, when given the choice between a smaller offering from a nice character (e.g., one sticker) and a larger offering from a mean character (e.g., two stickers), children ages 5–8 prefer to accept the smaller offering (Tasimi & Wynn 2016). But when the mean character's offering is sufficiently greater than the nice character's offering (e.g., sixteen stickers versus one), children are more likely to “deal with the devil” (Tasimi & Wynn 2016). What is more, children ages 5–6 are also more likely to value objects belonging to famous individuals who are morally good than bad (e.g., Peter Pan versus Captain Hook; Hartley et al. 2020). At this age, children are also more willing to receive and use an object (e.g., a shirt) that previously belonged to a bad person if it is cleaned (Diesendruck & Perez 2015).

Children are not the only ones to weigh an individual's negative moral history into their decision-making—infants seem to as well. For example, when shown a morality play in which a character is struggling to accomplish a goal (e.g., opening a clear box with a toy inside) and is then either helped or hindered by two other characters, 12- and 13-month-olds prefer to accept a single cracker from a helper than two crackers from a hinderer [note that this pattern contrasts with infants' preference for two crackers over one in the absence of any social information about the cracker-offerers (Tasimi & Wynn 2016)]. But like children, infants also seem to have a price—that is, when the hinderer offers eight crackers and the helper offers one cracker, two-thirds of infants sell out.

The above findings make it clear that children care about from whom objects are coming, but do they also care about the histories of the objects themselves? Money is a noteworthy object to

investigate in this regard because, perhaps unlike any other object in the world, its history and physicality should not matter—after all, it is designed to be fungible. Indeed, as Gertrude Stein once put it, “money is money and that is all there is about it” (Stein 1936). Yet research across the social sciences abounds with examples that suggest otherwise (e.g., Chen et al. 2017, Crockett et al. 2017, Di Muro & Noseworthy 2013, Galoni & Noseworthy 2015, Hoigard & Finstad 1992, Kardos & Castano 2012, Levav & McGraw 2009, Stellar & Willer 2014, Uhlmann & Zhu 2013).

Indeed, when it comes to money, people cannot help but think about its moral history (e.g., Bandelj et al. 2017, Shipton 1989, Tasimi & Gross 2020, Zelizer 1994). Just as a sweater worn by Hitler is thought to carry his essence (e.g., Rozin et al. 1986), people similarly consider money to carry traces of its moral history. In a series of experiments, participants were asked to imagine different people offering them money earned in different ways (Tasimi & Gelman 2017). Whether the amount was big or small or likely to get them into trouble or not, participants consistently preferred nonstolen over stolen money, even when nonstolen money was offered by someone who stole an equivalent, but different, sum of money. Similar effects have also been reported in children (Tasimi & Gelman 2021), suggesting that from an early age, a dollar is not just a dollar.

That said, children’s reasoning about dirty money appears to vary as a function of age. Compared with 8- and 9-year-olds, 5- and 6-year-olds seem to show less sensitivity to money with negative moral history (Tasimi & Gelman 2021). Although this finding is consistent with prior research indicating that contamination and contagion concerns increase from ages 5–6 to ages 8–9 (e.g., Diesendruck & Perez 2015, Gelman et al. 2015, Hejmadi et al. 2004, Legare et al. 2009), it remains an open question as to how and why children become more sensitive to an object’s negative history as they age.

Supply and Demand

The market forces of supply and demand together impact the availability of goods and the costs and efforts people will incur to obtain them. In this section, we review how these market forces impact children’s valuations and preferences for objects. We start by looking at how children consider supply and demand in isolation and then review how children look at them in relation to one another.

Demand and popularity. Objects that are high in demand are popular with others, and young children often want these objects. For example, 3- and 4-year-olds sometimes prefer foods and stickers that others have chosen or recommended, and they likewise avoid items others have rejected (e.g., Birch 1980; DeJesus et al. 2018; Hennefield & Markson 2016, 2017). At the same time, children’s sensitivity to others’ choices and preferences depends on who those others are. For example, children (and in some cases infants) often prefer options chosen or endorsed by others who speak their language (Kinzler et al. 2007), who match their age and gender (e.g., DeJesus et al. 2018, Shutts et al. 2010), or who appear to be prestigious (Chudek et al. 2012). Thus, children are not just considering how sought after a resource is—they are also assessing whether others’ perspectives should be trusted. Also, as we shall see when discussing shelf-based scarcity in the following section, some findings suggest that children sometimes disregard evidence that certain resources are high in demand (Smith-Flores et al. 2021).

Supply and scarcity. Supply is widely believed to impact adults’ valuations of objects. For example, Brock’s commodity theory is premised on the claim that transferable goods and messages are valued to the extent that they are scarce and unavailable (see, e.g., Brock 1968; Brock & Mazzocco 2004). Likewise, Cialdini (1984, 1987) includes the idea that scarcity is a cue to value among his

six principles of persuasion. The claim that scarcity increases adults' valuations was also supported by a meta-analysis of 46 studies conducted over 21 years (Lynn 1991).

But why should people value scarce resources? Many answers have been offered. For example, people might value scarce resources because they anticipate these resources could become unavailable [for an evolutionary variant of this account, see the discussion of reactance in Worchel et al. (1975) and Mittone et al. (2005)]. Alternatively, possessing scarce resources might fulfill people's desires to feel unique and distinctive (Fromkin & Snyder 1980). Or people might infer that scarce items are likely to be expensive and may likewise view scarcity as a sign of quality or status (Lynn 1989, 1992).

Claims that people value scarce items (e.g., Brock 1968, Cialdini 1984) have often cited studies on children (e.g., Brehm & Weinraub 1977, Mischel & Masters 1966, Pepitone et al. 1967). These developmental studies explored a broad range of manipulations, but recent developmental studies have primarily examined numerical scarcity, which amounts to low supply.⁵ These studies investigate whether children would rather have items low in supply over abundant items. For example, children in such studies might be offered a choice between two kinds of stickers while seeing that there are many of one kind of sticker and just a few of the other. As we show below, these studies of numerical scarcity have yielded conflicting findings.

In some studies, young children did not prefer scarce resources to abundant ones or appeared to prefer scarce resources only as a means of obtaining varied resources. In one series of experiments, 4-to-12-year-olds and adults chose photos of unfamiliar objects and could either choose photos that were scarce or abundant (Echelbarger & Gelman 2017). Although participants showed some sensitivity to scarcity, they did not show a clear or consistent preference for it. However, they did seek variety—they preferred taking two different photos over taking two copies of the same one. Somewhat similarly, 4-year-olds in another experiment did not prefer scarce stickers over abundant ones, nor did chimpanzees prefer scarce kinds of food (John et al. 2018). Children aged 6 did prefer scarce stickers, but this preference may have been robust only in competitive trials where children knew that a puppet would get to take a sticker after their own initial choice. So here, choices of scarce items might reflect an attempt to secure variety. If the puppet took the scarce sticker (only one was available), children would not be able to obtain it on subsequent trials.

In contrast, other studies have found that children value scarce resources. In one experiment, 5- and 6-year-olds preferred scarcity when offered a sticker from a card with eight stickers of one type and two of another (Ferera et al. 2020), though 3- and 4-year-olds did not show this preference. Another experiment likewise found scarcity preferences in children's choices between containers of grapes and crackers (Maimaran & Salant 2019). Children in these experiments were offered just one choice in a noncompetitive setting, so their preferences for scarcity are unlikely to proximally reflect a strategy for obtaining varied resources.

Moreover, further findings suggest that children may value scarcity because possessing scarce items fulfills a need to feel unique and distinctive (Fromkin & Snyder 1980). Evidence for this comes from a cross-cultural study that found differences in children's preferences for scarcity. Whereas Israeli 7-year-olds (but not 4-year-olds) preferred scarce stickers over abundant ones, Taiwanese children did not show this preference even at age 10 (Diesendruck et al. 2019). This finding echoes earlier research showing that scarce and unique items are preferred by European

⁵Early work sometimes described scarcity as arising in any circumstance making items more effortful or difficult to obtain. For example, some studies investigated whether children would view a toy as more attractive once told they would have to wait to play with it (e.g., Turner & Wright 1965).

Americans but not by East Asians (Kim & Markus 1999) and fits with claims that desires to feel unique and distinctive vary across cultures (Nisbett & Masuda 2003). It is worth acknowledging, though, that this cross-cultural difference is open to other explanations. Rather than reflecting cultural differences in the need to feel unique, it might instead reflect cultural differences in people's willingness to limit others' choices (Yamagishi et al. 2008; for related developmental research see Zhao et al. 2021). If a child takes the last swirly sticker, this means no one else can choose it.

The studies on scarcity we have reviewed so far examined children's responses to the relative scarcity of different kinds of items—instances where there are fewer items of one kind than of another. But this is not the only kind of scarcity. For example, sometimes we can infer that an item is scarce because of its popularity, as when a depleted store shelf suggests that previous shoppers have bought almost all the toilet paper. When consumer goods show such shelf-based scarcity, adults are more likely to choose them (e.g., Parker & Lehmann 2011, van Herpen et al. 2009). This reason for valuing scarcity incorporates information about demand and runs counter to the idea that scarce goods are valued because they help people feel unique (i.e., there is nothing unique about pursuing popular items). However, shelf-based scarcity might not impact children. Across a series of experiments, 4-to-10-year-olds could take a sticker from either of two boxes. One box had fewer stickers than the other, and children were told this was because the stickers it held had been more popular with previous participants (Smith-Flores et al. 2021). Although children generally understood that the (fictional) previous participants had preferred the scarce stickers, they did not preferentially choose these stickers for themselves. In fact, younger children often took an abundant sticker instead. This finding is surprising because, as we have reviewed, children often prefer items chosen and endorsed by others (DeJesus et al. 2018, Hennefeld & Markson 2017).

The differing results across the experiments on scarcity warrant further investigation. One explanation is that preferences for scarce goods vary on the basis of the items under consideration (for related discussion, see Brock & Mazzocco 2004). Scarcity may make some items seem distinctive or exclusive but may also bring us to dismiss other items as mere oddities. In line with this possibility, the studies reporting clear preferences for scarcity used attractive stickers, whereas the other studies did not allow participants to see the items or used arguably less attractive stimuli. So perhaps children value scarce over common items only when additional cues suggest the items are desirable.

Bringing Supply and Demand Together

So far, we have primarily looked at supply and demand in isolation from one another. Here we consider children's understanding of the relation between supply and demand. It is well known that this relation affects prices, which can be viewed as a measure of the value people place on things. Yet people often struggle to explain how supply and demand affect prices, and one reason may be that this requires thinking about the aggregate actions of many individuals (Leiser & Shemesh 2018). This may be much more difficult than considering the separate acts of just a few people. Nonetheless, young children show some ability to consider supply and demand in relation to one another.

Early research on children's understanding of supply and demand examined children's judgments about prices and volume of sales (Leiser & Halachmi 2006, Thompson & Siegler 2000; for an earlier study on older children, see Berti & Grivet 1990). For example, children in one experiment considered how sales at a lemonade stand would be impacted by a reduction in the number of people passing by the stand (reduced demand) or by the introduction of a rival lemonade stand (increased supply; Siegler & Thompson 1998). Similarly, children in another experiment judged how the price of getting a car washed would be affected by an increase in the local supply of car

washing services (Leiser & Halachmi 2006). Across these experiments, children consistently found it easier to think about demand than supply. For example, in the experiments on lemonade stands, children understood the effects of demand at age 4 or 5, whereas they understood the effects of supply only at age 8. Further evidence of this pattern was uncovered in a more complicated experiment in which 5-to-9-year-olds heard stories where one of four factors increased or decreased: demand, supply, price, or sales (Thompson & Siegler 2000). Children then judged how each of these changes would affect the other variables. Successful performance did not vary substantially across the four outcomes. For example, children were similarly successful regardless of whether they were asked about prices or about supply. But their performance did vary on the basis of which factor was manipulated. As in the other studies, younger children again struggled to anticipate the effect of increases or decreases in supply.

Why was it easier for children to understand the effects of demand than supply? One explanation is that younger children engaged in more-is-more thinking (Levin 1979, Stavy et al. 2002). That is, they may have assumed that one increase would be connected with another. This way of thinking produces success when children consider demand because it is positively correlated with sales and prices: Increasing demand leads to greater sales and prices (and likewise, decreasing demand causes sales and prices to decline). But more-is-more thinking produces failure when children are asked about supply, as increasing supply leads to fewer sales for individual vendors and to lower prices. This more-is-more explanation is similar to the proposal that younger children sometimes show a valence-matching response bias and give positive responses to positive information and negative responses to negative information (e.g., Pillow 1991).

That said, the more-is-more explanation is problematic. It raises the concern that young children might not have understood the effects of supply and demand at all. Instead, their performance could merely reflect a low-level response strategy. However, some findings suggest otherwise. For example, Siegler & Thompson (1998) found that although younger children often provided explanations consistent with more-is-more reasoning when justifying their judgments about the impact of supply, they rarely provided these explanations when justifying their judgments about demand. This suggests that children only rely on this strategy when they do not know how else to think about a situation. Leiser & Halachmi (2006) provided further evidence that children are not bound to more-is-more reasoning. They asked children how pleased customers would be with the changes in supply or demand, and again found that children had an easier time thinking about changes in demand than supply. But this cannot be explained by more-is-more reasoning because increasing demand should make customers less pleased, whereas increasing supply should make them more pleased. If children were limited to more-is-more reasoning, the results should have reversed—children should have done better when asked about changes in supply than demand.

In some recent research on children's reasoning about supply and demand, children were instead asked about the desirability and quality of resources rather than about sales and prices (Huh & Friedman 2019). Specifically, they judged the tastiness of sandwiches. Children aged five and older were sensitive to the manipulations of supply and demand. For example, they gave higher tastiness ratings to sandwiches from a shop that had 10 customers line up for 5 sandwiches than for a shop where 10 customers instead lined up for 20 sandwiches. These findings seem to contrast with the earlier research, which had suggested that 5- and 6-year-olds have difficulty making inferences based on differences in supply. But given the number of methodological differences between the experiments, this difference is not surprising. One key difference is that the earlier experiments involved changes in demand and supply because children judged how prices would be impacted if supply increased or decreased. In contrast, when children inferred the desirability of sandwiches, supply and demand were static.

FURTHER QUESTIONS

We close by briefly raising two directions for exploration given our review. One is rooted in the cross-cultural differences we reviewed. For example, we noted that children across a broad range of cultures link ownership with creation (Rochat et al. 2014) and that preferences for scarcity differ across cultures (Diesendruck et al. 2019; see also Kim & Markus 1999). Such findings raise the question of whether there is any order to these cross-cultural similarities and differences: Is there any way to predict which aspects of ownership and valuations are most likely to differ across cultures and which (if any) are most likely to be universal? Further, is there any way to predict which variations between cultures (e.g., in language or industrialization) are most likely to correspond with the differences in ownership and valuations that emerge? These questions will be very challenging to answer. For example, although we might have expected that abilities that emerge especially early in development should be the most universal, existing findings have already challenged this idea (Kanngiesser et al. 2015). Although it might be expected that differences between individualism and collectivism might be responsible for most cultural variation, things are likely to be more complicated because cultures vary on many dimensions. For example, many countries are culturally distant from both the United States and China, while also substantially differing from one another (Muthukrishna et al. 2020).

Another direction for future research is seeking to better understand the complexity and richness of children's judgments about ownership and value. With ownership, we outlined three guiding principles for determining ownership status: temporal precedence, control, and creation. But it is unclear whether and how these three principles actually organize children's thinking. For example, although attention to creation (and likewise history) might underlie (a) children's judgments that people own materials they have labored on and (b) children's default assumption that natural kinds are unowned, these judgments could have nothing to do with one another; children might instead draw on myriad low-level rules. Children's valuations of objects raise the opposite issue: Children's valuations have been explored with many different measures. For example, children have been asked about liking, owning, caring about, specialness, monetary worth, museum-worthiness, willingness-to-trade, and so on. A few studies have also found that children distinguish between some of these measures. But much more needs to be done to determine whether children truly have numerous distinct ways of conceptualizing value or instead have relatively few.

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Errata

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