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Article type : Research Dialogue

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Children, Object Value, and Persuasion

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Keywords: children, persuasion, essentialism, object history, value, ownership, authenticity, purity, contamination, scarcity, variety

ABSTRACT

We argue that, contrary to standard views of development, children understand the world in terms of hidden, non-obvious structure. We review research showing that early in childhood, items are not understood strictly in terms of the features that present themselves in the immediate 'here-and-now', but rather are thought to have a hidden reality. We illustrate with two related but distinct examples: category essentialism, and attention to object history. We discuss the implications of each of these capacities for how children determine object value. Across a broad range of object types (natural and artifactual, real and virtual, durable and consumable), an item is evaluated very differently, depending on inferred qualities and context. In this way, children's early-emerging conceptual frameworks influence how objects attain both psychological and monetary value, and may have important implications for which **This is the author manuscript accepted for publication and has undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the [Version of Record](#). Please cite this article as [doi: 10.1002/JCPY.1097](https://doi.org/10.1002/JCPY.1097)**

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messages children find most persuasive.

INTRODUCTION

Any economic exchange or system starts with a determination of object value. Whether trading baseball cards, selecting a brand of toothpaste, converting currency, or purchasing stocks, effective decision-making requires first establishing the value of the objects that surround us. We make these evaluations quickly and effortlessly, many times a day. We also have useful heuristics that often allow us to determine the value of an object at a glance. If all else were equal, we would place greater value on a plate of cookies vs. a single cookie, a functioning smartphone vs. one with a cracked screen, a brand-new car vs. an old rust-bucket. We have perceptual mechanisms for rapidly assessing amounts, cleanliness, functionality – all of which contribute to valuations.

Yet object value can be more than meets the eye. An item's value is not always gleaned from a glance, but rather may reflect features that are hidden, non-obvious, or altogether outside the object per se, such as its provenance, the effort that went into its creation, or the context in which it appears. Examples abound. Celebrity possessions, bottled mountain water, purebred pet breeds, and authentic works of art are all examples where valuation goes beyond an item's visible or functional properties (Bloom, 2010). In each case, there is a layer of added knowledge or beliefs that shift the item's meaning and value: its origins, who has owned it before, its lineage, its creator. These added layers help explain why one would offer \$5,300 on eBay for Scarlett Johansson's used tissue, pay for a bottle of Evian when a free refill of one's thermos is available from a drinking fountain in the same building, or pay tens of millions of dollars for an original O'Keefe, when a perfect reproduction can be had for a mere pittance.

What about children? Children are interesting to study for three primary reasons. First, examining children lends insight into the processes responsible for adult patterns of reasoning. It is often difficult, or even impossible, to determine how a preference emerges when it is already full-blown in the adult, but by examining the developmental process, we can learn its origins, and the mechanisms that contribute to how and why it emerges. Second and relatedly, children are the consumers of the future, so examining children provides an opportunity to study what sorts of interventions may lead to better outcomes (Kasser & Linn, 2016). For example, if we wish to teach children to be responsible consumers, it is important to know if certain early experiences lead children to be more open to financial education, or more at risk to ruinous decision-making. And third, a tremendous amount of resources go toward children—by parents, and by children themselves. Middle-income parents in the U.S. spend upwards of six figures per child, from birth through 17 years of age (Lino, Kuczynski, Rodriguez, & Schap, 2014). On average, toys alone account for roughly \$500 per year for children in the U.S. (NPD Group, n.d.). Children themselves make

purchasing decisions, boasting billions in spending power (Schor & Henderson, 2008). And companies in turn spend billions marketing to children (Horovitz, 2006). For all these reasons, it is important to know, for better or worse, what children find persuasive and of value.

Many theories characterize children as appearance-bound, concrete thinkers, reliant on surface features, unable to grasp abstractions, and limited to reasoning about the ‘here-and-now’ (e.g., Rakison & Oakes, 2003). Certainly, there is ample evidence to support such a view. Prior to about 6 or 7 years of age, children routinely fail to appreciate that physical quantities remain constant over irrelevant manipulations (Piaget, 1970). They often make judgments based on how things appear, rather than they are—for example, reporting that pouring liquid from a low, squat cup into a tall, thin beaker increases the amount of liquid, because it looks like more (as the height increases). Young children have a tendency to focus on salient features of objects, such as their shape (Lindau, Smith, & Jones, 1998), and are easily drawn to irrelevant environmental features (e.g., posters on the wall) even when they distract from the task at hand (e.g., learning a classroom science lesson) (Fisher, Godwin, & Seltman, 2014). Their preferences may lack refinement or sophistication (e.g., a preference for bright colors, sweet tastes, bouncy music, etc.) (Birch, 1990; LoBue & DeLoache, 2011; Ventura & Mennella, 2011).

But it would be wrong to infer that children’s evaluations are limited to considering only the most salient and obvious features of the world around them. From a remarkably young age, children can be subtle and discerning in their judgments. Indeed, toddlers are infamous for kicking up a fuss when items deviate even slightly from their preferences or expectations. For example, anecdotal reports suggest that children resist any modifications to their special attachment objects (such as a blanket or soft toy), even objecting when a parent washes or cleans the item (Winnicott, 1953). One parenting website notes (Yakomin, 2001): “As soon as your child shows an attachment to a toy or blanket, it’s wise to buy an identical spare. Just be sure to switch them off from time to time. Otherwise they won’t smell or feel the same, and your child will know the difference right away.” In the domain of food as well, picky eaters are notoriously sensitive to subtle variation in taste, texture, or even arrangement, for example refusing an otherwise palatable food if it makes contact with another food on their plate (Boquin, Smith-Simpson, Donovan, & Lee, 2014).

Our primary goal in this article is to review when, how, and why children are attuned to non-visible features of the objects in their world (using “objects” broadly to include animals, foods, artifacts, and ideas). We first focus on two conceptual orientations that underpin an early incorporation of the non-obvious: psychological essentialism and object history. After defining these concepts, we review a now considerable body of psychological evidence that these orientations emerge early in childhood. Then we discuss the implications of these findings for children’s evaluation of objects. These implications extend to notions of ownership, authenticity, purity, contamination, scarcity, and variety. We conclude that a

sensitivity to non-obvious features emerges early in childhood and permeates children's object evaluations. Finally, we summarize and point to important open issues.

ESSENTIALISM

Essentialism is a widely-held, intuitive belief that certain categories (especially natural kinds, such as tigers or gold, and some social categories, such as gender or race) have an underlying, non-obvious reality or true nature (Gelman, 2003). Why do wolves have sharp teeth, roam in packs, and howl at the moon? The essentialist response is that there is some inner quality that every wolf has that causes these features to emerge inevitably (Gelman, Meyer, & Noles, 2013). This "wolf essence" is assumed to be inherent and fixed at birth--perhaps residing in an animal's blood or genes (Dar-Nimrod & Heine, 2011; Heine et al., 2017), or perhaps even due to qualities that are currently unknown and have yet to be discovered (Medin, 1989). On this view, a seemingly innocent wolf cub will inevitably transform into a ferocious beast, even if it looks like a puppy, even if it's raised by humans, and even if it's wearing sheep's clothing. Note that our focus is strictly on how people think about categories (also known as "psychological essentialism"; Medin, 1989), and not metaphysical claims about the structure of the world (see Gelman, 2003; Wilkins, 2013, for other senses of "essentialism").

Essentialism can be a useful heuristic. The idea that appearances can be deceiving, and that underlying shared similarities are more central to an item's identity, is a basic insight that accords with generations of scientific discoveries regarding the natural world, ranging from gravitational waves, to genetic structure, to molecular compounds, to neural activation in the brain. Essentialism may encourage even young children to be curious about, and search for, underlying causal features to account for observed patterns in the everyday world (e.g., Why do caterpillars turn into butterflies? What makes boys and girls different?).

At the same time, essentialism is only a heuristic—and as with any heuristic, it oversimplifies and mischaracterizes the world (Gelman, 2003). For example, the essentialist assumption that a category is stable over time, and that outward visible changes are only superficial, leads people to underestimate how variable category members can actually be (even to the level of their genetics), and to misunderstand theories of evolution (Gelman & Rhodes, 2012; Gelman & Marchak, in press; Leslie, 2013; Shtulman & Calabi, 2012). Essentialist beliefs about social categories can be particularly misleading. For example, a nationally representative survey of 1,200 U.S. adults ages 18-90 found that most respondents endorsed false essentialist statements such as "Our genes tell us which race we belong to" and "Two people from the same race will always be more genetically similar to each other than two people from different races" (Christensen, Jayaratne, Roberts, Kardina, & Petty, 2010). Similarly, essentialism overestimates the role of causes inherent in individual category members, downplaying causes that are outside the individual, such as historical factors or structural inequalities (Cimpian & Salomon, 2014). It is thus perhaps not surprising

that essentialist reasoning in adults is linked to a variety of social consequences, including stereotyping and prejudice (Bastian & Haslam, 2006), biased categorization of multiracial individuals (Ho, Roberts, & Gelman, 2015), and gender and race imbalances in academia (Leslie, Cimpian, Meyer, & Freeland, 2015).

Importantly for current purposes, an extensive body of evidence has found that children, too, endorse essentialist beliefs, long before they have learned about biology or genes in school (Gelman, 2003, 2004; Gelman & Roberts, 2017). By 4-5 years of age, children judge that an animal can't change its category membership, even when it is modified to look like a different kind of animal (e.g., a porcupine can't turn into a cactus; Keil, 1989). They expect that members of the same category will have a wealth of non-obvious properties in common, even when category membership competes with appearances (e.g., a blackbird will feed its young the same kind of food as a flamingo, because they are both birds, but different food from a bat, because they are different kinds; Gelman & Davidson, 2013; Gelman & Markman, 1986). Children predict that an animal will resemble its birth parents more than its adopted parents (e.g., a cow raised with pigs will moo and have a straight tail; a boy raised exclusively with females will nonetheless have a desire to play football; Gelman & Wellman, 1991; Taylor, Rhodes, & Gelman, 2009). They treat category boundaries as objectively correct (e.g., the only correct way to group together a man and two women is to put the two women together, and it would not be OK to group the man with one of the women; Rhodes & Gelman, 2009). They judge that inherent, internal causes are critical to identity (Diesendruck, Gelman, & Lebowitz, 1998; Newman, Herrmann, Wynn, & Keil, 2008; Taborda-Osorio & Cheries, 2018).

Essentialist beliefs have been documented broadly across a range of cultural contexts with highly varied material cultures and society development, from rural Peruvian highlands to the Mongolian steppes to a fishing village in Madagascar (e.g., Astuti, Solomon, & Carey, 2004; Deeb et al., 2011; del Rio & Strasser, 2011; Gil-White, 2001; McIntosh, 2009; Moya, Boyd, & Henrich, 2015; Sousa, Atran, & Medin, 2002; Tsukamoto et al., 2015; Waxman, Medin, & Ross, 2007). Across these varied contexts, children and adults alike essentialize *animal* kinds (such as birds, dogs, or fish), though which *social* kinds children essentialize is considerably more variable (e.g., Rhodes & Mandalaywala, 2017). For example, the extent to which children essentialize Catholic vs. Protestant, Jewish vs. Arab, Brahmin vs. Dalit, or White vs. Black, varies as a function of the community in which they grow up. For example, children growing up in Northern Ireland treat religious categories (e.g., Catholic, Protestant) in essentialist ways that U.S. children living in Boston do not (Smyth et al., 2017); Israeli Jewish and Arab children are more likely to essentialize ethnicity if they attend mono-cultural versus integrated schools (Deeb et al., 2011); children growing up in a more racially and ethnically homogeneous, conservative community in Michigan developed stronger essentialist beliefs about gender and race than those growing up in a more racially and ethnically diverse, liberal community just one hour away (Rhodes & Gelman, 2009).

To summarize: psychological essentialism is an early-emerging assumption about natural categories. Adults and children alike readily construe the world in terms of hidden, non-obvious structure. Essentialism also often (though variably) extends to social kinds such as gender, race, ethnicity, or wealth (Kraus & Keltner, 2013). In contrast, essentialism does not appear to apply to artifacts: cups and tables do not have a biological basis, they do not have hidden innards, they do not have sharp boundaries, and they have quite limited inductive potential (Keil, 1989; Rhodes & Gelman, 2009). Nonetheless, non-obvious properties are important to artifacts as well, in how we think about object history. We turn to this point next.

OBJECT HISTORY

For 21st century adults, an object's history—where it is from, where it has been, and who has owned it—plays a powerful role in how we think about it. Consider, for example, a plain, white bag that Neil Armstrong used on his Apollo 11 mission to the moon, and that his widow discovered tucked away in their closet after his death. It is unremarkable in size or shape, somewhat discolored from dirt, with a simple zippered closure. Based on looks alone—revealing ordinary material, simple function, and dingy appearance—it is mundane at best, perhaps even edging toward trash. Yet it has been described thusly: “it is hard to imagine anything more exciting.” What transforms this object from ordinary to exciting is its history—it was on the moon, and indeed it participated in a historic event: the initial moon landing. This example illustrates the more general point, that how we think about an object is inseparable from what we know about its past. This is so for rare and expensive artifacts, such as the moon bag and original artwork (Bullock & Reber, 2013), as well as mundane items, such as a baby's favorite blanket (Gelman & Davidson, 2016). Whether an item is treasure or trash may rest not on its appearance or function, but its origins, and where it has been (cf. a lock of your child's baby hair vs. hair clippings on the barbershop floor). In one striking example, a work of art actually *gained* value after it was shredded, because the shredding was an audacious event initiated by the artist that was timed to take place immediately following its purchase at auction (Loughrey, 2018).

As noted earlier, object history is distinct from essentialism: object history is an acquired feature distinctive to an individual and applicable to artifacts, whereas essence is an inherent, inborn feature shared by all members of a natural category. Nonetheless, the two concepts have key similarities (Gelman, 2013; see also Newman, 2016, for an additional proposal linking essentialism to artifacts). Like essentialism, history is non-obvious (it can be difficult to detect whether a painting is original or a reproduction; Bloom, 2010), persistent (an object once associated with a negative owner or event has a taint that cannot be easily removed; Nemeroff & Rozin, 1994), and causally powerful (e.g., in some belief systems, contact with sacred objects has healing power; Gelman & Hirschfeld, 1999). Many aspects of adult reasoning reflect an attention to object history, including legal judgments (determining who has

rightful possession of an item), cultural institutions (including museum displays and sacred religious artifacts), psychiatric disorders (such as hoarding), and of course economic value (more on this later). People are able to detect history in objects at a glance—for example, upon seeing a dented can, they immediately infer a prior denting event (e.g., that the can was dropped; Leyton, 1992). They judge whether an item is authentic based on its provenance (Newman & Bloom, 2012). They have powerful emotional responses when an item has previously been in contact with a negative entity (e.g., Hitler; a cockroach) (Nemeroff & Rozin, 1994).

Importantly, starting early in development, children, too, are sensitive to object history. Preschool children use historical cues to make judgments regarding whether something is owned as well as who owns it. These cues include: who had the object first, who gave permission, which exchanges took place, and how much effort went into making it (e.g., Friedman, Neary, Defeyter, & Malcolm, 2011; Kanngiesser, Gjerse, & Hood, 2010). For example, 3- and 4-year-olds judged that a piece of clay that initially belonged to one person, would now belong to someone else, if that person had invested creative labor (e.g., transforming the clay from a duck to an elephant). Control conditions demonstrated that creative labor was critical to children's judgments, because merely holding the clay, or making a small action on it (e.g., cutting off a small piece) did not transfer ownership. When children invest creative labor in a toy, they also value it more highly (sometimes known as the IKEA effect; Marsh, Kanngiesser, & Hood, 2018).

Four- and five-year-old children also make the reverse inference: noting history to explain why someone owns something (Nancekivell & Friedman, 2014). Even when making judgments of what a given object is, children consider the process that went into its creation, specifically the creator's intent (Gelman & Bloom, 2000). For example, paint that was intentionally applied to a canvas is considered a painting, whereas paint that was accidentally spilled onto a canvas is not – even when the resulting image is identical. Object history, in the form of prior contact with a contaminated item, also affects preschool children's explanations and predictions. Preschoolers supply contamination-based explanations and invoke unseen mechanisms, such as germs or contact through bodily fluids, to account for biological consequences such as illness (Kalish, 1996; Legare, Wellman, & Gelman, 2009).

By 5-6 years of age, aspects of object history affect children's food choices as well (DeJesus, Shutts, & Kinzler, 2015). For example, DeJesus and colleagues presented children with two identical foods, one of which appeared to be contaminated (by sneezing or licking) and the other of which did not. Children were given 30 seconds to eat as much as they wished of each food, and then were asked to rate how 'yummy' each food was. Three- and four-year-old children did not differentiate the two foods, but by 5-6 years of age, children ate substantially more of the 'clean' food than the 'contaminated' food, and also rated the 'clean' food as much yummier than the 'contaminated' food.

Preschoolers also use spatiotemporal history, rather than appearance or proper name, as the basis for identity judgments (Gutheil, Gelman, Klein, Michos, & Kelaita, 2008). For example, 4- and 5-year-old children were introduced to two identical Winnie-the-Pooh dolls, one of which was in the room when the child drew a picture, and the other which was brought into the room only after the child had drawn the picture. When asked if the second doll knew what the child had drawn, they responded ‘no’—only the doll that had been in the room would have access to this knowledge, even though the dolls had the same name and same appearance.

In sum, children’s object concepts incorporate their knowledge of an object’s history, and this can be seen broadly in their judgments of ownership, categorization, identity, and causal reasoning. They see objects around them not merely as a collection of shapes, colors, affordances, and functions, but also as repositories of their history. Putting together the evidence from both essentialism and attention to object history, humans appear to have an early-emerging, domain-general capacity to represent the environment (human-constructed as well as natural) in terms of hypothesized, non-visible features.

IMPLICATIONS FOR OBJECT VALUE

To this point we have characterized children’s concepts as incorporating non-obvious features, including essences and object history. For the remainder of the paper we address the implications of this perspective for object value. Below we summarize the findings of controlled experiments that examine when and why non-obvious features inflate or deflate an object’s value relative to its material or functional worth. We explore this issue with regard to four interrelated set of concepts: ownership and investment; authenticity; purity and contamination; and scarcity and variety. Where available, we provide evidence from children; in other cases, we review findings with adults and point to where developmental evidence is lacking.

Ownership and investment

Ownership is a pure case of object history, invisibly linking object and owner by virtue of the past. Ownership does not inhere in an object, and cannot even be detected in an object, but rather derives from who made it, who bought it, or who received it as a gift. As Snare (1972) put it, “a stolen apple doesn’t look any different from any other” (p. 200).

Indirect evidence that ownership imparts value to young children can be seen in their efforts to track and enforce ownership relations. By preschool age, children demonstrate a keen attention to the unseen links between owners and possessions. For example, in one paradigm, young children (2, 3, and 4 years of age) were shown sets of objects, three at a time. First the researcher provided ownership information about each object (e.g., “This is yours; this is mine; look at this”), then the location of the objects was scrambled, as in a shell game, and finally the child was asked to point to which item was theirs and which was the researcher’s (Gelman, Manczak, & Noles, 2012; Gelman, Noles, & Stilwell,

2014; Noles, Gelman, & Stilwell, in press). By 3 years of age, children accurately pointed to which of the choices was theirs and which was the experimenter's—even when the three objects in the set were identical (e.g., three identical toy cars), or when the child had been assigned the least appealing object (e.g., a small, plain piece of wood, alongside two colorful plastic toys). Tagging an object with ownership information (e.g., “This is yours”) distinctively elicits these tracking behaviors; providing a non-ownership label (e.g., “This is a sarn”) does not (Gelman, Noles, & Stilwell, 2014). In this way, ownership information may bias children's allocation of attention (see also Ashby, Dickert, & Glöckner, 2012, for relevant data with adults).

In addition to tracking an object's spatiotemporal history, preschoolers search for hidden and invisible cues to its past (searching for hidden or invisible markings, akin to dusting for fingerprints) (Gelman, Manczak, Was, & Noles, 2016). For example, in one task, a researcher placed two identical objects (e.g., two disks) on a turntable, told the child that one of the objects was their own (“This is yours; this is for [child's name]”), pretended to mark it with a pencil in a hidden place (e.g., on its underside), and then covered up the display with a lid and spun the turntable so that the child could not use spatiotemporal tracking to determine which object was which. The researcher then lifted the lid and said, “Can you find which one is yours?” Children as young as three years of age searched for the hidden pencil mark, which was either hidden or altogether invisible (i.e., no mark was actually made). These traces were perceptually subtle (either hidden or altogether invisible), functionally insignificant, and not directly queried (e.g., the experimenter did not ask, “Which did I mark?”). Nonetheless, children actively attended to the differential histories of the items and spontaneously determined that they were relevant to ownership.

Ownership information also has consequences for how young children control and interact with objects. By three years, for example, children enforce the ownership rights of others, such as protesting a third party's misuse of an object (Rossano, Rakoczy, & Tomasello, 2011). In one study, an object (e.g., a hat) was explicitly labeled as belonging either to the child or to one of the experimenters, and then a puppet brazenly took the object without permission and placed it in his bag, and later still, the puppet threw the hat in the trash. Children expressed their displeasure by multiple means, including explicitly normative statements (e.g., “You must not do that”), imperative protests (e.g., “Leave the hat on the table”), physical protest (trying to grab the hat away from the puppet), or indirect implications (e.g., “Your mum gets angry”). Even when ownership rights would have no material consequences (e.g., the exchange of identical objects), children protest unauthorized exchanges, indicating their view that owned objects are non-fungible (McEwan, Pesowski, & Friedman, 2016), and this is so even when exchanges are mutual, accidental, or deceptive (Noles, Gelman, & Davidson, 2017).

Children's evaluations of objects are also directly influenced by their beliefs about ownership, as

well as how much time, energy, or creative labor has been invested in an object. One way this can be seen is with young children's attachment objects—typically soft items, such as blankets and plush toys, that are specially and intensely preferred above and beyond all others. Reports estimate that approximately 60% of middle-class children in the United States have non-social attachments objects, and by 4-5 years, many children believe that they have a shared history with their attachment object extending back to infancy (“I've always had Blankie”), and that they gave the object its name (Lehman, Arnold, & Reeves, 1995).

Work in this area has also shown that forming attachments to objects influences subsequent children's selections and evaluations among owned items and their replacements. For example, in one clever study, preschool-aged children were told of a duplicating machine that could make exact replicas of objects (Hood & Bloom, 2008). After seeing a demonstration with a lab toy, children were asked if they would prefer their own object (brought from home) or its exact duplicate. (Children had brought with them either their attachment object [if they had one], or any object from home that they liked [if they didn't have an attachment object].) Those without an attachment object tended to choose the duplicate of their toy from home, presumably due to its novelty and “wow” factor. In contrast, not only did 4-5-year-old children with an attachment object strongly prefer the original, but also most would not even let the experimenter place their attachment object in the machine. In a follow-up study, older children (6-7 years) were queried about non-attachment objects that either did or did not have a distinctive history. In that study, children placed higher values on non-attachment objects, but only when they had a distinctive, special history (e.g., British children preferred a metal spoon once owned by the Queen to its exact duplicate); not for objects that were also said to be special, but were lacking distinctive history (a spoon made of a precious metal versus its duplicate).

By three years of age, not only do children prefer an original object to its exact duplicate, they also prefer an old, visibly worn original object to a more attractive, brand-new replacement that was matched in type and features (e.g., old, scuffed, discolored stuffed animal vs. brand-new version of the same toy; Gelman & Davidson, 2016). Furthermore, they appreciate that this preference reflects a special person-object link, applying only to the child-owner and not to the researcher, whom they judged would prefer the newer object. Relatedly, children's preference for a favorite owned object seems related to their sense of self: experimentally increasing a child's self-worth via feedback on an experimental task led children to be more willing to part with the object, but had no effect on their willingness to part with ordinary, non-valuable objects (Diesendruck & Perez, 2015). Diesendruck and Perez (2015) also found that removing traces of the self by means of a thorough cleaning led children to be more willing to lend the favorite object to a morally negative character. Altogether, these findings suggest that for young children, owned objects are treated as containing components of the self, as has been argued for adults

(Belk, 1988).

The value of ownership has also been studied extensively with the endowment effect—the phenomenon whereby people ascribe greater value to items they own (Kahneman, Knetsch, & Thaler, 1990; see also Gal & Rucker, 2018, for debates regarding how to interpret this effect). Though the endowment effect has received much attention in adults, relatively less attention has been paid to the question of when this emerges in development. This is an important question, as it provides information regarding how foundational the endowment effect is, and what experiences are required for it to appear. Early work in this area with children observed the endowment effect in children as young as kindergarten, with no attenuation of the effect across the age range through adulthood (Harbaugh, Krause, & Vesterlund, 2001). In more recent work, children as young as two years were shown to prefer objects assigned to them more than those which were identical but not assigned to them (Gelman et al., 2012; Noles et al., in press). For example, when an experimenter provided a child with sets of three identical objects, labeled them with contrasting ownership information ("This is mine; this is yours; look at this"), and then scrambled their location, children who were 2, 3, or 4 years of age selected the one that had been assigned as belonging to them as the one they liked best. This result suggests that either an endowment effect or mere ownership effect may emerge in the preschool years. Other work has found that when 3- and 4-year-old children were primed to focus on the self by creating a self-portrait, they evaluated their own toys more positively as compared to a non-self-focused task (e.g., creating a picture of a friend, or of a farm scene) (Hood, Weltzien, Marsh, & Kanngiesser, 2016). Similarly, children show an 'IKEA effect' (Norton, Mochon, & Ariely, 2012), whereby they place greater value on items for which they have invested their own labor (Marsh, Kanngiesser, & Hood, 2018). For example, children who created a toy preferred it over an identical toy that they did not create; this effect was not obtained for a toy that they simply interacted with or drew a picture of (Marsh et al., 2018).

Even preparing one's own food leads children to consume more than another, equivalent food that was prepared by someone else (DeJesus, Gelman, Herold, & Lumeng, 2017). For example, in the study by DeJesus et al., parents brought children into lab where a researcher read aloud instructions for how to prepare a food by combining a set of prepared ingredients (e.g., for making a salad, children individually added into a bowl: chopped romaine lettuce, shredded carrots, cooked peas, croutons, and ranch dressing). Children were then presented with the serving of food that they had prepared and an identical serving that someone else had prepared, side-by-side, and were permitted to eat as much of each as they wanted. Children ate nearly twice as much of the food they had prepared than the other food—a finding that held up whether the food was a salad or a dessert (DeJesus, Gelman, Herold, & Lumeng, 2018).

In an increasingly digital world, where money and possessions may be virtual rather than

physically instantiated, it is of particular interest to examine whether ownership effects carry over to intangible items, such as ideas or information. This is an emerging field in which technology is rapidly changing and much has yet to be known. Intriguingly, however, by 6-8 years of age, children attribute ownership to ideas (Shaw, Li, & Olson, 2012), and by age 6, children prefer pictures containing their ideas to those containing their labor (Li, Shaw, & Olson, 2013). In one study, children 4 to 6 years of age heard a vignette about two girls, Sally and Anna, who each contributed to making a picture: one came up with the idea, and the other did the drawing. When asked who should get to take the picture home, 4-year-olds selected the person who drew the picture, but 6-year-olds selected the one who thought up the idea. However, it remains unclear how ownership over an idea influences its value relative to another idea. Is an idea subject to the same pricing asymmetry observed with tangible objects? Do we expend more energy defending a bad idea if it is ours, or show a reluctance to share it?

Relatedly, an open question is when and under what circumstances people have a sense of ownership over their personal data (Kamleitner & Mitchell, in press). In contrast to children's precocious attention to ownership of physical objects, and somewhat later but relatively early attention to ownership of ideas, it may take years for children to develop a sense of ownership of, and value in, their personal data, such as where their possessions are located. In a recent study, children 4-10 years of age and adults were asked whether it was okay for someone to use a mobile GPS device to track the location of possessions that were either their own or belonging to another (Gelman, Martinez, Davidson, & Noles, 2018). Although both children and adults viewed object tracking more acceptable for owners than nonowners, there was a stark developmental difference in their overall evaluations. Adults (but not children) viewed someone else tracking another person's possessions as bad. Adults expressed strong moral evaluations that people do not have the right to track possession belonging to another, whereas children focused more on the potential benefits of digital object tracking (e.g., being able to find a lost item). Children's acceptance of virtual object tracking may have implications for how children come to value information about others, a topic ripe for investigation given recent events and trends (e.g., targeted online manipulation techniques, "fake news").

Authenticity

Authenticity is an elusive, multi-faceted concept, yet illustrates the role of essence and object history in determining an item's value (Newman, 2016; Newman & Smith, 2016). Animals are authenticated by having the right "bloodlines" (AKC), artwork is authenticated by having the right provenance, and artifacts are authenticated by having participated directly in a significant prior event. The authentication of items is analogous to the chain of custody involving evidence in a criminal trial, requiring experts, documentation, and an unbroken connection to an invisible past.

That authentic objects are *valued* (and not simply perceived as different) can be seen in the

cultural practices, monetary valuations, and normative evaluations that accompany such items. For example, an original dish from the Titanic was placed on display in the Detroit Museum of Science; a strand of pearls once owned by Jacqueline Kennedy Onassis was sold by Sotheby's for many times their objective worth; and a stamp bearing the image of a replica Statue of Liberty (in Las Vegas), rather than the original, led to at least one outraged editorial calling for the stamp's cancellation (New York Daily News, 04.16.11). The price of jewelry reflects its origins, above and beyond its appearance (e.g., gold vs. pyrite) or even substance (natural vs. lab-produced diamond; natural vs. cultured pearl). Substances lacking these authentic origins are deemed "fake" or "not real". Similarly, items in the living world are commoditized based on their origins or familial roots, leading to purebred dogs costing thousands of dollars, or stud fees for racehorses that are upwards of a quarter of a million dollars. For brands of wines, heritage and pedigree are stated as important values (Beverland, 2006).

These judgments are not just the province of the elite, the snobbish, or those with money to burn. To the contrary, ordinary adults uniformly agree that a range of historical circumstances lend objects authenticity and higher valuations. In one study (Frazier et al., 2009), college students in the U.S. and England were asked to say how much a variety of authentic and inauthentic objects were worth, including original creations (e.g., the very first lightbulb), items linked to a famous event (e.g., a chunk of the Berlin Wall), spatially distant items (e.g., dust from Mars), temporally distant items (e.g., a one-penny piece from 1920), and items with notable ownership history (e.g., gum chewed by Britney Spears). Every authentic item was judged to be more valuable than an ordinary counterpart that was lacking in special history (e.g., the lightbulb over the kitchen table; a chewed-up piece of gum on the bottom of your chair; a piece of concrete from a local construction site).

The added value given to authentic objects cannot wholly be explained as a rational economic assessment of market forces, such as a monetary boost deriving from increased status (e.g., if I buy this authentic object, I will signal that I am a person of taste and refinement). People not only provided higher monetary assessments, but also reported that they more wanted to own and touch the authentic items—behaviors suggesting that the authentic objects have personal value (Frazier et al., 2009). Similarly, Newman, Diesendruck, and Bloom (2011) found that for celebrity memorabilia, sterilizing an item reduced its value, whereas priming contagion sensitivity increased its value. Again, these manipulations should not have affected value if this were a rational economic judgment; instead, they are consistent with the notion that an item's history persists in the object in some ineffable way. Similar judgments were seen in an analysis of actual celebrity auctions: the judged likelihood of physical contact between the celebrity and the item predicted how much people paid for it at auction – positive in the case of 'positive' celebrities (e.g., President John F. Kennedy), and negative in the case of the one 'negative' celebrity (Bernie Madoff) (Newman & Bloom, 2014). In short, people act as if an item's history carries with it an

invisible trace of its prior owner.

Children, too, place greater value on objects owned by a celebrity (Frazier & Gelman, 2009). In one study (Gelman, Frazier, Noles, Manczak, & Stilwell, 2015), children 4-12 years of age were asked how much people would pay for each of a series of items presented in pairs, matched in appearance but varying in authenticity (e.g., President Obama's flag pin vs. the experimenter's father's flag pin). The authentic objects included possessions of famous individuals with which children were familiar (e.g., a rubber ducky owned by Ernie from Sesame Street), original creations (e.g., the very first teddy bear), personal possessions (e.g., the participant's grandfather's baseball glove), and items that were merely old (e.g., an old book). By 5 years of age, young children consistently placed greater monetary value on celebrity possessions than their matched non-special counterpart. For example, the mean value children placed on the ordinary flag pin was \$98, whereas the mean value they placed on President Obama's flag pin was \$62,657. In contrast, they did not place any greater value on original creations (whereas adults did so), suggesting that contact with a special individual may be the foundation for the value placed on authentic objects. Similar developmental findings emerged when children were asked to judge which items belong in a museum, with preschoolers making this evaluation for objects owned by famous individuals, but the scope of authenticity broadening with age, to include original creations (kindergarten) and personal associations (fourth grade). This result could not be attributed to item desirability, as throughout the age range studied, children judged that even undesirable items belonged in a museum, if authentic. These findings demonstrate a nascent sense of authenticity, though many questions remain regarding the mechanisms underlying children's early sensitivity to items with famous owners, the mechanisms responsible for developmental change, and the source of cultural variation in these judgments (e.g., Gjersoe, Newman, Chituc, & Hood, 2014).

Purity and contamination

Eden foods, an organic food company based in the US, advertises as offering "authentic, organic, traditional, pure foods." As this example illustrates, the terms authenticity and purity may be used interchangeably, yet purity implies a distinctively moral component (Rottman & Kelemen, 2012). In this section we consider how moral considerations tied to concepts of purity and contamination affect item evaluations.

We start with perhaps the starkest intersection of contamination and morality, namely, the case of human body parts and substances. Although not legally for sale, and not products in the usual sense, bodily materials (e.g., blood transfusions, organ transplants, and genetic material) are of particular interest as they provide a direct test of whether people believe that a person's essence includes moral attributes. To the extent that moral qualities are part of a person's essence, they should be viewed as inherent within the individual, contained within their body, and causally powerful—hence, transferrable to others with the

transfer or transplantation of core internal parts. Perhaps surprisingly, given the absence of scientific basis for such beliefs, this indeed seems to be the case, both for many who actually receive transplants (e.g., Sanner, 2001) and those who have not. Thus, for example, adults are uncomfortable with the idea of receiving blood transfusions or organ transplants from someone with morally negative characteristics, such as a murderer (Hood, Gjersoe, Donnelly, Byers, & Itajkura, 2011; Meyer, Leslie, Gelman, & Stilwell, 2013), and both children and adults find it plausible that moral qualities of the donor (positive or negative) will be transmitted to the recipient (Meyer et al., 2013; Meyer, Gelman, Roberts, & Leslie, 2017). For example, in one study (Meyer et al., 2017), children 5-7 years of age were asked to consider a series of hypothetical vignettes in which they were asked what would happen if they were to swap hearts with another individual—either another animal (pig or monkey) or another person with a distinctive character trait (mean, nice, smart, or not-smart). To make the task child-friendly, participants were assured that the heart exchange didn't hurt. Across the full set of vignettes, children reported that if they were to receive the heart of another individual, they would take on that individual's characteristics. For example, if they received a mean child's heart, they would become meaner as a result (Meyer et al., 2013, 2017).

Turning to the domain of food, adults' judgments of naturalness and purity reflect an item's history—at times even more than content (Rozin, 2005). Foods that are natural, organic, and ethically sourced may receive a boost in value, whereas processed or genetically modified food (GMO) may invite suspicion. As with the work reviewed on organ transplants, these phenomena are of particular interest, given that people's beliefs and expectations may exceed known scientific differences. For example, GMOs are widely viewed as dangerous by the generic public, with concerns raised about health and environmental consequences, yet the scientific consensus is that they are not any less (or more) safe than other sorts of crops. It has been hypothesized that psychological essentialism contributes to these concerns (Blancke, Van Breusegem, De Jaeger, Braeckman, & Van Montagu, 2015). For example, people are warier of organisms that include DNA from distinct kinds (e.g., tomato/fish) than those including DNA from different subtypes within a kind (e.g., two kinds of tomato) (Gaskell et al., 2010), and often falsely believe that properties of the organism will carry over (e.g., agreeing with the statement, "Tomatoes modified with genes from a catfish would probably taste fishy"; Hallman et al., 2004). Opposition to GMOs is often moralized; for example, those who oppose GMOs often agree that they should be prohibited "no matter how great the benefits and minor the risks from allowing it" (Scott, Inbar, & Rozin, 2016).

The role of history in the evaluation of foods is a relatively recent area of research, and to our knowledge has not yet been examined developmentally. Given that even adults show substantial variability in their knowledge, beliefs, and support or opposition to different food origins, this raises

interesting questions regarding the source of such differences, and whether they are transmitted through conversations with parents, and/or through parental behaviors (e.g., the foods they buy). Given that children do not show disgust reactions until middle childhood (see Rottman, DeJesus, & Gerdin, 2018, for review), we may see a protracted development of purity and contamination effects on item value.

A final interesting case of contamination and moral evaluation involves money. Money is designed to be fungible—that is, to participate in exchanges that erase its origins and history. A dollar is a dollar, regardless of who used it last. Interestingly, however, even adults attend to the moral history of money, failing to treat money as just coldly instrumental. We see this in expressions such as “honest dollar” (one that is earned through hard work), “dirty money” (obtained through disreputable means), or “money laundering” (to erase traces of moral history). Extensive research shows that people’s mental accounting takes moral origins into consideration (Zelizer, 1994) and that evaluations of money are also affected by moral origins (Stellar & Willer, 2014). Moreover, adults’ judgments of money are thought to physically cling to the dollars that participated in the moral event (Tasimi & Gelman, 2017; Uhlmann & Zhu, 2013). For example, in one series of studies (Tasimi & Gelman, 2017), participants were asked to imagine that they had been offered a dollar that was stolen (“Frank found a stolen dollar in his desk. Frank says you can have the dollar, if you want.”), or a dollar that was not stolen but offered by a thief (“Paul stole a dollar from another person. The dollar that he stole is in his pocket. Paul has another dollar that he did not steal, in his desk. Paul says you can have the dollar in his desk, if you want.”). The moral history of the money (stolen or not) was judged to be more important than the morality of the giver (thief or not). Adults would rather have a “clean” dollar from a thief, than a stolen dollar that someone found—even in contexts where there would be no punishment or material consequences. In effect, they reported that if a thief were in possession of a ‘dirty’ dollar and a ‘clean’ dollar, these two bills would be importantly different. Strikingly, adults were generally accepting of taking a dollar from someone who stole a dollar. Additionally, increasing the offer from \$1 to \$100 had no effect on the likelihood of accepting a stolen dollar, though it did increase the likelihood that they would accept a physically dirty dollar, perhaps indicating the moral taint is absolute, whereas physical taint can be removed. Altogether, these results reveal that adults have a robust tendency to evaluate money based on its moral history. At the same time, it is notable that there were marked individual differences as well, with about half the participants rejecting the stolen money and about half accepting it. Moreover, developmental evidence suggests that this response does not emerge until about 8 years of age (Tasimi & Gelman, 2016). In future research it would be important to examine developmental, individual, and group-level factors that might increase or decrease sensitivity to purity and contamination in object evaluation.

Scarcity and variety

A final set of example of how an object’s value may extend beyond its apparent features concerns

the role of the context. The question we pose here is whether an item's context, in the form of the choices available, may systematically shift its value. To put it simply and concretely: are there contexts in which a child whose favorite color is blue nonetheless would prefer red over blue? We consider two sorts of contexts that have been proposed in the literature to play a role, namely scarcity and variety.

Scarcity refers to the relative infrequency of an item—either within the immediate context (e.g., 1 green marble in a bag that also contains 5 yellow marbles) or more broadly (e.g., a piece of Tanzanite, which is rare in the world). Commodity theory suggests that scarce items should be valued more than non-scarce items: “Any commodity will be valued to the extent that it is scarce, unavailable, or difficult to attain” (Brock, 1968, p. 246). Under a strict interpretation of this theory, the green marble in the example above should be valued more than the yellow marbles, given its relative scarcity; however, the evidence with adults is mixed (see Lynn, 1991, for a review). On the one hand, adults have been shown to prefer scarce items to more abundant options (e.g., Worchel, Lee, & Adewole, 1975); however, more often than not, some additional information (e.g., market concerns, such as demand or price) or personality lever is needed to boost values and selections. As one example of this, Verhallen and Robben (1994) found that adults placed higher values on popular scarce items vs. accidentally scarce items. In other cases, selection of scarce items has been linked to personality characteristics such as uniqueness seeking (Snyder & Fromkin, 1980).

We have conducted a series of experiments with children 4-12 years of age and adults, providing sets of novel objects and giving participants an opportunity to select one item for themselves or another person (Echelbarger & Gelman, 2017). Each set included two types of simple, novel artifacts (which we can refer to as A and B). On some trials one item was scarce (e.g., 1 A and 5 Bs, or 2 As and 4 Bs); on other trials, neither item was scarce (e.g., 3As and 3Bs). (Which item was scarce vs. abundant was counterbalanced across sets and across participants.) No other information was provided about the items. If children have an intuitive tendency to value scarce items, then they should have consistently selected the scarce item above chance. However, we found little evidence for a scarcity preference—in children or adults. The only context in which scarcity was preferred (and then only weakly) was in the context of social comparison: when items were maximally scarce (5:1 ratio), participants were more likely to select the scarce item for themselves than for someone else—though still at low rates.

We propose that children are not motivated to select scarcity in and of itself (i.e., there is not a direct motivation for scarcity), but rather that scarcity may emerge as a result of other factors (i.e., it is a derived motivation). For example, scarcity may be valued in contexts that signal that a scarce item is authentic, prestigious, or a sign of one's own uniqueness. Similarly, scarcity may obtain value when the underlying market forces are explicitly provided. For example, preliminary evidence from our lab suggests that children may reason that items that are scarce due to their popularity are more valuable than

items that are scarce due to an accidental break in the supply chain (Echelbarger & Gelman, 2018). Another derived motivation may stem from the fact that in some cases, selection of a scarce item is confounded with selection of a varied set of items (e.g., Chernyak & Sobel, 2016). We turn next to variety.

In sharp contrast to children's relative indifference to scarcity per se, we have found evidence for a powerful variety preference in young children (Echelbarger & Gelman, 2017). By variety, we mean selecting differences among items within sets. For example, a set containing yellow and green marbles is more varied than a set containing just green marbles. Appeals to variety are well-documented in adults (see Kahn, 1995, for a review), who have been shown to prefer variety, even in cases where it requires foregoing some preferred experience (e.g., Read & Loewenstein, 1995). For example, when given an opportunity to pick two candies, when the choices included both Snickers and Twix, adults typically picked one of each, even when explicitly providing a preference for one (e.g., "I was considering past experiences with the candy bars, and I took into consideration my enjoyment of Snickers more than Twix.") (Mittelman, Andrade, Chattopadhyay, & Brendl, 2014). Similarly, when children 4-12 years were shown the same displays described above in the scarcity studies (e.g., a combination of novel artifacts of two types), they consistently selected varied to non-varied sets (e.g., select A and B much more often than either two As or two Bs). In ongoing work, we further found that children 6-9 years assign higher monetary values to varied sets vs. non-varied sets (Echelbarger, Gelman, & Maimaran, 2018). However, this preference for variety is not limitless. In other recent work, we have found that children (and adults) will not forego an additional unit of a preferred food item to obtain a varied set of foods when one food item is preferred to another (Echelbarger et al., 2018). Thus, a child who values broccoli and carrot sticks equally will typically select one serving of each, but a child who prefers carrot sticks will typically select two servings of carrots. Thus, children's use of variety as a cue to value (or as a decision heuristic) is weighed against other existing preferences in children as young as 4 years.

Taken together, scarcity and variety exert influence over item value, operating outside the properties inherent to an item itself. In the case of scarcity, though preliminary, evidence suggests that scarcity operates as a derived motivation that affects preferences in children and adults when combined with additional relevant cues (e.g., authenticity, market demand), scarcity can influence preference in both children and adults. Variety also influences preference, though apparently as a direct rather than derived motivation. As our work has shown, children as young as 4-5 years strongly prefer variety, even in the absence of information about the items selected themselves, and children as young as 6-9 years place higher values on varied versus non-varied sets of items. Knowing whether and when children appeal to scarcity and variety offers opportunities to promote better decision-making in childhood. For example, Albuquerque and colleagues (2018) suggest that offering varied foods may promote children's

consumption of healthy foods. In this way, continued research examining scarcity and variety as cues to value offers both basic and applied insights.

CONCLUSIONS

We have reviewed a rich set of construals that affect object evaluations, including: ownership, endowment, authenticity, purity, contamination, scarcity, and variety. Considerations of unseen essence, invisible history, and context affect how much people evaluate or are willing to pay for items across a broad range of domains (natural and artifactual, real and virtual, durable and consumable). This framework can explain a wide range of seemingly unrelated behaviors among adults: why dog-owners pay more for a purebred than a mutt (even though mixing breeds tends to be healthier), why foodies pay extra for organic versus conventionally farmed foods (even though the former may be smaller or more worm-bitten), why Portlanders saved swatches of used airport carpeting that had sentimental value but no functional utility, or why residents of Sandy Hook razed functional buildings that were costly to build but were the site of a horrendous crime.

Strikingly, the roots of these behaviors can be found in early childhood. From as early as 4-5 years of age, an item's value is not limited to its material qualities or functional utility. In this way, children's early-emerging conceptual frameworks have important implications for how objects attain both psychological and monetary value. The valuation of objects thus cannot be understood strictly in terms of a theoretical framework focusing entirely on objective outward features of objects considered in isolation, such as color, size, behaviors, and/or functions. That these expectations emerge in early childhood suggest that essence, history, and context are foundational to how people interact with and value items.

Indeed, we suspect that the sensitivities that we have reviewed are just the tip of the iceberg. A highly promising direction for future research is to examine how social learning provides a rich source of inferences about object value that extend beyond the item's material qualities (e.g., Job, Nikitin, Zhang, Carr, & Walton, 2017). These may include social status (e.g., Gülgöz & Gelman, 2017), social categories (Gaither, Chen, Corriveau, Harris, Ambady, & Sommers, 2014; Roberts, Gelman, & Ho, 2017), adult testimony (DeJesus, Shutts, & Kinzler, 2017; Lumeng et al., 2008), and modeling by others (Fawcett & Markson, 2010; Frazier, Gelman, Kaciroti, Russell, & Lumeng, 2012).

How can we reconcile these findings with children's well-documented attention to salient perceptual features of objects? We think three points are important here. First, although we have focused on children's early-emerging sensitivities, the research literature also indicates important developmental changes. At the very least, the scope and influence of hidden features, as well as the incorporation of additional factors (e.g., market forces) increase as children get older. We have already briefly touched on a few of these developments (e.g., in children's sensitivity to authenticity, the moral history of money, and attention to digital privacy concerns), though certainly more studies are needed. Second and relatedly,

an early attention to essence and object history does not mean that children pay no attention to more salient observable features. Children are both theorists and data-analysts (Waxman & Gelman, 2009), and outward appearances are striking in their own right, as well as predictive of deeper qualities (Diesendruck & Bloom, 2003). A growth area for future study is how children integrate both perceptible and hidden properties in their object evaluations. But third and finally, the capacity to reason about non-obvious aspects of experience is arguably more foundational than previously believed. For a species that is smart by being adaptive and open to cultural learning and social transmission of knowledge (Tomasello, 2009), it is functionally beneficial for children to focus on underlying causes rather than outcomes alone, to search for hidden commonalities or new features, and to look for cues in their social environment.

Implications for persuasion

Children's openness to non-obvious aspects of experience has important implications for which messages and framings they will find most persuasive. Throughout this review, we have focused primarily on object value, which has obvious connections to the persuasive marketing of products for purchase. For example, we reviewed extensive evidence that children value authenticity, which suggests that they will be persuaded by marketing that indicates that an item is authentic—real, rare, one-of-a-kind, or otherwise not a 'mere' copy, and that they value history, which suggests that they will be persuaded by marketing that indicates that an item was owned or used by a high-status or well-respected individual.

However, there are many goals of persuasion that extend beyond marketing of products to include (for example) increasing healthy and safe choices, communicating the value of education, encouraging growth mindsets, improving financial literacy, considering privacy implication of digital devices, and fostering positive societal values, such as increasing environmental awareness or reducing prejudice and stereotyping. Here, too, the literature we have reviewed suggests that young children do not simply rely on the loudest, brightest, simplest, or catchiest message, but are capable of discerning value based on more sophisticated and meaningful cues.

Take, for example, the goal of increasing children's selection of healthy and varied foods in their diet. Persuading children to eat healthy is again open to multiple, subtle influences. As reviewed earlier, children are more willing to eat a salad if they had prepared it themselves (DeJesus et al., 2018), reflecting their attention to its origins and history. They are more willing to try a food if it was modeled by an individual that the child sees as "like me" – for example, same age or same gender (Frazier et al., 2012), reflecting their attention to social categories. Children eat more vegetables if they are provided with a clearly articulated causal framework for understanding why eating more varied foods (including vegetables) is beneficial for the body (Gripshover & Markman, 2013), indicating their interest in underlying causes and not just superficial features. Children attend to the context in which a choice is provided, and thus are more likely to select a varied choice of foods over a less varied set, potentially

increasing the consumption of more healthy choices (Just, Lund, & Price, 2012; Roe et al., 2013). Finally, children are highly sensitive to how a message is framed, so that (for example) preschool age children rate food framed as yummy more tasty than food presented as healthy (Maimaran & Fishbach, 2014), and statements that are expressed as a broad generalization (“That’s how you do it”) imply that the behavior is more normatively correct than statements that are expressed as a specific statement (“That’s how I do it”) (Orvell, Kross, & Gelman, 2018).

Going forward, we believe that a developmental approach will be most fruitful to determine when children are most sensitive to the many and varied messages they hear about the world around them—messages that guide their choices, behaviors, and values.

REFERENCES

- Albuquerque, P., Brucks, M., Campbell, M. C., Chan, K., Maimaran, M., McAlister, A. R., & Nicklaus, S. (2018). Persuading children: A framework for understanding long-lasting influences on children’s food choices. *Customer Needs and Solutions*, 5(1-2), 38-50.
- Ashby, N. J., Dickert, S., & Glöckner, A. (2012). Focusing on what you own: Biased information uptake due to ownership. *Judgment and Decision Making*, 7(3):254–267.
- Astuti, R., Solomon, G. A., & Carey, S. (2004). Constraints on conceptual development: I. Introduction. *Monographs of the Society for Research in Child Development*, 69, 1-24.
- Bastian, B., & Haslam, N. (2006). Psychological essentialism and stereotype endorsement. *Journal of Experimental Social Psychology*, 42(2), 228-235.
- Belk, R. W. (1988). Possessions and the extended self. *Journal of Consumer Research*, 15, 139-167.
- Beverland, M. B. (2006). The ‘real thing’: branding authenticity in the luxury wine trade. *Journal of Business Research*, 59, 251-258.
- Birch, L. L. (1990). Development of food acceptance patterns. *Developmental Psychology*, 26(4), 515-519.
- Blancke, S., Van Breusegem, F., De Jaeger, G., Braeckman, J., & Van Montagu, M. (2015). Fatal attraction: the intuitive appeal of GMO opposition. *Trends in Plant Science*, 20(7), pp. 414-418.
- Bloom, P. (2010). *How pleasure works: The new science of why we like what we like*. Random House.
- Boquin, M., Smith-Simpson, S., Donovan, S. M., & Lee, S. Y. (2014). Mealtime behaviors and food consumption of perceived picky and nonpicky eaters through home use test. *Journal of Food Science*, 79(12).

- Brock, T. C. (1968). Implications of commodity theory for value change. In A. G. Greenwald, T. C. Brock, & T. M. Ostrom (Eds.), *Psychological foundations of attitudes* (pp. 243- 275). New York: Academic Press.
- Bulot, N. J., & Reber, R. (2013). The artful mind meets art history: Toward a psycho-historical framework for the science of art appreciation. *Behavioral and Brain Sciences*, *36*(2), 123-137.
- Chernyak, N., & Sobel, D. M. (2015). Equal but not always fair: Value-laden sharing in preschool-aged children. *Social Development*, *25*, 340-351.
- Christensen, K. D., Jayaratne, T. E., Roberts, J. S., Kardia, S. L. R., & Petty, E. M. (2010). Understandings of basic genetics in the United States: results from a national survey of black and white men and women. *Public Health Genomics*, *13*(7-8), 467-476.
- Cimpian, A., & Salomon, E. (2014). The inherence heuristic: An intuitive means of making sense of the world, and a potential precursor to psychological essentialism. *Behavioral and Brain Sciences*, *37*(5), 461-480.
- Dar-Nimrod, I., & Heine, S. J. (2011). Genetic essentialism: on the deceptive determinism of DNA. *Psychological Bulletin*, *137*(5), 800-818.
- Deeb, I., Segall, G., Birnbaum, D., Ben-Eliyahu, A., & Diesendruck, G. (2011). Seeing isn't believing: The effect of intergroup exposure on children's essentialist beliefs about ethnic categories. *Journal of Personality and Social Psychology*, *101*(6), 1139-1156.
- DeJesus, J. M., Gelman, S. A., Herold, I., & Lumeng, J. C. (2017, October). *Children eat more food when they prepare it themselves*. Poster presented at the Biennial Meeting of the Cognitive Development Society, Portland, OR.
- DeJesus, J. M., Shutts, K., & Kinzler, K. D. (2015). Eww she sneezed! Contamination context affects children's food preferences and consumption. *Appetite*, *87*, 303-309.
- DeJesus, J. M., Shutts, K., & Kinzler, K. D. (2017). Mere social knowledge impacts children's consumption and categorization of foods. *Developmental Science*, e12627.
- del Río, M. F., & Strasser, K. (2011). Chilean children's essentialist reasoning about poverty. *British Journal of Developmental Psychology*, *29*(4), 722-743.
- Diesendruck, G., & Bloom, P. (2003). How specific is the shape bias? *Child Development*, *74*(1), 168-178.
- Diesendruck, G., Gelman, S. A., & Lebowitz, K. (1998). Conceptual and linguistic biases in children's word learning. *Developmental Psychology*, *34*(5), 823-839.
- Diesendruck, G., & Perez, R. (2015). Toys are me: Children's extension of self to objects. *Cognition*, *134*, 11-20.
- Echelbarger, M., & Gelman, S. A. (2017). The value of variety and scarcity across development. *Journal*

- of Experimental Child Psychology, 156*, 43-61.
- Echelbarger, M., & Gelman, S. A. (2018). *Developmental origins of market force understanding*. Unpublished ms.
- Echelbarger, M., Gelman, S. A., & Maimaran, M. (2018). Variety seeking in childhood. In preparation.
- Fawcett, C. A., & Markson, L. (2010). Children reason about shared preferences. *Developmental Psychology, 46*(2), 299-309.
- Fisher, A. V., Godwin, K. E., & Seltman, H. (2014). Visual environment, attention allocation, and learning in young children: When too much of a good thing may be bad. *Psychological Science, 25*(7), 1362-1370.
- Frazier, B. N., & Gelman, S. A. (2009). Developmental changes in judgments of authentic objects. *Cognitive Development, 24*(3), 284-292.
- Frazier, B. N., Gelman, S. A., Wilson, A., & Hood, B. M. (2009). Picasso paintings, moon rocks, and hand-written Beatles lyrics: Adults' evaluations of authentic objects. *Journal of Cognition and Culture, 9*(1), 1-14.
- Frazier, B. N., Gelman, S. A., Kaciroti, N., Russell, J. W., & Lumeng, J. C. (2012). I'll have what she's having: The impact of model characteristics on children's food choices. *Developmental Science, 15*(1), 87-98.
- Friedman, O., Neary, K. R., Defeyter, M. A., & Malcolm, S. L. (2011). Ownership and object history. *New Directions for Child and Adolescent Development, 132*, 79-89.
- Gaither, S. E., Chen, E. E., Corriveau, K. H., Harris, P. L., Ambady, N., & Sommers, S. R. (2014). Monoracial and biracial children: Effects of racial identity saliency on social learning and social preferences. *Child Development, 85*(6), 2299-2316.
- Gal, D., & Rucker, D. D. (2018). The loss of loss aversion: Will it loom larger than its gain? *Journal of Consumer Psychology*.
- Gaskell, G., Stares, S., Allansdottir, A., Allum, N., & Castro, P. (2010). Europeans and Biotechnology in 2010: Winds of change? A report to the European Commission's Directorate-General for Research on the Eurobarometer 73.1 on Biotechnology, FP7 project, 'Sensitive Technologies and European Public Ethics' (STEPE).
- Gelman, S. A. (2003). *The essential child: Origins of essentialism in everyday thought*. New York: Oxford University Press.
- Gelman, S. A. (2004). Psychological essentialism in children. *Trends in Cognitive Sciences, 8*(9), 404-409.
- Gelman, S. A. (2013). Artifacts and essentialism. *Review of Philosophy and Psychology, 4*(3), 449-463.
- Gelman, S. A., & Bloom, P. (2000). Young children are sensitive to how an object was created when

- deciding what to name it. *Cognition*, 76(2), 91-103.
- Gelman, S. A., & Davidson, N. S. (2013). Conceptual influences on category-based induction. *Cognitive Psychology*, 66(3), 327-353.
- Gelman, S. A., & Davidson, N. S. (2016). Young children's preference for unique owned objects. *Cognition*, 155, 146-154.
- Gelman, S. A., Frazier, B. N., Noles, N. S., Manczak, E. M., & Stilwell, S. M. (2015). How much are Harry Potter's glasses worth? Children's monetary evaluation of authentic objects. *Journal of Cognition and Development*, 16(1), 97-117.
- Gelman, S. A., & Hirschfeld, L. A. (1999). How biological is essentialism? In S. Atran & D. Medin (Eds.), *Folk biology*. Cambridge, MA: MIT Press.
- Gelman, S. A., Manczak, E. M., & Noles, N. S. (2012). The nonobvious basis of ownership: Preschool children trace the history and value of owned objects. *Child Development*, 83(5), 1732-1747.
- Gelman, S. A., Manczak, E. M., Was, A. M., & Noles, N. S. (2016). Children seek historical traces of owned objects. *Child Development*, 87(1), 239-255.
- Gelman, S. A., & Marchak, K. A. (in press). How does intuition mislead? The role of human bias in scientific inquiry. In K. McCain & K. Kampourakis (Eds.), *What is scientific knowledge? An introduction to contemporary epistemology of science*. Routledge.
- Gelman, S. A., & Markman, E. M. (1986). Categories and induction in young children. *Cognition*, 23, 183-209.
- Gelman, S. A., Martinez, M., Davidson, N. S., & Noles, N. S. (2018). Developing digital privacy: Children's moral judgments concerning mobile GPS devices. *Child Development*, 89(1), 17-26.
- Gelman, S. A., Meyer, M. A., & Noles, N. S. (2013). History and essence in human cognition. *Behavioral and Brain Sciences*, 36(2), 142-143.
- Gelman, S. A., Noles, N. S., & Stilwell, S. (2014). Tracking the actions and possessions of agents. *Topics in Cognitive Science*, 6(4), 599-614.
- Gelman, S. A., & Rhodes, M. (2012). "Two-thousand years of stasis": How psychological essentialism impedes evolutionary understanding. In K. S. Rosengren, S. Brem, E. M. Evans, & G. Sinatra (Eds.), *Evolution challenges: Integrating research and practice in teaching and learning about evolution*. Cambridge: Oxford University Press.
- Gelman, S. A., & Roberts, S. O. (2017). How language shapes the cultural inheritance of categories. *Proceedings of the National Academy of Sciences*, 114(30), 7900-7907.
- Gelman, S. A., & Wellman, H. M. (1991). Insides and essences: Early understandings of the nonobvious. *Cognition*, 38(3), 213-244.
- Gil-White, F. J. (2001). Are ethnic groups biological "species" to the human brain? *Current*

- Anthropology*, 42, 515-554.
- Gjersoe, N. L., Newman, G. E., Chituc, V., & Hood, B. (2014). Individualism and the extended-self: Cross-cultural differences in the valuation of authentic objects. *PLoS One*, 9(3), e90787.
- Gripshover, S. J., & Markman, E. M. (2013). Teaching young children a theory of nutrition: Conceptual change and the potential for increased vegetable consumption. *Psychological Science*, 24(8), 1541-1553.
- Gülgöz, S., & Gelman, S. A. (2017). Who's the boss? Concepts of social power across development. *Child Development*, 88(3), 946-963.
- Gutheil, G., Gelman, S. A., Klein, E., Michos, K., & Kelaita, K. (2008). Preschoolers' use of spatiotemporal history, appearance, and proper name in determining individual identity. *Cognition*, 107(1), 366-380.
- Hallman, W. K., Hebden, W. C., Cuite, C. L., Aquino, H. L., & Lang, J. T. (2004). Americans and GM food: Knowledge, opinion, and interest in 2004. (Publication number RR-1104-007). New Brunswick, New Jersey; Food Policy Institute, Cook College, Rutgers - The State University of New Jersey.
- Harbaugh, W. T., Krause, K., & Vesterlund, L. (2001). Are adults better behaved than children? Age, experience, and the endowment effect. *Economics Letters*, 70, 175-181.
- Heine, S. J., Dar-Nimrod, I., Cheung, B. Y., & Proulx, T. (2017). Essentially biased: Why people are fatalistic about genes. In *Advances in Experimental Social Psychology* (Vol. 55, pp. 137-192). Academic Press.
- Ho, A. K., Roberts, S. O., & Gelman, S. A. (2015). Essentialism and racial bias jointly contribute to the categorization of multiracial individuals. *Psychological Science*, 26(10), 1639-1645.
- Hood, B. M., & Bloom, P. (2008). Children prefer certain individuals over perfect duplicates. *Cognition*, 106(1), 455-462.
- Hood, B. M., Gjersoe, N. L., Donnelly, K., Byers, A., & Itajkura, S. (2011). Moral contagion attitudes towards potential organ transplants in British and Japanese adults. *Journal of Cognition and Culture*, 11(3-4), 269-286.
- Hood, B., Weltzien, S., Marsh, L., & Kanngiesser, P. (2016). Picture yourself: Self-focus and the endowment effect in preschool children. *Cognition*, 152, 70-77.
- Horovitz, B. (2006). Six strategies marketers use to get kids to want stuff bad. In *USA Today*. Retrieved June 29, 2018, from http://www.usatoday.com/money/advertising/2006-11-21-toy-strategies-usat_x.htm.
- Job, V., Nikitin, J., Zhang, S. X., Carr, P. B., & Walton, G. M. (2017). Social traces of generic humans increase the value of everyday objects. *Personality and Social Psychology Bulletin*, 43(6), 785-

792.

- Just, D. R., Lund, J., & Price, J. (2012). The role of variety in increasing the consumption of fruits and vegetables among children. *Agricultural and Resource Economics Review*, *41*(1), 72-81.
- Kahn, B. E. (1995). Consumer variety-seeking among goods and services: An integrative review. *Journal of Retailing and Consumer Services*, *2*(3), 139-148.
- Kahneman, D., Knetsch, J. L., & Thaler, R. H. (1991). Anomalies: The endowment effect, loss aversion, and status quo bias. *Journal of Economic Perspectives*, *5*(1), 193-206.
- Kalish, C. W. (1996). Preschoolers' understanding of germs as invisible mechanisms. *Cognitive Development*, *11*(1), 83-106.
- Kamleitner, B., & Mitchell, V.-W. (in press). Can consumers experience ownership for all their personal data? From issues of scope and invisibility to agents handling our digital blueprints. In J. Peck & S. Shu (Eds.), *Psychological Ownership*. Springer.
- Kanngiesser, P., Gjersoe, N., & Hood, B. M. (2010). The effect of creative labor on property-ownership transfer by preschool children and adults. *Psychological Science*, *21*(9), 1236-1241.
- Kasser, T., & Linn, S. (2016). Growing up under corporate capitalism: The problem of marketing to children, with suggestions for policy solutions. *Social Issues and Policy Review*, *10*(1), 122-150.
- Keil, F. (1989). *Concepts, kinds, and cognitive development*. Cambridge, MA: Bradford Book/MIT Press.
- Kraus, M. W., & Keltner, D. (2013). Social class rank, essentialism, and punitive judgment. *Journal of Personality and Social Psychology*, *105*(2), 247-261.
- Landau, B., Smith, L. B., & Jones, S. S. (1988). The importance of shape in early lexical learning. *Cognitive Development*, *3*(3), 299-321.
- Legare, C. H., Wellman, H. M., & Gelman, S. A. (2009). Evidence for an explanation advantage in naïve biological reasoning. *Cognitive Psychology*, *58*(2), 177-194.
- Lehman, E. B., Arnold, B. E., & Reeves, S. L. (1995). Attachments to blankets, teddy bears, and other nonsocial objects: A child's perspective. *The Journal of Genetic Psychology*, *156*(4), 443-459.
- Leslie, S. J. (2013). Essence and natural kinds: When science meets preschooler intuition. *Oxford Studies in Epistemology*, *4*, 109-165.
- Leslie, S. J., Cimpian, A., Meyer, M., & Freeland, E. (2015). Expectations of brilliance underlie gender distributions across academic disciplines. *Science*, *347*(6219), 262-265.
- Leyton, M. (1992). *Symmetry, causality, mind*. Cambridge, MA: The MIT Press.
- Li, V., Shaw, A., & Olson, K. R. (2013). Ideas versus labor: What do children value in artistic creation? *Cognition*, *127*(1), 38-45.
- Lino, M., Kuczynski, K., Rodriguez, N., & Schap, T. (2014). *Expenditures on children by families, 2013*.

- Center for Nutrition Policy and Promotion, US Department of Agriculture.
- LoBue, V., & DeLoache, J. S. (2011). Pretty in pink: The early development of gender-stereotyped colour preferences. *British Journal of Developmental Psychology*, *29*(3), 656-667.
- Loughfrey, C. (2018). Banksy artwork 'doubles in value' after being shredded in front of stunned buyers at Sotheby's auction. *The Independent* (October 6, 2018). <https://www.independent.co.uk/arts-entertainment/art/news/banksy-artwork-doubles-value-self-destruct-shred-girl-with-red-balloon-sothebys-a8571976.html> (retrieved October 14, 2018)
- Lumeng, J. C., Cardinal, T. M., Jankowski, M., Kaciroti, N., & Gelman, S. A. (2008). Children's use of adult testimony to guide food selection. *Appetite*, *51*(2), 302-310.
- Lynn, M. (1991). Scarcity effects on value: A quantitative review of the commodity theory literature. *Psychology and Marketing*, *8*(1), 43-57. doi: 10.1002/mar.4220080105
- Maimaran, M., & Fishbach, A. (2014). If it's useful and you know it, do you eat? Preschoolers refrain from instrumental food. *Journal of Consumer Research*, *41*(3), 642-655.
- Marsh, L. E., Kanngiesser, P., & Hood, B. (2018). When and how does labour lead to love? The ontogeny and mechanisms of the IKEA effect. *Cognition*, *170*, 245-253.
- McEwan, S., Pesowski, M. L., & Friedman, O. (2016). Identical but not interchangeable: Preschoolers view owned objects as non-fungible. *Cognition*, *146*, 16-21.
- McIntosh, J. (2009). *The edge of Islam: Power, personhood, and ethnoreligious boundaries on the Kenya Coast*. Durham, NC: Duke University Press.
- Medin, D. L. (1989). Concepts and conceptual structure. *American Psychologist*, *44*(12), 1469.
- Meyer, M., Gelman, S. A., Roberts, S. O., & Leslie, S. J. (2017). My heart made me do it: Children's essentialist beliefs about heart transplants. *Cognitive Science*, *41*(6), 1694-1712.
- Meyer, M., Leslie, S. J., Gelman, S. A., & Stilwell, S. M. (2013). Essentialist beliefs about bodily transplants in the United States and India. *Cognitive Science*, *37*(4), 668-710.
- Mittelman, M., Andrade, E. B., Chattopadhyay, A., & Brendl, C. M. (2014). The offer framing effect: Choosing single versus bundled offerings affects variety seeking. *Journal of Consumer Research*, *41*(4), 953-964.
- Moya, C., Boyd, R., & Henrich, J. (2015). Reasoning about cultural and genetic transmission: Developmental and cross-cultural evidence From Peru, Fiji, and the United States on how people make inferences about trait transmission. *Topics in Cognitive Science*, *7*(4), 595-610.
- Nancekivell, S. E., & Friedman, O. (2014). Preschoolers selectively infer history when explaining outcomes: Evidence from explanations of ownership, liking, and use. *Child Development*, *85*, 1236-1247.
- Nemeroff, C., & Rozin, P. (1994). The contagion concept in adult thinking in the United States:

- Transmission of germs and of interpersonal influence. *Ethos*, 22(2), 158-186.
- Newman, G. E. (2016). An essentialist account of authenticity. *Journal of Cognition and Culture*, 16(3-4), 294-321.
- Newman, G. E., & Bloom, P. (2012). Art and authenticity: The importance of originals in judgments of value. *Journal of Experimental Psychology: General*, 141(3), 558.
- Newman, G. E., & Bloom, P. (2014). Physical contact influences how much people pay at celebrity auctions. *Proceedings of the National Academy of Sciences*, 111(10), 3705-3708.
- Newman, G. E., Diesendruck, G., & Bloom, P. (2011). Celebrity contagion and the value of objects. *Journal of Consumer Research*, 38(2), 215-228.
- Newman, G. E., Herrmann, P., Wynn, K., & Keil, F. C. (2008). Biases towards internal features in infants' reasoning about objects. *Cognition*, 107(2), 420-432.
- Newman, G. E., & Smith, R. K. (2016). Kinds of authenticity. *Philosophy Compass*, 11(10), 609-618.
- Noles, N. S., Gelman, S. A., & Davidson, N. S. (2017). *The invisible ties of ownership*. Talk presented at the Society for Research in Child Development.
- Noles, N. S., Gelman, S. A., & Stilwell, S. (in press). Is it better to give than to receive? Children's biases in tracking and evaluating owned objects. *Journal of Cognition and Culture*.
- Norton, M. I., Mochon, D., & Ariely, D. (2012). The IKEA effect: When labor leads to love. *Journal of Consumer Psychology*, 22, 453-460.
- NPD Group. (n.d.). Average spend per child on toys worldwide in 2015, by country (in U.S. dollars). In *Statista - The Statistics Portal*. Retrieved June 29, 2018, from <https://www.statista.com/statistics/750787/global-toy-market-average-spend/>.
- Orvell, A., Kross, E., & Gelman, S. A. (2018). That's how "you" do it: Generic you expresses norms in early childhood. *Journal of Experimental Child Psychology*, 165, 183-195.
- Piaget, J. (1970). *Genetic epistemology*. New York, NY: Columbia University Press.
- Rakison, D. H., & Oakes, L. M. (Eds.). (2003). *Early category and concept development: Making sense of the blooming, buzzing confusion*. New York: Oxford University Press.
- Read, D., & Loewenstein, G. (1995). Diversification bias: Explaining the discrepancy in variety seeking between combined and separated choices. *Journal of Experimental Psychology: Applied*, 1(1), 34-49.
- Rhodes, M., & Gelman, S. A. (2009). A developmental examination of the conceptual structure of animal, artifact, and human social categories across two cultural contexts. *Cognitive Psychology*, 59(3), 244-274.
- Rhodes, M., & Mandalaywala, T. M. (2017). The development and developmental consequences of social essentialism. *Wiley Interdisciplinary Reviews: Cognitive Science*, 8(4).

- Roberts, S. O., Gelman, S. A., & Ho, A. K. (2017). So it is, so it shall be: Group regularities license children's prescriptive judgments. *Cognitive Science*, *41*, 576-600.
- Roe, L. S., Meengs, J. S., Birch, L. L., & Rolls, B. J. (2013). Serving a variety of vegetables and fruit as a snack increased intake in preschool children-. *The American Journal of Clinical Nutrition*, *98*(3), 693-699.
- Rossano, F., Rakoczy, H., & Tomasello, M. (2011). Young children's understanding of violations of property rights. *Cognition*, *121*(2), 219-227.
- Rottman, J., DeJesus, J. M., & Gerdin, E. (2018). The social origins of disgust. In N. Strohminger & V. Kumar (Eds.), *The moral psychology of disgust* (pp. 27-52). London: Rowman & Littlefield.
- Rottman, J., & Kelemen, D. (2012). Aliens behaving badly: Children's acquisition of novel purity-based morals. *Cognition*, *124*(3), 356-360.
- Rozin, P. (2005). The meaning of "natural" process more important than content. *Psychological Science*, *16*(8), 652-658.
- Sanner, M. A. (2001). Exchanging spare parts or becoming a new person? People's attitudes toward receiving and donating organs. *Social Science and Medicine*, *52*, 1491-1499.
- Schor, J. B., & Henderson, S. W. (2008). Understanding the child consumer. *Journal of the American Academy of Child & Adolescent Psychiatry*, *47*(5), 486-490.
- Scott, S. E., Inbar, Y., & Rozin, P. (2016). Evidence for absolute moral opposition to genetically modified food in the United States. *Perspectives on Psychological Science*, *11*(3), 315-324.
- Shaw, A., Li, V., & Olson, K. R. (2012). Children apply principles of physical ownership to ideas. *Cognitive Science*, *36*(8), 1383-1403.
- Shtulman, A., & Calabi, P. (2012). Cognitive constraints on the understanding and acceptance of evolution. In K. S. Rosengren, S. Brem, E. M. Evans, & G. Sinatra (Eds.), *Evolution Challenges: Integrating research and practice in teaching and learning about evolution*. Cambridge: Oxford University Press.
- Smyth, K., Feeney, A., Eidson, R. C., & Coley, J. D. (2017). Development of essentialist thinking about religion categories in Northern Ireland (and the United States). *Developmental Psychology*, *53*(3), 475-496.
- Snare F. (1972). The concept of property. *American Philosophical Quarterly*, *9*, 200-206.
- Snyder, C. R., & Fromkin, H. L. (1980). *Uniqueness: The human pursuit of difference*. New York, NY: Plenum.
- Sousa, P., Atran, S., & Medin, D. (2002). Essentialism and folkbiology: Evidence from Brazil. *Journal of Cognition and Culture*, *2*(3), 195-223.
- Stellar, J. E., & Willer, R. (2014). The corruption of value: Negative moral associations diminish the

- value of money. *Social Psychological and Personality Science*, 5, 60-66.
- Taborda-Osorio, H., & Cheries, E. W. (2018). Infants' agent individuation: It's what's on the insides that counts. *Cognition*, 175, 11-19.
- Tasimi, A., & Gelman, S. A. (2016, June). *Dirty money: The role of moral history in children's and adults' economic judgments*. Paper presented at 42nd Meeting of the Society for Philosophy and Psychology, Austin, TX.
- Tasimi, A., & Gelman, S. A. (2017). Dirty money: The role of moral history in economic judgments. *Cognitive science*, 41, 523-544.
- Taylor, M. G., Rhodes, M., & Gelman, S. A. (2009). Boys will be boys, cows will be cows: Children's essentialist reasoning about human gender and animal development. *Child Development*, 80(2), 461-481.
- Tomasello, M. (2009). *The cultural origins of human cognition*. Harvard University Press.
- Tsukamoto, S., Enright, J., & Karasawa, M. (2013). Psychological essentialism and nationalism as determinants of interethnic bias. *The Journal of Social Psychology*, 153(5), 515-519.
- Uhlmann, E. L., & Zhu, L. K. (2013). Money is essential: Ownership intuitions are linked to physical currency. *Cognition*, 127, 220-229.
- Ventura, A. K., & Mennella, J. A. (2011). Innate and learned preferences for sweet taste during childhood. *Current Opinion in Clinical Nutrition & Metabolic Care*, 14(4), 379-384.
- Verhallen, T. M., & Robben, H. S. (1994). Scarcity and preference: An experiment on unavailability and product evaluation. *Journal of Economic Psychology*, 15(2), 315-331.
- Waxman, S. R., & Gelman, S. A. (2009). Early word-learning entails reference, not merely associations. *Trends in Cognitive Sciences*, 13(6), 258-263.
- Waxman, S., Medin, D., & Ross, N. (2007). Folkbiological reasoning from a cross-cultural developmental perspective: Early essentialist notions are shaped by cultural beliefs. *Developmental Psychology*, 43(2), 294-308.
- Wilkins, J.S., 2013. Essentialism in biology. In K. Kampourakis (Ed.), *The philosophy of biology: A companion for educators* (pp. 395-419). Springer, Dordrecht.
- Winnicott, D. W. (1953). Transitional objects and transitional phenomena—A study of the first not-me possession. *International Journal of Psycho-Analysis*, 34, 89-97.
- Worchel, S., Lee, J., & Adewole, A. (1975). Effects of supply and demand on ratings of object value. *Journal of Personality and Social Psychology*, 32(5), 906-914.
- Yakomin, L. (2001). Baby's transitional object. <https://www.parents.com/baby/development/separation-anxiety/babys-transitional-object/>
- Zelizer, V. A. (1994). *The social meaning of money: Pin money, paychecks, poor relief, and other*

currencies. New York: Basic Books.

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