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The Effect of Realistic Contexts on Ontological Judgments of Novel Entities

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ABSTRACT

Although a great deal of research has focused on ontological judgments in preschoolers, very little has examined ontological judgments in older children. In the present study, 10-year-olds and adults (N = 94) were asked to judge the reality status of known real, known imagined, and novel entities presented in simple and elaborate contexts and to explain their judgments. Although judgments were generally apt, participants were more likely to endorse imagined and novel entities when the entities were presented in elaborate contexts. When asked to explain their reasoning, participants at both ages cited firsthand experience for real entities and general knowledge for imagined entities. For novel entities, participants referred most to indirect experiences when entities were presented in simple contexts and to general knowledge when those entities were presented in elaborate contexts. These results suggest that contextual information continues to be an important influence on ontological judgments past the preschool years.

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1. Introduction

Creating ontological categories, or determining what entities exist and how these entities should be grouped, is a fundamental challenge faced by young children. Following their creation, these categories must be continually updated and maintained throughout the lifespan. One key ontological assessment that must be made whenever one encounters a piece of new information is whether it is factual or not. In order to maintain a correct representation of the real world, it is important to make these reality status judgments accurately. Young children were once thought to have difficulty making such decisions correctly because they were thought to be wholly credulous (Dawkins, 1995; Piaget, 1930). However, a wealth of more recent work shows that even young children are critical consumers of novel information (Harris, 2007). Woolley and Ghossainy (2013) have even argued that children are "naïve skeptics," meaning their default ontological judgment is to deny the existence of unfamiliar entities.

It is well-established that even young preschoolers are largely adept at distinguishing reality from non-realities (Bourchier & Davis, 2002; Woolley & Wellman, 1993). The few errors they do reliably make are often in regards to entities with widespread cultural acceptance, like fantasy figures (Woolley, 1997). A considerable amount is also known concerning how young children make reality status judgments. Although they may privilege information gained through direct experience (Ma & Ganea, 2010; but see Jaswal, 2010), children must also accept information from others (Coady, 1992; Harris, 2012). For example, 4-8-year-olds claim that real, scientific, and endorsed entities (like cats, germs, and Santa Claus, respectively) do exist, but equivocal and impossible entities (like witches and flying pigs, respectively) do not (Harris, Pasquini, Duke, Asscher, & Pons, 2006). Children's willingness to endorse the existence of some non-observable entities shows they do use indirect sources, like testimony provided by other people. In addition, they consider this testimony critically: Children weigh a variety of factors when determining whether to endorse a piece of novel information, including whether there are multiple types of evidence (Woolley, Boerger, & Markman, 2004) or group consensus (Corriveau & Harris, 2010), the past reliability and expertise of the source (Jaswal & Neely, 2006; Koenig & Harris, 2005), and the certainty with which information is conveyed (Jaswal & Malone, 2007).

Children also consider the context of novel information when judging reality status. Woolley and Van Reet (2006) exposed 4-6-year-olds to novel entities embedded in either everyday (e.g., "Grandmothers find surnits in their gardens"), scientific (e.g., "Doctors use surnits to make medicine"), or fantastical (e.g., "Dragons hide surnits in their caves") descriptions, and found that children endorsed entities more frequently when those entities were presented in scientific contexts as compared to everyday or fantastical contexts. Similarly, 5-7-year-olds judged novel characters as real more often when the characters were presented in a historical story as compared to a fictional story (Corriveau, Kim, Schwalen, & Harris, 2009). These studies suggest that if unfamiliar information is surrounded by realistic or credible detail, children may be more likely to believe it.

Determining the ontological status of novel information is not a task unique to the preschool or early elementary years. Older children are constantly being asked to accept novel information in school that they cannot directly experience. This is especially true in disciplines like history and science that require children simply to accept novel facts like that George Washington actually lived and that the world is composed of particles. Older children are also more able and more likely to encounter information on their own, from media or from peers, without adults to scaffold their decisions about what is true and what is not. However, most research investigating reality status judgments has focused on children younger than 8, so it is unclear how older children make these judgments and whether they do so in a manner similar to younger children. Given older children's growing independence and their increasing reliance on indirect sources of information, it seems important to establish how this age group makes ontological decisions.

It may be that children are especially incredulous during middle childhood. Woolley and Ghossainy (2013) argue that children's limited metacognitive abilities might increase their skepticism because the children are unaware of how incomplete their own knowledge is. Children may judge a novel entity as unreal because they have never heard of it before, whereas adults recognize how much they themselves do not know. It may also be that as children become aware that not all sources of

information are credible, they may increase their "epistemic vigilance" (Mascaro & Sperber, 2009) and display more skepticism than adults (Mills & Keil, 2005). For example, when asked to judge whether extraordinary events could occur in real life, children frequently deny the possibility of events that adults judge improbable but not impossible (Cook & Sobel, 2011; Shtulman & Carey, 2007). Similarly, 8-10-year-olds prefer natural over supernatural explanations for unusual events, whereas adults prefer supernatural explanations (Woolley, Cornelius, & Lacy, 2011). Thus, older children may be more likely to deny the existence of novel entities, whereas adults may be more willing to consider the possibility that they exist.

However, it is also possible that determining reality status develops on a steadier path, on which older children's judgments are more accurate than those made by preschoolers and less accurate than those made by adults. Children's ability to remember the source(s) of their knowledge continues to develop throughout childhood and adolescence (Ackil & Zaragoza, 1995) and is negatively correlated with credulity and suggestibility (Thierry, Lamb, & Orbach, 2003). Children may evaluate novel information more capably as their source monitoring abilities improve.

In the present study, we investigated whether 10-year-olds and adults choose to endorse the existence of novel entities presented in realistic contexts. We used only realistic contexts for two reasons. First, previous research has shown that young children are generally skeptical of novel information, except when it is presented in a scientific context (Woolley & Van Reet, 2006); this study will determine whether older children and adults are similarly influenced. Second, a realistic context approximates how children encounter novel information in their everyday lives, at school or from peers.

A second goal of our study was to determine whether the amount of contextual information provided influences participants' ontological judgments. If the mere presence of a realistic context influences beliefs about controversial beings (i.e., imagined and novel entities), as is the case with preschoolers, we would expect participants to be equally likely to accept such entities when presented in simple, uninformative contexts and more elaborate, informative contexts. But given research showing that adults treat information with more detail as more credible (Bell & Loftus, 1988), it may be that participants will be more likely to accept equivocal entities when those entities are presented in an informative as compared to an uninformative context.

Lastly, to gain insight into how participants arrive at their ontological judgments, we asked them to explain their reasoning. Soliciting explanations is increasingly being recognized as a valuable way to learn about conceptual development, as explanations can offer more depth and precision than simple judgments alone (Wellman, 2011). Furthermore, in some instances children are more accurate when asked to explain than when they are asked other types of questions (Legare, Wellman, & Gelman, 2009). In the present research, we explore whether participants' explanations reveal what they consider to be the most important indicator(s) of reality status, whether these indicator(s) differ among real, imagined, and novel entities, and whether children and adults reason similarly.

2. Method

2.1. Participants

Forty-six 10-year-olds (24 females) and 48 undergraduates (26 females; age range 18 – 21 years) participated.[1] Children were recruited from a small city in the Mid-Atlantic U.S. and received a prize for their participation; undergraduates were recruited from a psychology department participant pool and received course credit for their participation. Most participants were Caucasian and middle-class, and all participants were native English speakers, reflecting the demographics of the area. An additional four children and 11 adults were tested but excluded due to procedural error or failure to complete the procedure.

[1] Descriptive statistics for age are unavailable because of an equipment failure. Although the exact mean and standard deviation of the sample are not known, it is known that only children between 10-0 and 11-0 were recruited.

2.2. Materials

Thirty target items were selected from three categories (10 per category): *real* entities, which exist and can be observed either directly or through veridical representation (e.g., monkey, house); *imagined* entities, which definitely do not exist (e.g., ghost, unicorn); and *novel* entities that do not exist but are unfamiliar, which could render their status equivocal (e.g., surnit, uba). For each category, half of the entities were natural kinds and half were artifacts (see Appendix).

Target names were printed in 72-point font on white cards (21.5 cm x 14 cm). Two definitions were created for each target. The definitions in the *simple description* condition followed the scientific condition of Woolley and Van Reet (2006). As such, they were realistic and consisted of three pieces of information presented in a set order: the target's name, a generic fact about the target, and a reference to a credible expert. In the *elaborate description* condition, the generic fact was replaced by two more detailed facts (see Appendix for sample definitions). This condition was designed to approximate information participants might encounter in their everyday lives (e.g., another person's testimony or a description on the Internet). To ensure that definitions varied in their complexity, an additional 19 undergraduates rated each definition on a six-point Likert scale (1 = not at all descriptive to 6 = extremely descriptive). Definitions in the elaborate description condition ($M = 4.52$, $SD = 0.73$) were rated as significantly more detailed than those in the simple description condition, $M = 2.22$, $SD = 1.04$; $t(18) = 7.40$, $p < .0005$.

2.3. Procedure

Participants were tested individually in a laboratory room. The experimenter explained that participants would hear about things that may or may not be familiar, and that it was their task to judge whether each thing is real or not. The 30 targets were presented in random order for each participant. The experimenter held up a card showing only the target's name and read the accompanying description aloud. The experimenter repeated the description upon request, then asked, "Are [target]s real or not real?" The options "real" and "not real" were counter-balanced. If participants did not know, they were encouraged to guess. Then were then asked, "How do you know that [target]s are (not) real?" This procedure was then repeated for the remaining target items. The complete procedure lasted approximately 30 minutes.

2.4. Coding

Participants' ontological status judgments were scored dichotomously (real = 1, not real = 0) during testing, and later summed to yield an overall existence score (ranging from 0 to 10) for each type of entity (real, imagined, novel). Explanations were classified into four mutually-exclusive categories, following Harris et al. (2006): *encounter* explanations referred to having (or not having) firsthand experience with the entity (e.g., "I ate eggs for breakfast" or "I have never seen one before"); *source* explanations referred to testimony (e.g., "My mom told me there's no such thing as ghosts") or veridical representations (e.g., "Monkeys are on TV all the time"); *generalization* explanations described traits, properties, or habits (e.g., "Because houses are made out of wood"); and *residual* explanations were uninformative (e.g., "Because there's no such thing"). Explanations were independently coded by two trained research assistants blind to the study's hypotheses. Inter-rater agreement was 80%; discrepancies were resolved by a third coder.

3. Results

3.1. Ontological Judgments

Results for the ontological judgments are shown in Figure 1. A 3 (entity type: real, imagined, novel) x 2 (condition: simple, elaborate) x 2 (age group: 10, adult) mixed analysis of variance (ANOVA) revealed a significant within-participants main effect of entity type, $F(2, 180) = 770.81$, $p < .0005$, $\eta_p^2 = .90$, on reality status judgments. Post hoc t-tests indicated that participants endorsed the existence

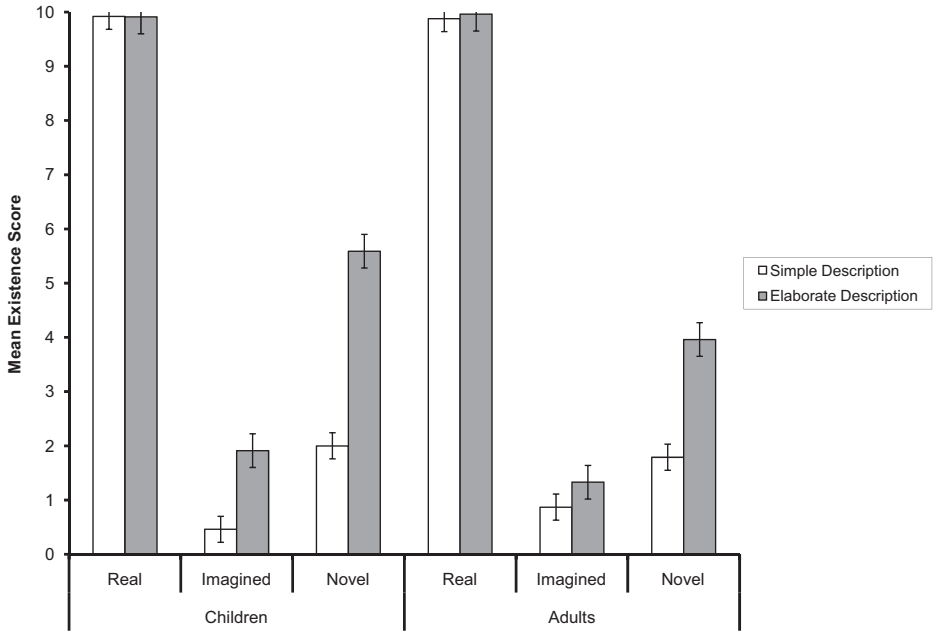

Figure 1. Mean existence scores (range = 0 to 10) as a function of age group, entity type, and condition. Bars represent standard errors.

of real entities more than novel entities, $t(180) = 21.33$, $p < .0005$, Cohen's $d = 3.11$, which were in turn endorsed more than imagined entities, $t(180) = 7.48$, $p < .0005$, Cohen's $d = 0.94$. Real entities were also endorsed more than imagined ones, $t(180) = 68.53$, $p < .0005$, Cohen's $d = 9.84$.

There was also a significant entity type x condition interaction, $F(2, 180) = 19.44$, $p < .0005$, $\eta_p^2 = .18$. As compared to participants in the simple description condition, participants in the elaborate description condition more frequently endorsed the existence of imagined entities, $t(180) = 4.00$, $p < .0005$, Cohen's $d = 0.82$, and novel entities, $t(180) = 5.19$, $p < .0005$, Cohen's $d = 1.07$. There was no significant entity type x age group interaction, nor was there a significant interaction among all the variables, suggesting that children and adults made similar judgments.

Collectively, these results suggest that 10-year-olds and adults are largely accurate in their ontological judgments of real and imagined entities and skeptical of novel entities, except when those entities are described with elaborate contexts. This effect suggests that individuals may be especially willing to believe information when it is presented in a detailed, realistic context.

3.2. Explanations of Judgments

The mean number of explanations of each type is shown in Table 1. Only 14.78% of children's explanations and 9.58% of adults' explanations fell into the residual category, so analyses focused on the three main explanation types. To determine how children reasoned about judgments for novel entities compared to known entities, whether context type influenced this reasoning, and if children reasoned similarly to adults, we compared how many of each type of explanation participants gave using three 3 (entity type: real, imagined, novel) x 2 (condition: simple, elaborate) x 2 (age group: 10, adult) mixed ANOVAs, one for each explanation type (encounter, source, and generalization).[2]

[2] To ensure that nothing was missed by analyzing each explanation type separately, we conducted 3 (explanation type) x 2 (age group) x 2 (condition) mixed-model ANOVAs comparing how many of each explanation type were given, one for

Table 1
Mean number of explanations (and standard deviations) as a function of age group, entity type, and condition. Note: range = 0 - 10.

		Encounter	Source	Generalization	Residual
Children	Simple description				
	Real	6.38 (2.08)	1.00 (1.14)	2.50 (1.91)	0.13 (0.34)
	Imagined	0.63 (0.88)	1.04 (1.40)	6.00 (2.86)	2.33 (2.22)
	Novel	0.42 (0.72)	3.62 (2.89)	3.79 (3.18)	2.38 (2.65)
	Elaborate description				
	Real	6.55 (2.15)	2.00 (1.27)	1.32 (1.91)	0.14 (0.47)
	Imagined	0.86 (1.25)	2.27 (1.39)	4.45 (2.87)	2.41 (2.26)
	Novel	0.45 (0.80)	2.64 (2.19)	5.45 (2.58)	1.45 (1.97)
Adults	Simple description				
	Real	7.21 (2.73)	0.37 (0.65)	2.21 (2.57)	0.21 (0.51)
	Imagined	1.33 (1.76)	1.29 (1.52)	5.83 (2.63)	1.54 (1.87)
	Novel	0.58 (0.93)	6.58 (2.86)	1.92 (2.47)	0.92 (1.53)
	Elaborate description				
	Real	7.29 (2.33)	0.67 (0.82)	1.71 (1.97)	0.71 (1.88)
	Imagined	0.83 (1.52)	1.71 (1.73)	5.62 (2.46)	1.83 (1.44)
	Novel	2.79 (3.08)	2.21 (3.08)	4.46 (2.83)	0.54 (1.29)

3.2.1. Encounter explanations

There was a main effect of entity type, $F(2, 180) = 391.36$, $p < .0005$, $\eta_p^2 = .81$, such that participants referred to direct experience (or lack thereof) more frequently when explaining their judgments of real entities than imagined entities, $t(180) = 23.74$, $p < .0005$, Cohen's $d = 3.09$, or novel entities, $t(180) = 21.16$, $p < .0005$, Cohen's $d = 2.68$. Encounter explanations for imagined and novel entities were rare and did not differ significantly. A significant entity type x condition interaction, $F(2, 180) = 3.74$, $p = .026$, $\eta_p^2 = .04$, revealed an exception to this general pattern: encounter explanations were given for novel entities significantly more frequently in the elaborate description condition, $t(180) = 3.02$, $p = .003$, Cohen's $d = 0.61$. This finding was driven by adults, as revealed by a significant entity type x condition x age group interaction, $F(2, 180) = 4.97$, $p = .008$, $\eta_p^2 = .05$. Adults provided more encounter explanations for novel entities in the elaborate description, $t(180) = 3.37$, $p = .002$, Cohen's $d = .97$, whereas children rarely provided encounter explanations in either condition. Practically speaking, this means adults more often chose to explain their "not real" judgments of novel entities by citing their lack of direct experience with the entities when descriptions were elaborate, perhaps because the increased detail allowed them to more confidently evaluate whether they had ever had experienced what was being described.

3.2.2. Source explanations

The number of times participants referred to indirect sources of information like other people, books, and television varied by entity type, $F(2, 180) = 57.30$, $p < .0005$, $\eta_p^2 = .39$. Source explanations were provided significantly more frequently for novel entities than for real ones, $t(180) = 7.50$, $p < .0005$, Cohen's $d = 1.15$, or for imagined ones, $t(180) = 6.26$, $p < .0005$, Cohen's $d = 0.88$, and for imagined entities than for real ones, $t(180) = 2.82$, $p = .006$, Cohen's $d = 0.42$. Thus, when direct experience was impossible because of an entity's novel status, participants relied on their indirect experience to make judgments (e.g., "It's not real because I've never heard about it before"; "It's real because I read about it in my history textbook").

However, the frequency of source explanations for each entity type varied by condition, as shown by a significant entity type x condition interaction, $F(2, 180) = 26.44$, $p < .0005$, $\eta_p^2 = .23$. In the elaborate

each entity type. As expected, these analyses showed a nearly identical pattern of results: Participants gave more encounter explanations than source or generalization ones for real entities, $F(2, 180) = 170.03$, $p < .0005$, $\eta_p^2 = .66$, and they gave more generalization explanations than encounter or source explanations for imagined entities, $F(2, 180) = 110.88$, $p < .0005$, $\eta_p^2 = .55$. For novel entities, frequency of each explanation type was affected by both age and condition as shown by a significant three-way interaction, $F(2, 180) = 5.76$, $p = .004$, $\eta_p^2 = .06$; both age groups tended toward generalization explanations in the elaborate condition and adults, but not children, preferred source explanations in the simple condition.

description condition, participants provided more source explanations for both real entities, $t(180) = 2.69$, $p = .009$, Cohen's $d = 0.55$, and imagined entities, $t(180) = 2.59$, $p = .011$, Cohen's $d = 0.53$. However, they provided more source explanations for novel entities in the simple description than in the elaborate description condition, $t(180) = 4.41$, $p < .0005$, Cohen's $d = 0.91$. It may be that the informative descriptions tended to remind participants of where they had encountered known entities before (e.g., "Flying carpets aren't real because they are only in cartoons"; "Monkeys are real because I learned about them in school"), but they turned to other explanations when the descriptions of the novel entities did not trigger any such memories.

3.2.3. Generalization explanations

The number of explanations referring to traits or properties varied by entity type, $F(2, 180) = 57.30$, $p < .0005$, $\eta_p^2 = .39$. Generalization explanations were provided significantly more frequently for imagined entities than for real ones, $t(180) = 10.68$, $p < .0005$, Cohen's $d = 1.45$, or novel ones, $t(180) = 4.47$, $p < .0005$, Cohen's $d = 0.57$, and for novel than for real entities, $t(180) = 5.17$, $p < .0005$, Cohen's $d = 0.73$. Participants were particularly likely to use information about why an entity was real or not real to justify their decisions about imagined entities (e.g., "Genies aren't real because a person can't fit into a lamp").

There was also a significant entity type x condition interaction, $F(2, 180) = 13.28$, $p < .0005$, $\eta_p^2 = .13$, such that participants in the elaborate description condition provided more generalization explanations for novel entities, $t(180) = 3.54$, $p = .001$, Cohen's $d = 0.73$, than did participants in the simple condition. This was likely because the extra facts in these longer descriptions provided participants with more chances to use their general knowledge (e.g., "Surnits can't be real because fish don't have teeth"). By contrast, there was no difference between conditions for imagined entities, $t(180) = 1.52$, $p = .131$, Cohen's $d = 0.32$, or real entities, $t(180) = 1.92$, $p = .057$, Cohen's $d = 0.41$, a pattern which held for both age groups.

3.2.4. Summary of Results

Taken together, these results suggest that both 10-year-olds and adults privilege firsthand experience when judging the reality status of real entities, but they rarely cite personal encounters (or lack thereof) for novel or imagined entities. References to indirect sources, like testimony, books, or media, were provided most often for novel entities, indicating that individuals recognize some information cannot be directly experienced. However, these explanations were given relatively infrequently overall, suggesting that both 10-year-olds and adults prefer to use their own firsthand or existing knowledge when possible. Lastly, references to general knowledge were particularly common for imagined entities. Context type also influenced how participants reasoned about their acceptance of entities, particularly novel entities. Elaborate descriptions were associated with an increase in the number of encounter explanations provided for novel entities, especially among adults. There was also an increase in the number of generalization explanations for novel entities given by both 10-year-olds and adults, but a decrease in the number of references to indirect experiences.

4. Discussion

Both 10-year-olds and adults usually judged the reality status of real, imagined, and novel entities appropriately. However, participants at both ages were influenced by the amount of realistic context provided for novel entities. Whereas participants largely denied the existence of novel entities when those entities were presented in simple contexts, participants' willingness to endorse such entities' existence significantly increased when the context was more elaborate. This effect was strong for all participants: adults' endorsement of novel entities nearly doubled and children's endorsement of imagined and novel entities approximately tripled when the context was elaborate. This finding is consistent with previous research demonstrating that context may be influential to belief formation and maintenance (Bruck & Ceci, 1999). Under some circumstances, namely when entities that are equivocal in status are supported by an elaborate context, it appears that older children and even adults may accept what they are told, even though this credulous acceptance could possibly lead to incorrect beliefs (Clément, 2010).

To our knowledge, the present study is one of the first to investigate the development of reality status judgments beyond the early childhood years. Studies of how young children determine reality status have made clear that young children are not unthinkingly credulous, but are influenced by a number of important cues. For example, young children are sometimes led astray by realistic context (Woolley & Van Reet, 2006). Considering how often older children and adults encounter novel information in realistic contexts, for example at school, through the media, or from peers, it was somewhat surprising that previous research had not investigated whether older children are affected by context in the same way younger children are. Here 10-year-olds endorsed fewer novel entities than the preschoolers in the comparable condition of Woolley and Van Reet (2006), but they endorsed more novel entities than were endorsed by adults. Thus, middle childhood does not appear to be a period of heightened skepticism, nor are 10-year-old children especially credulous. Rather, this pattern suggests that, when realistic context is one of the only cues available, the percentage of reality status judgments of novel information gradually increases with age; however, more research with intervening age groups is needed to confirm this hypothesis. It is interesting to consider what causes this increased accuracy. It is certainly possible that the ability or process of making reality status judgments does not change with age, and that, instead, what changes is the amount of knowledge or experience people have with which to make these determinations.

Our results make clear that both older children and adults are apt to endorse novel information when it is presented in an appropriately realistic context. In other words, a little bit of seemingly authentic information–true or not–appears to go a long way in influencing beliefs. Given children's and adults' increasingly easy access to trustworthy-sounding information, especially from online sources, our results have important implications for educating children to be competent media consumers (Buckingham, 2003). Children should perhaps be explicitly taught that elaborate description is not a reliable indicator of accuracy and should be weighted accordingly when evaluating the status of novel information. However, it is also important to note that our data cannot speak to the strength of participants' beliefs in the novel entities or whether they would act on those beliefs. Future work should include a measure of certainty or perhaps place participants in a more naturalistic situation in which they have to decide whether to use the novel information they just encountered.

Since we did not systematically vary the properties of the facts between the two conditions, it is not possible to conclude exactly why the facts in the elaborate description condition resulted in greater belief in equivocal entities. While the amount of information our participants heard did vary between conditions, it is arguable that the difference was relatively minor. Participants in the simple description condition heard three sentences, whereas participants in the elaborate condition heard four. Although possible, we believe length alone is not enough to explain why participants who heard the elaborate descriptions judged so many more novel entities as real.

The variation in content, notably differences in specificity and tone, likely played a meaningful role in participants' judgments. Participants in both conditions heard some of the same content, the entity's name, and a reference to a known expert (e.g., biologist). The low level of endorsement of the novel entities in the simple description condition suggests that association with an expert is not enough to make a novel entity sound real to either 10-year-olds or adults. The only element of the descriptions that differed between conditions was the facts created for the entities. In the elaborate description condition, these were purposefully more specific and used more sophisticated language because they were designed to mimic real-world expository text. Previous research has demonstrated that the perceived accuracy and credibility of information is directly influenced by its degree of detail (Bell & Loftus, 1988). Indeed, there are numerous real-world examples of how an intricate setting may foster beliefs in fantastical or novel entities: Elaborate marketing schemes (Higley & Weinstock, 2004) and widespread cultural reinforcement (Clark, 1995) promote belief in characters like the Blair Witch and Santa Claus. In our study, people may have been persuaded to believe in novel entities, despite a lack of firsthand or indirect evidence, simply because they were presented with more detail. However, future research is needed to disentangle the effects of length versus content. For example, would short, yet informative, descriptions foster more belief in novel entities than long, ambiguous ones?

Our results also reveal distinct patterns in how participants explained their judgments, providing insight into children and adults' ontological knowledge and reasoning (Wellman, 2011). Both children and adults privileged firsthand encounters as the source of their knowledge when it was available. This was especially true for real entities, which were selected to be highly familiar to both age groups. When direct experience was cited for imagined and novel entities, explanations tended to refer to a *lack* of personal experience (e.g., "Ubas are not real because I've never eaten one"). Overall, such occurrences were rare, indicating that both children and adults know that not having direct experience with an entity is not proof of its non-existence. However, adults did use this reasoning more frequently for novel entities described elaborately, possibly indicating that the extra detail made some adults more skeptical.

Interestingly, both 10-year-olds and adults appeared reluctant to cite a specific piece of knowledge (e.g., a direct or indirect experience) when judging imagined entities. Participants instead tended to rely upon their own general world knowledge (e.g., "Flying carpets aren't real because carpets don't have engines"). When direct experience is not possible, children and adults may privilege inferences based upon their preexisting category knowledge (Gelman, Star, & Flukes, 2002) over indirect sources of knowledge. If so, individuals with more limited general world knowledge, such as young children, may be especially credulous of such imagined entities. This is consistent with research showing that the rate of belief in fantastical beings is most pronounced in young children (Sharon & Woolley, 2004) and that persistent belief only occurs for beings that have societal-wide support (Clark, 1995).

When entities' equivocal status made any personal experience with them impossible, participants appeared to rely most upon indirect sources of knowledge, especially when the contextual information was uninformative. For example, for "not real" judgments, participants often referred to the fact that none of their usual trusted sources, like their parents, peers, teachers, or various media, had ever mentioned the entities. For the "real" judgments, they often referenced a specific instance, like a book or movie, as the source of their knowledge. This demonstrates that both 10-year-olds and adults can be sensitive to when they must rely upon indirect sources and are sometimes willing to consider the possibility that novel entities exist. This is consistent with previous research demonstrating that even young children have some understanding that lacking personal experience or extant knowledge of an entity does not mean that the entity does not exist (Harris et al., 2006). However, it must be noted that references to indirect experience decreased when elaborate descriptions were given in comparison to the simple descriptions. When participants were given more information, they chose to use their own knowledge or firsthand experience over information from indirect sources.

When presented with the unknown, one has the opportunity to learn something new. Determining the reality status of new information is a crucial step in this learning process. Our results suggest that neither 10-year-olds nor adults regard all sources of knowledge as equally trustworthy. Instead, there appears to be a hierarchy, in which direct experience is viewed as most reliable, then extant knowledge, and last, knowledge from indirect sources. In addition, different entity types prompted different explanations: Participants expected to have direct experience with real entities, no experience with imagined ones, and indirect experience with equivocal entities. And finally, this study demonstrates that older is not necessarily wiser: Individuals of all ages are vulnerable to being tricked into believing fictitious information if it is presented in a certain way.

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Appendix A.

A.1. Target entities with sample definitions

Real Entities
Test items. car, children, diamond, egg, house, lion, monkey, pigeon, president, rose
Simple Description. This card says monkey. Monkeys eat a lot of peanuts. Biologists study monkeys.
Elaborate Description. This card says monkey. Monkey is a term for lower-order simian primates. There are 264 known species of monkeys. Biologists study monkeys.
Imagined Entities
Test items. dragon's cave, elf, enchanted forest, fairy dust, flying carpet, genie, ghost, leprechaun, potion, unicorn
Simple Description. This card says ghost. Ghosts are sometimes see-through. Scientists research ghosts.
Elaborate Description. This card says ghost. Ghosts are apparitions of people who have recently died. Electromagnetic field detectors are used to find ghosts. Scientists research ghosts.
Novel Entities
Test items. citadist, dovat, hessalin, jorlicane, odonist, paravick, poleff, surnit, trag, uba
Simple Description. This card says surnit. Surnits run when they are scared. Scientists research surnits.
Elaborate Description. This card says surnit. Surnits are small fish that live at the bottom of the Great Lakes. Surnits have sharp teeth that they use to eat Zebra Mussels. Scientists research surnits.

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