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# When Allah meets Ganesha: Developing supernatural concepts in a religiously diverse society

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ABSTRACT

Belief in supernatural beings is widespread across cultures, but the properties of those beings vary from one culture to another. The supernatural beings that are part of Hinduism, for instance, are represented as human-like, whereas those that are part of Islam are represented more abstractly. Here, we explore how children exposed to both types of representations conceptualize the relevant beings. We administered several measures of anthropomorphism to Hindu and Muslim children ($n$ = 124) from a religiously-diverse community in India. Participants consistently anthropomorphized fictional beings (ghosts and fairies) and Hindu beings (Ganesha and Krishna) but varied in their anthropomorphization of Islamic beings (Muhammad, Allah). Younger participants (aged 8 to 11) anthropomorphized Islamic beings more than older participants (aged 12 to 15), and Hindu participants anthropomorphized them more than Muslim participants. These findings suggest that children initially anthropomorphize supernatural beings but can learn to conceptualize them more abstractly if encouraged by cultural input. They also suggest that abstract conceptions of divine agents are not a universal endpoint in the development of religious cognition.

## 1. Introduction

Belief in supernatural beings is widespread within and across cultures (Brown, 1991; Norenzayan, 2013). Representations of gods, spirits, and ancestors can be found in most human societies, but these representations vary widely. While supernatural beings are generally attributed minds, only some are attributed bodies (Heiphetz, Lane, Waytz, & Young, 2016; Shtulman & Lindeman, 2016). Such variation complicates learning about supernatural beings, as children cannot learn about such beings through direct observation and must instead rely on cultural input, like images and stories (Lane & Harris, 2014).

Here, we explore how children exposed to varied representations of supernatural beings—anthropomorphic, embodied representations, as well as abstract, body-less ones—come to conceptualize these beings. We interviewed children in Gujarat, India who are exposed to both the anthropomorphic deities of Hinduism and the abstract deities of Islam. Hindu children live next to Muslim families and are exposed to input about Islamic beings, and Muslim children live next to Hindu families and are exposed to input about Hindu beings. In contrast to children from religiously homogeneous cultures, Indian children are exposed to very different

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types of beings and must differentiate what is true about beings in their own religion from what is true about beings in other people's religions, not to mention beings that appear in fictional contexts but not religious contexts, like fairies and ghosts.

Psychologists interested in the development of supernatural-being concepts have focused either on the similarities between supernatural beings and human beings or on their differences. Those who focus on the differences explore children's understanding of properties unique to supernatural beings, such as immortality (Bering, 2006; Giménez-Dasí, Guerrero, & Harris, 2005) or omniscience (Barrett, Richert, & Driesenga, 2001; Lane, Wellman, & Evans, 2010; Makris & Pnevmatikos, 2007). US children typically learn of such properties as preschoolers, but they often fail to understand their full implications. For instance, four-year-olds in a study by Lane et al. (2010) agreed that "God knows everything," but they also claimed that God would think an unopened crayon box held crayons, even if it actually held marbles. By age five, US children typically stop attributing false beliefs to God but still fail to grasp the full implications of omniscience, claiming that omniscient beings know many things about many topics but not all things about all topics (Lane, Wellman, & Evans, 2014).

Other psychologists have studied the overlap between supernatural-being concepts and human-being concepts, on the assumption that the former are modeled on the latter (Richert, Shaman, Saide, & Lesage, 2016; Richert, Saide, Lesage, & Shaman, 2017; Sharon & Woolley, 2004; Shtulman & Lindeman, 2016; Shtulman & Rattner, 2018; Shtulman, 2008). In these studies, US children and adults are asked whether supernatural beings possess the psychological, biological, or physical properties true of humans. Although participants attribute many of these properties to fictional beings, like fairies and vampires, they vary in their attributions to religious beings, like angels and God. Children attribute more human properties to religious beings than adults do (Richert et al., 2016, 2017; Shtulman, 2008), and highly religious adults attribute more human properties to religious beings than less religious adults do (Shtulman & Lindeman, 2016). Attributions also vary by religion, with Hindus attributing more human properties than Christians (Shtulman & Lindeman, 2016), and Christians attributing more human properties than Muslims (Richert et al., 2016, 2017). Such differences are more pronounced for body-dependent properties, like eating or growing, than mind-dependent properties, like seeing or thinking, which implies that supernatural beings are regularly attributed minds but only sometimes attributed bodies.

The two lines of research described above converge on a similar developmental story. When learning about a new supernatural being, children assume the being possesses all the properties a human possesses, along with the special properties that make it supernatural. For fictional beings—beings that appear in myths or fairytales but not religious contexts—this assumption rarely needs to be revised over the course of development. Fairies are continuously represented as small humans with wings, and ghosts are continuously represented as deceased humans that can now pass through solid objects (Shtulman, 2008). These representations may be tweaked with additional input or reflection, but their core—*human being with supernatural properties*—remains largely unchanged.

For religious beings, on the other hand, children's initial representations may prove inadequate to capture the full range of ideas associated with those beings. The Judeo-Christian concept of God, for instance, is characterized by properties that oppose or negate the core properties of humans, including omniscience, omnipotence, omnipresence, and immortality. As children learn of such properties, they may adjust their initial, human-based representations of religious beings by stripping away more and more human-relevant properties, particularly body-dependent properties. This reconceptualization likely happens in tandem with a re-conceptualization of the being's uniquely supernatural properties. Children may initially conceptualize God as an invisible, undying human who knows many things—a kind of superhuman—but later come to conceptualize God as an infinite, omnipresent entity with the capacity to know anything and everything (Lane & Harris, 2014).

This account resonates with Boyer's (2001) influential model of supernatural-being concepts, according to which supernatural beings are represented as human beings with a handful of counterintuitive properties. It departs from this model, however, in that it assumes different developmental trajectories for religious beings and fictional beings. Fictional beings, like fairies, ghosts, vampires, and zombies, are represented as humans with counterintuitive properties across development, but religious beings, like gods, angels, demons, and spirits, are represented as such only by children. We use the terms "fictional" and "religious," rather than "believed in" and "not believed in," because the latter designations vary from person to person and, more importantly, because belief in a given being may matter less for its conceptualization than whether that being is part of a religious tradition. Atheists, for instance, still conceptualize God as less human-like than ghosts, and people who believe in ghosts still conceptualize them as more human-like than God (Shtulman, 2008).

One framework commonly used in analysis of beliefs about religious entities is *anthropomorphism.* While this term can be used in various ways, in the present work we use the term to refer to cases in which the mental or public representation of a supernatural entity contains prominent features that are also true of humans. This use of the term allows for gradations of anthropomorphism. A being could be attributed many human properties or just a few, and it could be attributed mostly human properties or a mixture of human and non-human properties.

As an illustration, consider differences between the Hindu beings Ganesha and Krishna and the Islamic beings Allah and Muhammad. Ganesha, the Hindu god of wisdom and new beginnings, has the distinctive property of an elephant's head, and Krishna, the Hindu god of love and compassion, has the distinctive property of blue skin. Elephant heads and blue skin are not human properties, but they coexist with many properties that are. Both Ganesha and Krishna are represented as having human arms and legs. They carry human artifacts (an axe for Ganesha, a flute for Krishna). They perform human activities, like eating, dancing, and sleeping. And they engage in direct, physical interactions with humans and other gods. Allah and Muhammad, on the other hand, are almost never depicted in images, and their depictions in text include many properties that humans do not, and could not, possess. Allah is described as omnipotent, omniscient, and omnipresent, and Muhammad is described as splitting the moon, conjuring objects out of thin air, and casting no shadow (Woodward, 2001). While Allah and Muhammad are regularly attributed the properties of a human mind—thought, intention, language—they are less regularly attributed the properties of a human body, particularly Allah. Of course, it's an empirical question how differences in the public representation of religious beings influence our mental representations

of those beings.

The developmental research reviewed above supports an anthropomorphic-to-abstract shift in the conceptualization of religious beings, but a major limitation of those findings is that they come from mainly Judeo-Christian samples in the US. While there has been extensive cross-cultural work on such religious phenomena as rituals (Xygalatas et al., 2013), afterlife beliefs (Watson-Jones, Busch, Harris, & Legare, 2017), and the prosocial consequences of religious belief (Purzycki et al., 2016), there has been little work on the anthropomorphic underpinnings of supernatural-being concepts outside of a Judeo-Christian context, where religious beings are typically represented in speech and images as abstract entities. In the present study, we explore the development of supernatural-being concepts in a context where religious beings are represented much more anthropomorphically: India. Hinduism is the most common religion in India, practiced by around 75% of the population, and it embraces anthropomorphism as a means of understanding the divine (Eck, 1998). Hindu gods are frequently depicted as having physical bodies, and these depictions may lead children to maintain anthropomorphic conceptions across development.

No studies, to our knowledge, have explored the development of god concepts in Hindu children, though some studies have explored the god concepts of Hindu adults. Shtulman and Lindeman (2016) asked Hindu adults, recruited from India through Amazon's Mechanical Turk, whether God possesses the psychological, biological, or physical properties of humans—with God defined as "the god that is most personally important to you," given that there are hundreds of Hindu gods. The Hindu adults attributed significantly more biological and physical properties to God than Christian adults did, but both groups attributed approximately the same number of psychological properties. That said, Hindu adults, like Christian adults, took longer (in terms of response time) to attribute biological and physical properties to God than to attribute psychological properties, and they were less confident and less consistent in those attributions.

Other studies with Hindu adults are inconclusive with respect to the question of how much they anthropomorphize Hindu gods. Fincham, May, and Kamble (2019) asked Hindu adults to list properties associated with Hindu gods and found that the most commonly listed properties were abstractions like "love," "truth," and "safety." Barrett (1998) asked Hindu adults about the supernatural properties of Hindu gods and found high levels of endorsement. These properties were distinctly non-anthropomorphic, such as "Vishnu can pass through solid objects," "Vishnu knows everything," and "Vishnu can do any number of things at the same time." Nevertheless, when participants were asked to remember and recount stories about Hindu gods, they frequently inserted anthropomorphic ideas that were not present in the original story. For example, when recounting a story in which Vishnu performed several actions at once, many recalled Vishnu performing the actions one at a time.

As a whole, these findings indicate that Hindu adults hold nuanced conceptions of Hindu gods that include both anthropomorphic properties and non-anthropomorphic properties. It is unclear, however, whether these conceptions are more or less anthropomorphic than Hindus' conceptions of other supernatural beings. It's also unclear whether Hindus' conceptions of Hindu gods are more or less anthropomorphic than others' conceptions of the same gods—i.e., conceptions of those who are regularly exposed to public representations of Hindu gods but who do not believe they exist.

In this vein, India serves as an ideal context for exploring cultural constraints on the development of supernatural-being concepts. Not only is the predominant religion non-Abrahamic but this religion coexists with the Abrahamic religion of Islam. Islam is practiced by around 14% of the population, and the Muslim population in India constitutes around 10% of the Muslim population worldwide. Islam differs from Hinduism more than it differs from Judaism or Christianity (the other Abrahamic religions). Islam and Hinduism encompass different rituals, different norms, different celebrations, and—most important for our purposes—different supernatural beings. Islamic beings and Hindu beings not only differ in their properties but also in how those beings are depicted in public representations, like text, images, and statues. Whereas iconography and anthropomorphism are encouraged in Hinduism, they are actively prohibited in Islam (Holtzman, 2018). Thus, in India, the distribution of anthropomorphic to abstract representations of religious beings differs by religious community within the same geographical community, raising questions of how exposure to diverse public representations of supernatural beings shapes people's mental representations of those beings. Representations of Hindu beings may outnumber representations of Islamic beings within India, but the close proximity of these representations affords an opportunity for examining the conceptual influences of one cultural tradition on those who practice a very different tradition.

Here, we explored how exposure to representations of supernatural beings affects children's developing mental representations of those beings by asking how strongly Indian children anthropomorphize the supernatural beings depicted in their community. We asked participants whether the beings possess a range of human properties—some psychological, some biological, some physical—as well as whether the beings can be perceived, whether they can be found in the real world, and what the beings are like. For each measure, we assessed how often participants treated the beings like a human being—i.e., how often they described the being with human properties, how often they claimed the being could be perceived, how often they claimed the being could be found. We did not expect participants to treat any of the supernatural beings equivalently to humans, but we expected them to treat Hindu beings more like humans than they treated Islamic beings on the same measures. That is, we expected children to attribute more human properties to Hindu beings than to Islamic beings, to describe Hindu beings in more anthropomorphic terms, to claim that Hindu beings are more likely to be seen, heard, and touched, and to claim that Hindu beings are more likely to be found in the real world.

We recruited both Hindu and Muslim participants to assess how beings within one's own religion are conceptualized relative to those from the others' religion. We expected children to anthropomorphize Hindu beings more than Islamic beings in general, but it was an open question whether these conceptions would be moderated by children's religious affiliation. One possibility was that representational practices in children's own religion would color their interpretation of the beings in other religions, such that Hindu children would treat Islamic beings more anthropomorphically than Muslim children (since Hinduism embraces anthropomorphism) and Muslim children would treat Hindu beings more abstractly than Hindu children (since Islam prohibits anthropomorphism). Another possibility was that all children would anthropomorphize Hindu beings, owing to positive evidence of their human-like

qualities in images and stories, but Hindu children would anthropomorphize Islamic beings more than Muslim children, owing to Muslim children's greater exposure to prohibitions against anthropomorphizing Islamic beings.

We also sought to determine whether findings from previous research on children's supernatural-being concepts, conducted within a Western context, would replicate in a non-Western context—namely, the findings that religious beings are anthropomorphized more than fictional beings, that religious beings are anthropomorphized more by younger children than by older children, and that religious beings are attributed more psychological properties than biological or physical properties. These findings, if replicated in a non-Western context, would further confirm that children initially represent supernatural beings of all kinds as human-like but, with age, come to differentiate religious beings from fictional beings, and mind-dependent properties from body-dependent properties.

## 2. Method

### 2.1. Participants

Our participants were 124 children recruited from an English-language school in Vadodara, in Gujarat Province, India. Parents of participants gave informed written consent prior to their child's participation, and each child gave written assent before starting the interview. Sixty-one children were recruited from the fourth and fifth grade classrooms (age range = 8.5 to 11.7, *M* age = 9.9), and 63 were recruited from the eighth and ninth grade classrooms (age range = 12.4 to 15.3, *M* age = 13.7). These classrooms were selected based on an existing relationship with members of the research team. We refer to fourth and fifth graders as the "younger group" and to eighth and ninth graders as the "older group."

Around half of the participants were Hindu (48%) and half were Muslim (52%). Hindus are the majority group in Vadodara, but the school makes an effort to enroll equal numbers of Hindu and Muslim students. Of the 114 participants who reported their gender, 49% were male and 51% were female. Three additional participants were tested but dropped from the final analysis for providing atypical responses to the control items, discussed below.

### 2.2. Procedure

Participants answered questions about six supernatural beings: Allah (the Islamic creator god), Muhammad (an Islamic prophet), Ganesha (the Hindu god of wisdom and new beginnings), Krishna (the Hindu god of love and compassion), bhoot (ghost), and pari (fairy). Allah and Muhammad were selected as exemplars of Islamic beings; Ganesha and Krishna as Hindu beings; and bhoots and paris as fictional beings. Participants also answered questions about a human being (a doctor) as an attention check, to ensure that children would extend human properties to a real human. All questions were posed in English, but a translator was available if needed.

We selected Muhammad as one of our two Islamic beings because Muhammad, like Allah, is represented in text but not images. Muhammad is also believed to have performed many miracles, including conjuring food, conjuring rain, speaking to the dead, healing the sick, and curing the blind (Woodward, 2001). For these reasons, we thought it was unlikely children would view Muhammad as a normal human being, even if they viewed him as more human-like than Allah. We also thought that Muslim children might view him as less human-like than Hindu children, particularly older Muslim children who were more familiar with his supernatural feats.

Participants answered 23 questions for each being. Twelve were of the form "Does [being] [property]?", as in "Does Allah dream?" or "Does Ganesha sneeze?" Four of the properties were psychological (dream, think, forget, make a mistake); four were biological (eat, grow, cough, sneeze); and four were physical (jump, sit, fall, get tired). Half of the properties described human abilities (dream, think, eat, grow, jump, sit), and half described human limitations (forget, make a mistake, cough, sneeze, fall, get tired). Participants also indicated: (1) how much they know about each being, (2) what the being is like (in their own words), (3) how strongly they believe in each being, (4) whether the being is part of Hinduism or Islam, (5) whether most Hindus or Muslims believe in the being, (6) whether the being can be seen, heard, or touched, (7) whether the being can be found, and if so where (in their own words). Questions for each being were always presented in this order, but the beings were presented in one of four pseudorandom orders.

By including several measures of conceptualization, we sought to assess the overlap between how participants reason about supernatural beings and how they reason about human beings. No single measure or set of measures was treated as indicative of anthropomorphism. Rather, participants' overall pattern of responses was used to gauge the degree to which they might import expectations about human beings to make sense of supernatural beings (see Shtulman & Rattner, 2018, for a similar approach with adults). We expected participants to vary in this regard, with some applying many human-relevant expectations to religious beings and others applying few, but we do not address the question of how participants who import few human-relevant expectations conceptualize the beings. We describe such conceptions as "abstract" in the current paper and hope that future research will determine the nature of that abstraction, as well as whether some abstractions (e.g., "Allah is love") are more common or more intuitive than others (e.g., "Allah is light").

We included the item "doctor" as an attention check; a failure to attribute human properties to a doctor would challenge our ability to interpret a similar failure with other items. Three participants attributed fewer than four human properties to doctors and were dropped from the dataset. The remaining participants ($n$ = 124) attributed an average of 10.4 properties to doctors (87% of all properties), and all participants attributed at least one psychological property, one biological property, and one physical property. The three participants who were dropped also did not meet this latter criterion.

Additional questions were included to ensure that participants interpreted the beings as intended. For each being, participants indicated whether it is "part of only Hinduism, only Islam, both Hinduism and Islam, or neither Hinduism or Islam." As expected, participants classified the Hindu beings as part of Hinduism 95% of the time (91% only Hinduism, 4% both Hinduism and Islam) and classified the Islamic beings as part of Islam 95% of the time (83% only Islam, 12% both Hinduism and Islam). Fictional beings, on the other hand, were predominantly classified as part of neither religion (53%) or as part of both (37%). Some participants appear to have conflated the supernatural status of ghosts and fairies with religious status, but few associated these beings with a specific religion, as they did for the other beings.

Participants were also asked to assess whether most Hindus believe in each being and whether most Muslims believe in each being. Ninety-eight percent agreed that most Hindus believe in the Hindu beings, and 95% agreed that most Muslims believe in the Islamic beings. Conversely, only 13% of participants agreed that most Hindus believe in the Islamic beings, and only 18% agreed that most Muslims believe in the Hindu beings. The fictional beings were judged as much less believable; 50% of participants agreed that most Hindus believe in the fictional beings and 35% agreed that most Muslims believe in them. While at first glance this might suggest an overestimate of how many Hindus and Muslims believe in bhoots (ghosts) and paris (fairies), Gallup polls of American adults find that three in four believe in some form of nonreligious supernatural entity and a full third believe in ghosts (Moore, 2005). More relevant for our purposes, ratings for the fictional beings were not as asymmetric (in terms of which religious group believed in them) as they were for the religious beings.

In sum, these data indicate that participants not only associated the right beings with the right religions but were also aware of differences in the believability of those beings for members of each religion. While participants did associate fictional beings with religion more than expected, our focus is on the religious beings and whether children view beings from their own religion differently than their peers view those beings.

Participants' belief attributions are consistent with previous findings from the same school on Hindu and Muslim children's understanding of religious norms (Srinivasan, Kaplan, & Dahl, 2018). In that study, Hindu and Muslim children exhibited awareness of both Hindu norms (e.g., the dead should be cremated) and Muslim norms (e.g., the dead should be buried), and differentiated between norms that apply only to their group, norms that apply to the other group, and norms that apply to everyone (e.g., that one should not physically harm someone else). Children's perception of the sociological differences between religious groups appears to extend to concepts of religious beings as well.

## 3. Results

### 3.1. Overview

Participants provided six types of responses: knowledge ratings, belief ratings, open-ended descriptions, perceptibility judgments, locatibility judgments, and property attributions. We analyze these responses in two stages. First, we assess how responses differed by being (pari vs. bhoot vs. Ganesha vs. Krishna vs. Muhammad vs. Allah), by participants' age (younger vs. older), and by participants' religion (Hindu vs. Muslim) with a 6 × 2 x 2 repeated-measures analyses of variance (ANOVA). The effect of being was analyzed within participants, and the effects of age and religion were analyzed between participants. Mean responses are displayed by age and religion in Figs. 1–6, and effect sizes are displayed in Table 1.

For all measures, the ANOVAs revealed interactions between the beings under consideration and participants' age or religion. To explore the interactions, we ran a second set of ANOVAs assessing the effects of age and religion for each being on its own. Effect sizes for these analyses are displayed in Table 2. Similar analyses were used to explore participants' property attributions, which varied not only by being but also by domain (psychology vs. biology vs. physics) and by valence (ability vs. limitation). Means for domain analyses and valence analyses are displayed in Figs. 7 and 8 (respectively), and effects sizes are displayed in Tables 3 and 4 (respectively).

### 3.2. Knowledge ratings

Participants rated how much they know about each being on a three-point scale: nothing, a little, or a lot. "Nothing" was assigned a value of 0; "a little," 1; and "a lot," 2. We asked these questions to verify that participants know more about beings from their own religion than beings from the other religion, as well as to determine whether such differences increase with age.

Mean knowledge ratings are displayed in Fig. 1. These ratings varied by being ($F(5,600) = 5.35$, $p < .01$, $\eta_p^2 = .04$) but not by participants' age or religion (see Table 1). The effect of being was qualified by an interaction with religion ($F(5,600) = 77.02$, $p < .001$, $\eta_p^2 = .39$). Follow-up ANOVAs for each being revealed that Hindu participants reported knowing more about the Hindu beings Ganesha ($F(1,120) = 66.59$, $p < .001$, $\eta_p^2 = .36$) and Krishna ($F(1,120) = 72.35$, $p < .001$, $\eta_p^2 = .38$), while Muslim participants reported knowing more about the Islamic beings Muhammad ($F(1,120) = 118.27$, $p < .001$, $\eta_p^2 = .50$) and Allah ($F(1,120) = 61.08$, $p < .001$, $\eta_p^2 = .34$; see Table 2). Hindu participants also reported knowing more about paris ($F(1,120) = 11.94$, $p < .01$, $\eta_p^2 = .09$), but the difference was small compared to the differences for Ganesha and Krishna.

### 3.3. Belief ratings

Participants rated how much they believe in each being from "not at all" (0) to "a little" (1) to "a lot" (2). As with the knowledge ratings, we collected belief ratings to verify that participants believed in beings from their own religion more strongly than they

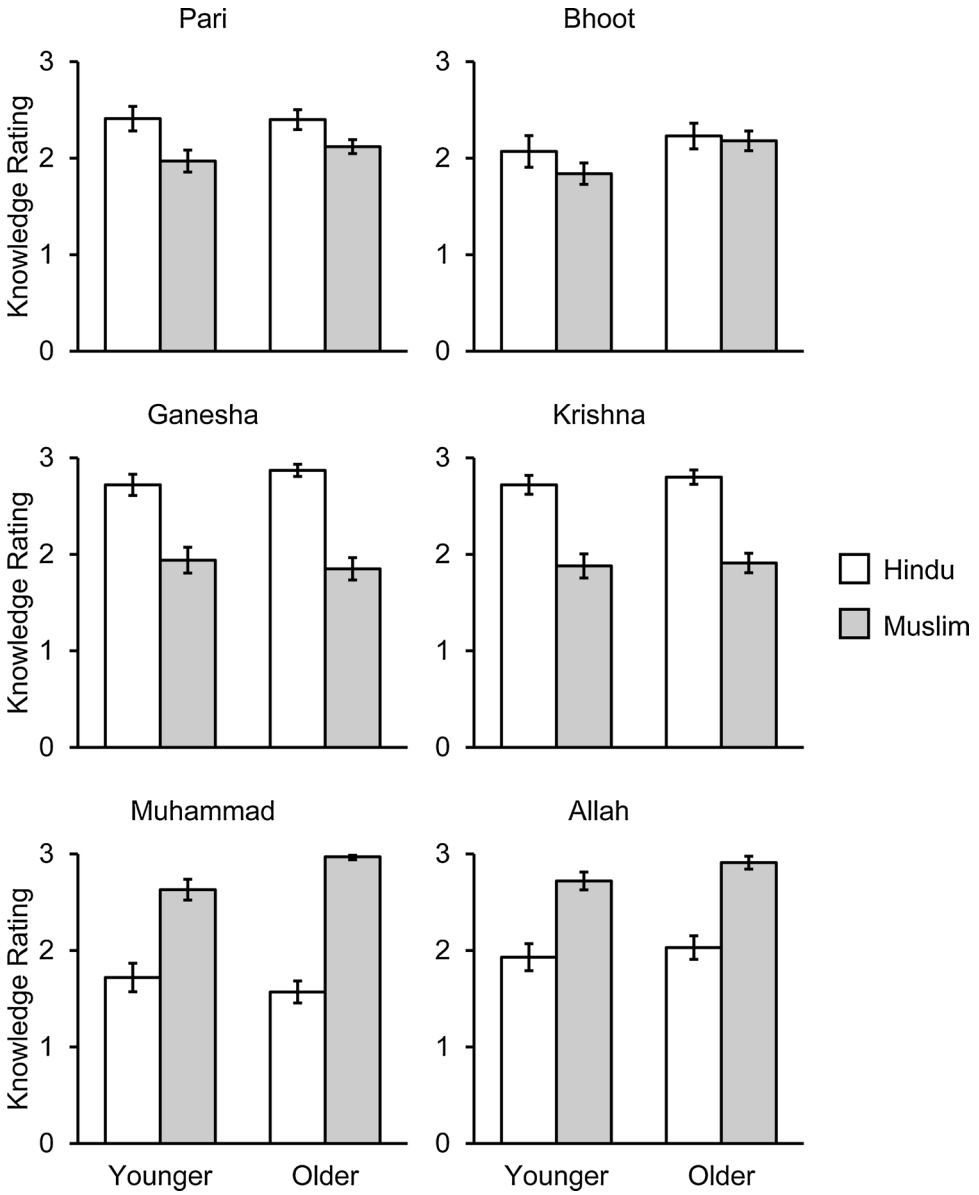


**Fig. 1.** Mean knowledge ratings for each being (out of 3), analyzed by participants' age and religion. Error bars represent *SE*.

believed in beings from the other religion, and to determine whether such differences increase with age.

Mean belief ratings are displayed in Fig. 2. As with knowledge ratings, belief ratings varied by being ($F(5,600) = 45.38$, $p < .001$, $\eta_p^2 = .27$) but not by participants' age or religion (see Table 1). The effect of being was qualified by an interaction with religion ($F(5,600) = 90.46$, $p < .001$, $\eta_p^2 = .43$), as well as a three-way interaction with religion and age ($F(5,600) = 3.60$, $p < .001$, $\eta_p^2 = .03$). Follow-up ANOVAs for each being revealed that Hindu participants reported stronger belief in Ganesha ($F(1,120) = 38.80$, $p < .001$, $\eta_p^2 = .43$) and Krishna ($F(1,120) = 80.15$, $p < .001$, $\eta_p^2 = .40$), and Muslim participants reported stronger belief in Muhammad ($F(1,120) = 92.54$, $p < .001$, $\eta_p^2 = .44$) and Allah ($F(1,120) = 113.92$, $p < .001$, $\eta_p^2 = .49$; see Table 2). An interaction between religion and age was observed for Muhammad ($F(1,120) = 8.47$, $p < .01$, $\eta_p^2 = .07$) because belief ratings increased with age for Muslim participants but decreased with age for Hindu participants. The only other significant effect was that younger participants reported stronger belief in paris ($F(1,120) = 4.32$, $p < .05$, $\eta_p^2 = .04$), regardless of religion.

### 3.4. Open-ended descriptions

Participants were asked to describe each being in their own words, and these descriptions were coded in a two-stage process, following Shtulman (2008). Descriptions were broken into separate predicates, and predicates were coded as to whether they apply to

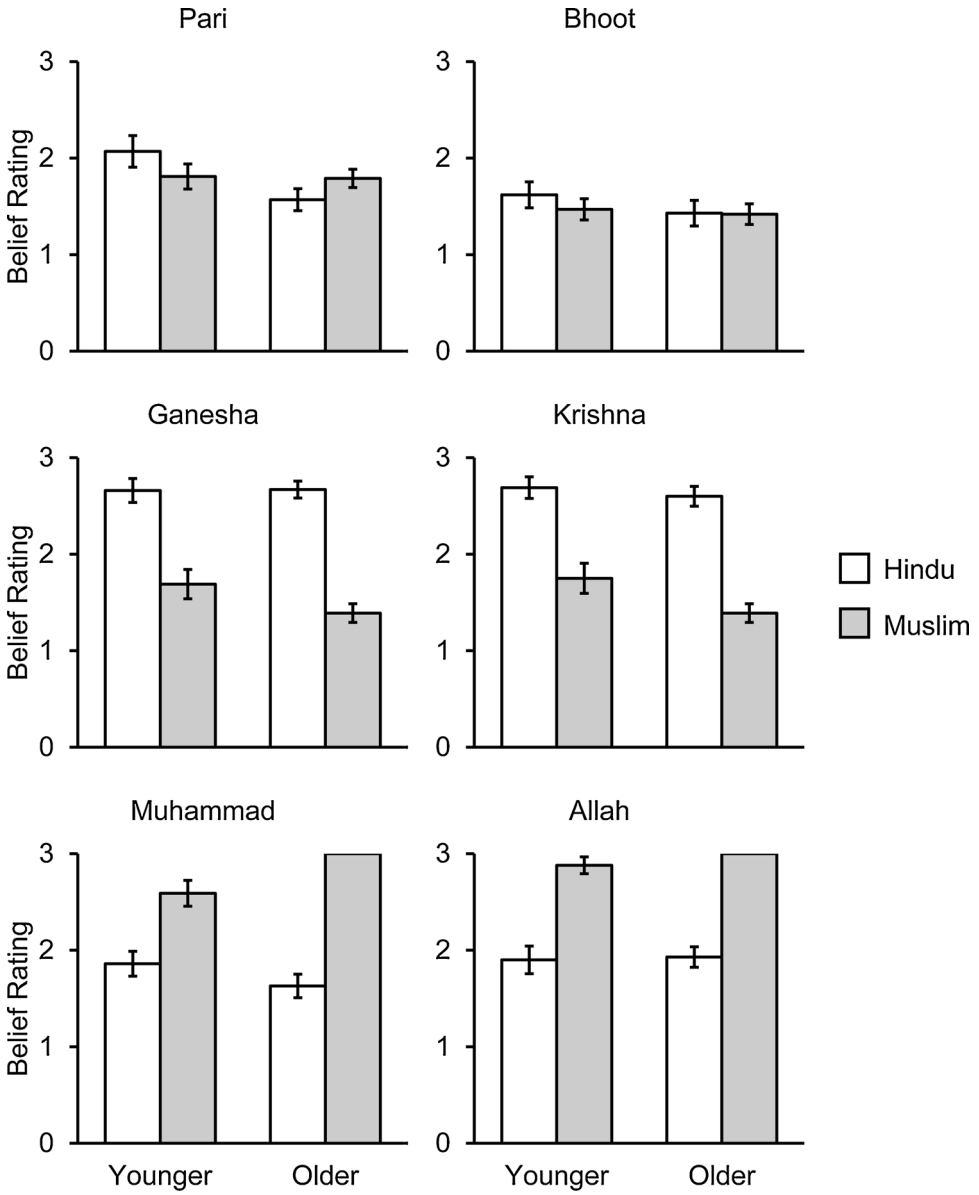


**Fig. 2.** Mean belief ratings for each being (out of 3), analyzed by participants' age and religion. Error bars represent *SE*.

humans. For instance, the description "Allah is very helpful. He is a good man. He knows everything about the future" was broken into the predicates "is very helpful," "is a good man," and "knows everything about the future." The first two predicates were coded as applicable to humans, whereas the last was coded as not applicable. Descriptions that pertained to the participants rather than the beings, such as "I love Allah" or "I don't know anything about Muhammad," were excluded from analysis. As a result, 87% of participants provided codable descriptions of bhoots; 88%, paris; 91%, Ganesha; 90%, Krishna; 63%, Muhammad; and 88%, Allah.

Because participants varied in how many predicates they provided (ranging from 1 to 7 for any given being), we calculated a relative measure of anthropomorphism by dividing the number of human-relevant predicates by the total number of predicates. On this measure, the above description received a score of 0.67. One coder applied this coding scheme to all descriptions, and a second coder applied the scheme to a subset of descriptions (17%). Agreement on whether individual predicates were relevant to humans was 72% (Cohen's kappa = 0.46, a moderate value), and the Pearson's correlation among final scores was 0.73. Our reliability was adequate but lower than desired because participants' responses proved difficult to decipher. Participants made their responses in English, but English was not their native language.

The mean proportion of human-relevant predicates to total predicates is displayed by being in Fig. 3. These proportions varied by being ($F(5,600) = 14.77$, $p < .001$, $\eta_p^2 = .23$), by participants' religion ($F(1,120) = 10.29$, $p < .01$, $\eta_p^2 = .17$), and by the interaction of being and religion ($F(5,600) = 2.34$, $p < .05$, $\eta_p^2 = .05$; see Table 1). Bonferroni comparisons revealed that the main

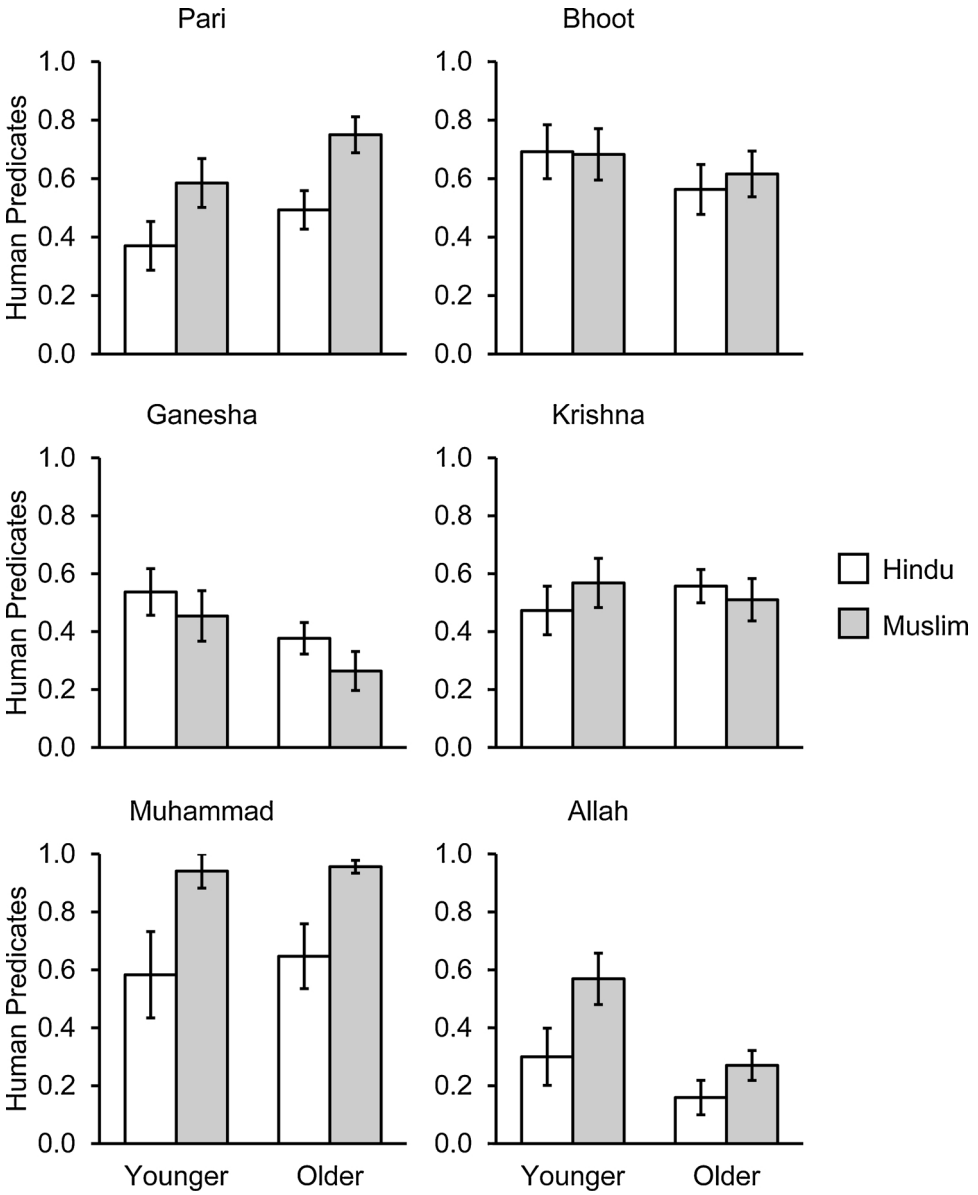


**Fig. 3.** Mean proportion of human-relevant predicates to total predicates in descriptions of each being, analyzed by participants' age and religion. Error bars represent *SE*.

effect of being was driven by the Islamic beings. Allah was described with fewer human-relevant predicates than any other being, and Muhammad was described with more such predicates than Ganesha or Krishna. Follow-up ANOVAs for each being revealed that Muslim participants used more human-relevant predicates when describing paris ($F(1,120) = 10.09$, $p < .01$, $\eta_p^2 = .09$), Muhammad ($F(1,120) = 18.37$, $p < .001$, $\eta_p^2 = .20$) and Allah ($F(1,120) = 6.47$, $p < .05$, $\eta_p^2 = .06$) and that younger participants used more human-relevant predicates when describing Ganesha ($F(1,120) = 5.78$, $p < .05$, $\eta_p^2 = .05$) and Allah ($F(1,120) = 8.71$, $p < .01$, $\eta_p^2 = .08$; see Table 2).

The finding that Muhammad and Allah were described more anthropomorphically by Muslim participants than by Hindu participants was unexpected but explainable by the fact that Hindu participants provided sparser descriptions. Hindu participants' descriptions of Muhammad contained an average of 1.3 predicates, compared to 2.1 for Muslim participants ($t(79) = 2.91$, $p < .01$), and Hindu participants' descriptions of Allah contained an average of 1.7 predicates, compared to 2.4 for Muslim participants ($t(110) = 3.01$, $p < .01$). The most common predicate in Hindu participants' descriptions was "is a god," which is not applicable to humans. Muslim participants, on the other hand, used predicates like "is good," "is generous," and "helps people," which are applicable to humans. It's possible that such differences would disappear with further questioning of the Hindu participants, but it's also possible that Hindu participants simply knew less about the Islamic beings—a possibility we revisit in the Discussion.

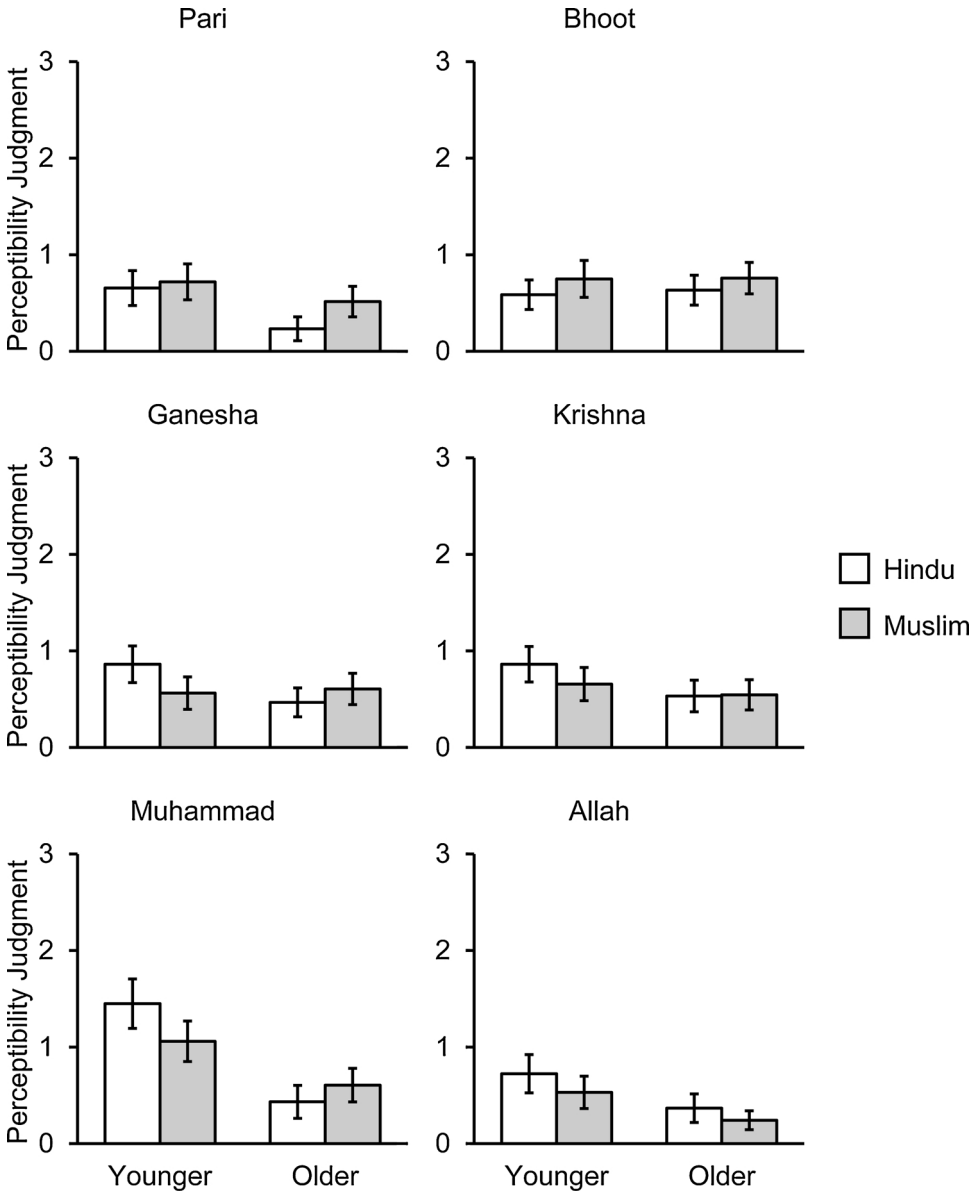


**Fig. 4.** Mean perceptibility judgments for each being (out of 3), analyzed by participants' age and religion. Error bars represent *SE*.

### 3.5. Perceptibility judgments

Participants were asked whether each being could be seen, heard, or touched. These questions were intended to assess beliefs about the beings' physicality, or their bodily instantiation in the physical world. We combined participants' answers into composite scores ranging from 0 to 3, displayed in Fig. 4. These scores varied by being ($F(5,600) = 4.91$, $p < .001$, $\eta_p^2 = .04$), by participants' age ($F(1,120) = 5.51$, $p < .05$, $\eta_p^2 = .04$), and by the interaction of being and age ($F(5,600) = 3.71$, $p < .01$, $\eta_p^2 = .03$; see Table 1).

Bonferroni comparisons revealed that the main effect of being was driven by the difference between Muhammad and Allah, with Muhammad judged significantly more perceptible than Allah. These findings are consistent with the description data presented above. Allah, who was described least anthropomorphically, was judged least perceptible, and Muhammad, who was described most anthropomorphically, was judged most perceptible. Follow-up ANOVAs revealed that perceptibility judgments decreased with age for Muhammad ($F(1,120) = 13.02$, $p < .001$, $\eta_p^2 = .10$) and for Allah ($F(1,120) = 4.36$, $p < .05$, $\eta_p^2 = .04$) but not for any other being (see Table 2).

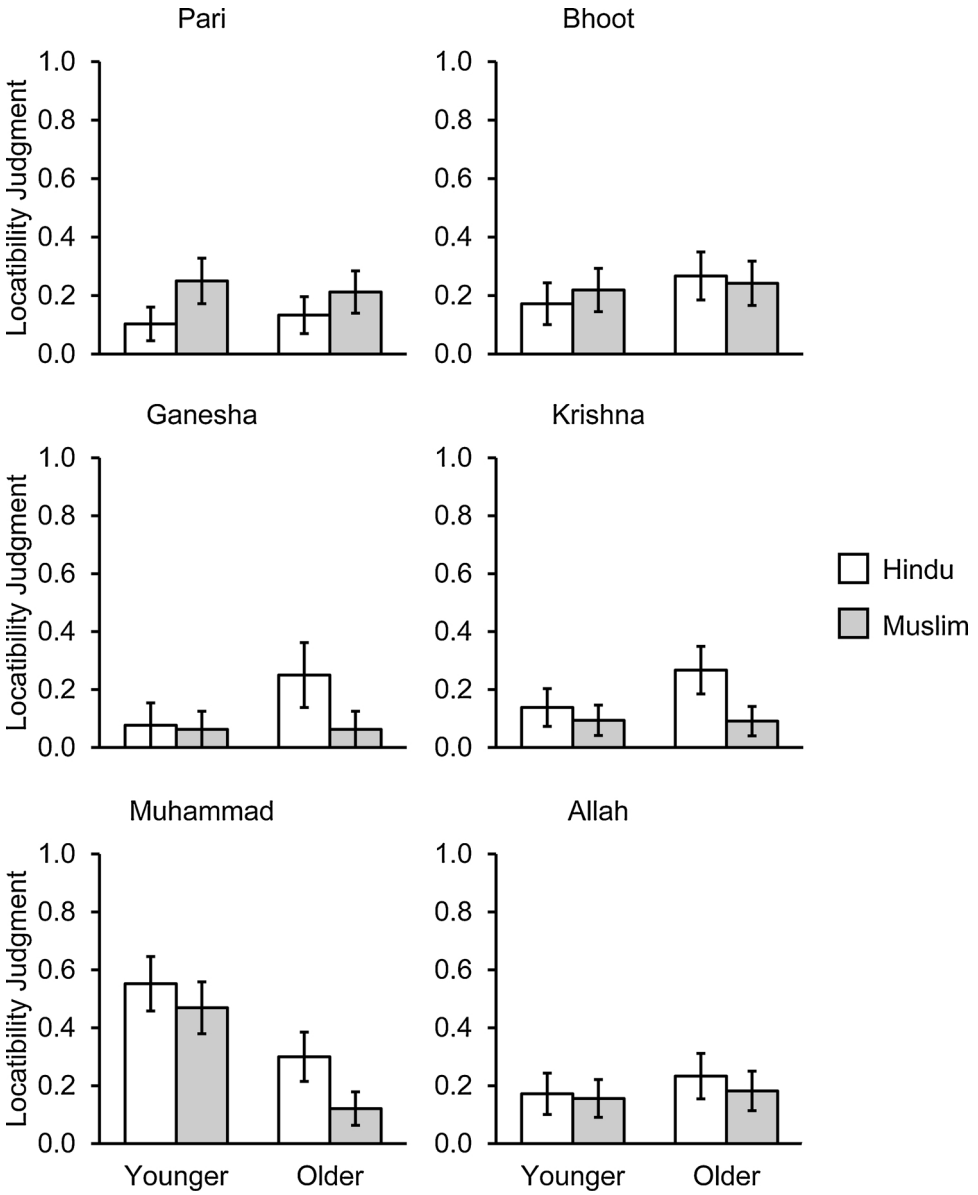


**Fig. 5.** Mean agreement that each being can be located in the real world, analyzed by participants' age and religion. Error bars represent *SE*.

### 3.6. Locatibility judgments

Following the perceptibility questions, participants were asked whether each being could be found in the real world and, if so, where. We asked these questions because Hindu beings are often illustrated in specific locations, whereas Islamic beings are not illustrated at all. Fig. 5 shows how often participants agreed that each being could be found in the real world. Participants' judgments varied by being ($F(5,600) = 4.29$, $p < .001$, $\eta_p^2 = .07$) and by the interaction between being and age ($F(5,600) = 4.61$, $p < .001$, $\eta_p^2 = .08$; see Table 1). Bonferroni comparisons revealed that the effect of being was driven mainly by Mohammad, who was judged more locatable than paris, Ganesha, or Krishna.

The interaction between being and age was also driven by Mohammad (see Table 2). Younger participants judged Mohammad more locatable than older participants did ($F(1,120) = 13.35$, $p < .001$, $\eta_p^2 = .10$) but did not differ from older participants for the other beings. Overall, participants claimed that the beings can be found in the real world only 21% of the time, so they provided few descriptions of where—less than ten per being when analyzed by participants' age and religion. Location descriptions were thus excluded from further analysis, for lack of power.

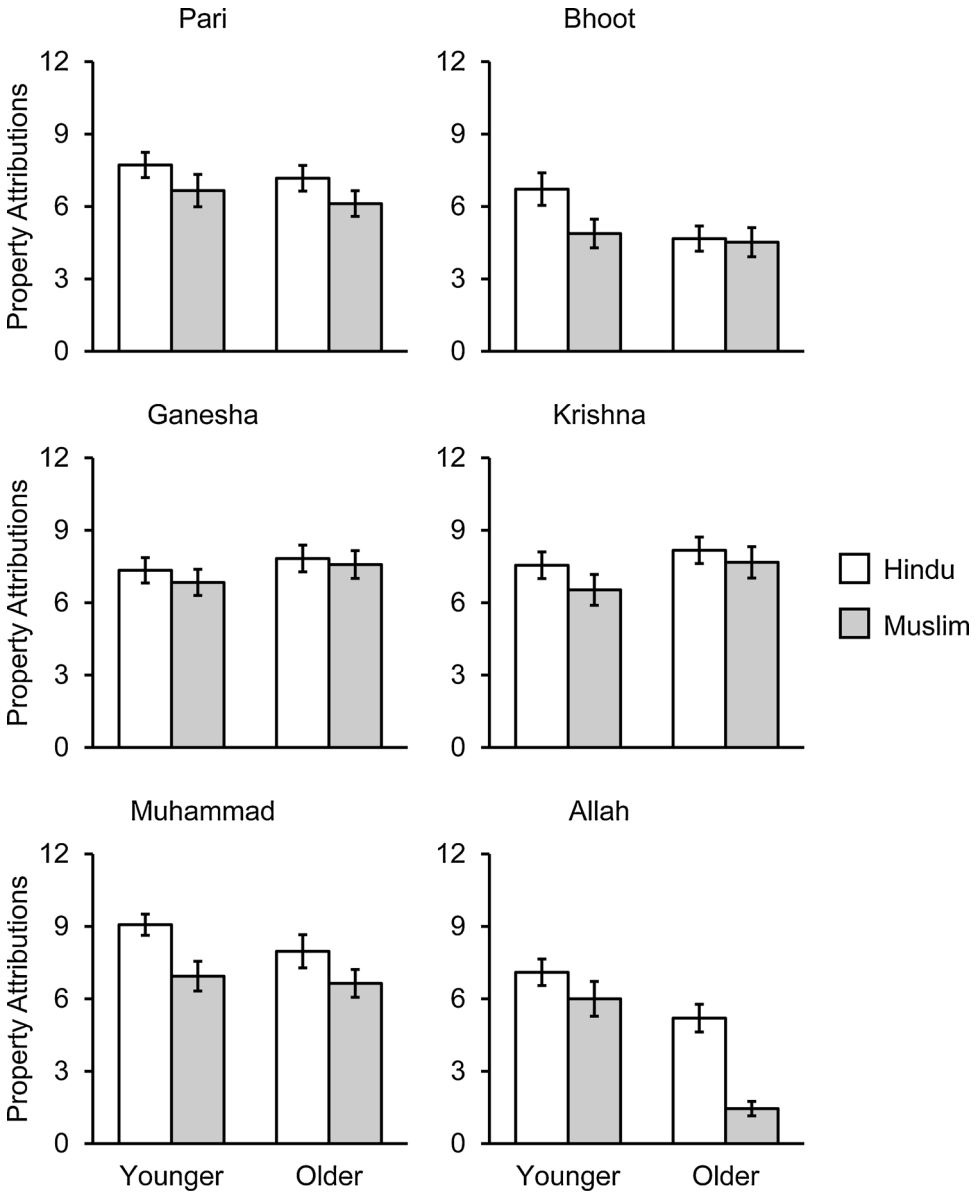


**Fig. 6.** Mean number of human properties attributed to each being (out of 12), analyzed by participants' age and religion. Error bars represent *SE*.

**Table 1**
Effect sizes ($\eta_p^2$) for being (B), age (A), religion (R), and their interactions.

| Type of attribution | Being | Age | Religion | B x A | B x R | A x R | B x A x R |
|---|---|---|---|---|---|---|---|
| Knowledge ratings | .04*** | .02 | .01 | .01 | .39*** | .01 | .01 |
| Belief ratings | .27*** | .02 | .00 | .02 | .43*** | .01 | .03** |
| Descriptions | .23*** | .01 | .17** | .02 | .05* | .03 | .01 |
| Perceptibility judgments | .04*** | .04* | .00 | .03** | .01 | .01 | .01 |
| Locatibility judgments | .07*** | .01 | .04 | .08*** | .01 | .02 | .01 |
| Property attributions | .18*** | .03 | .08** | .08*** | .02* | .00 | .02* |

*$p < .05$, **$p < .01$, ***$p < .001$.

### 3.7. Property attributions

Participants were asked to decide whether the beings possess each of twelve human-relevant properties (listed above). The mean number of properties attributed to each being is displayed in Fig. 6. Property attributions varied by being ($F(5,600) = 28.86$, $p <$

**Table 2**
Effect sizes ($\eta_p^2$) for age (A), religion (R), and their interactions for each being.

| Measure | Being | Age | Religion | A x R |
|---|---|---|---|---|
| Knowledge ratings | Pari | .00 | .09*** | .01 |
| | Bhoot | .03 | .01 | .00 |
| | Ganesha | .00 | .36*** | .01 |
| | Krishna | .00 | .38*** | .00 |
| | Muhammad | .01 | .50*** | .05* |
| | Allah | .02 | .34*** | .00 |
| Belief ratings | Pari | .04* | .00 | .03 |
| | Bhoot | .01 | .00 | .00 |
| | Ganesha | .01 | .43*** | .01 |
| | Krishna | .03 | .40*** | .01 |
| | Muhammad | .01 | .44*** | .07** |
| | Allah | .01 | .49*** | .00 |
| Descriptions | Pari | .03 | .09** | .00 |
| | Bhoot | .01 | .00 | .00 |
| | Ganesha | .05* | .02 | .00 |
| | Krishna | .00 | .00 | .01 |
| | Muhammad | .00 | .20*** | .00 |
| | Allah | .08** | .06* | .00 |
| Perceptibility judgments | Pari | .03 | .00 | .00 |
| | Bhoot | .00 | .01 | .00 |
| | Ganesha | .01 | .00 | .01 |
| | Krishna | .01 | .00 | .00 |
| | Muhammad | .10*** | .00 | .02 |
| | Allah | .04* | .01 | .00 |
| Locatibility judgments | Pari | .00 | .02 | .00 |
| | Bhoot | .01 | .00 | .00 |
| | Ganesha | .02 | .03 | .02 |
| | Krishna | .01 | .03 | .01 |
| | Muhammad | .10*** | .02 | .00 |
| | Allah | .00 | .00 | .00 |
| Property attributions | Pari | .01 | .03 | .00 |
| | Bhoot | .03* | .02 | .02 |
| | Ganesha | .01 | .00 | .00 |
| | Krishna | .02 | .01 | .00 |
| | Muhammad | .01 | .07** | .00 |
| | Allah | .22*** | .14*** | .05* |

*$p < .05$, **$p < .01$, ***$p < .001$.

.001, $\eta_p^2 = .18$) and by participants' religion ($F(1,120) = 9.79$, $p < .01$, $\eta_p^2 = .08$) but not by participants' age (see Table 1). They also varied by three interactions, between being and religion ($F(5,600) = 2.47$, $p < .05$, $\eta_p^2 = .02$), between being and age ($F(5,600) = 9.91$, $p < .001$, $\eta_p^2 = .08$), and between being, age, and religion ($F(5,600) = 2.46$, $p < .05$, $\eta_p^2 = .02$). The main effect of religion was due to lower attributions by Muslim participants, and the main effect of being was due to lower attributions to Allah. Bonferroni comparisons of the beings revealed that participants attributed fewer human properties to Allah than to all beings except bhoots, which were attributed the next fewest properties.

Follow-up ANOVAs revealed that interactions between being, age, and religion were due mainly to nuanced patterns of attribution for Allah (see Table 2). Allah was attributed more human properties by younger participants than older participants ($F(1,120) = 33.85$, $p < .001$, $\eta_p^2 = .22$) and more human properties by Hindu participants than Muslim participants ($F(1,120) = 19.14$, $p < .001$, $\eta_p^2 = .14$). And the difference in attributions between younger and older Hindu participants was smaller than that between younger and older Muslim participants, as revealed by an interaction between age and religion ($F(1,120) = 5.68$, $p < .05$, $\eta_p^2 = .05$). Similar to Allah, Muhammad was also attributed more human properties by Hindu participants than Muslim participants ($F(1,120) = 8.62$, $p < .01$, $\eta_p^2 = .07$), though these attributions did not vary by participants' age. Finally, there was a small effect of age for bhoots, such that younger participants attributed more human properties than older participants did ($F(1,120) = 4.04$, $p < .05$, $\eta_p^2 = .03$).

### *3.7.1. Attributions by domain*

Property attributions were highly correlated across domains. Psychological attributions correlated with biological attributions ($r = .69$, $p < .001$), biological attributions with physical attributions ($r = .72$, $p < .001$), and physical attributions with psychological attributions ($r = .77$, $p < .001$). The more properties a participant attributed in one domain, the more they attributed in the others. That said, there were also reliable domain differences (see Fig. 7). A repeated-measures ANOVA on the number of attributions per domain revealed several effects: a main effect of domain ($F(2,240) = 8.35$, $p < .001$, $\eta_p^2 = .07$), an interaction between domain and age ($F(2,240) = 13.66$, $p < .001$, $\eta_p^2 = .10$) and an interaction between domain, age, and religion ($F(2,240) = 5.21$, $p < .01$, $\eta_p^2 = .04$). Bonferroni comparisons by domain revealed that psychological attributions were more

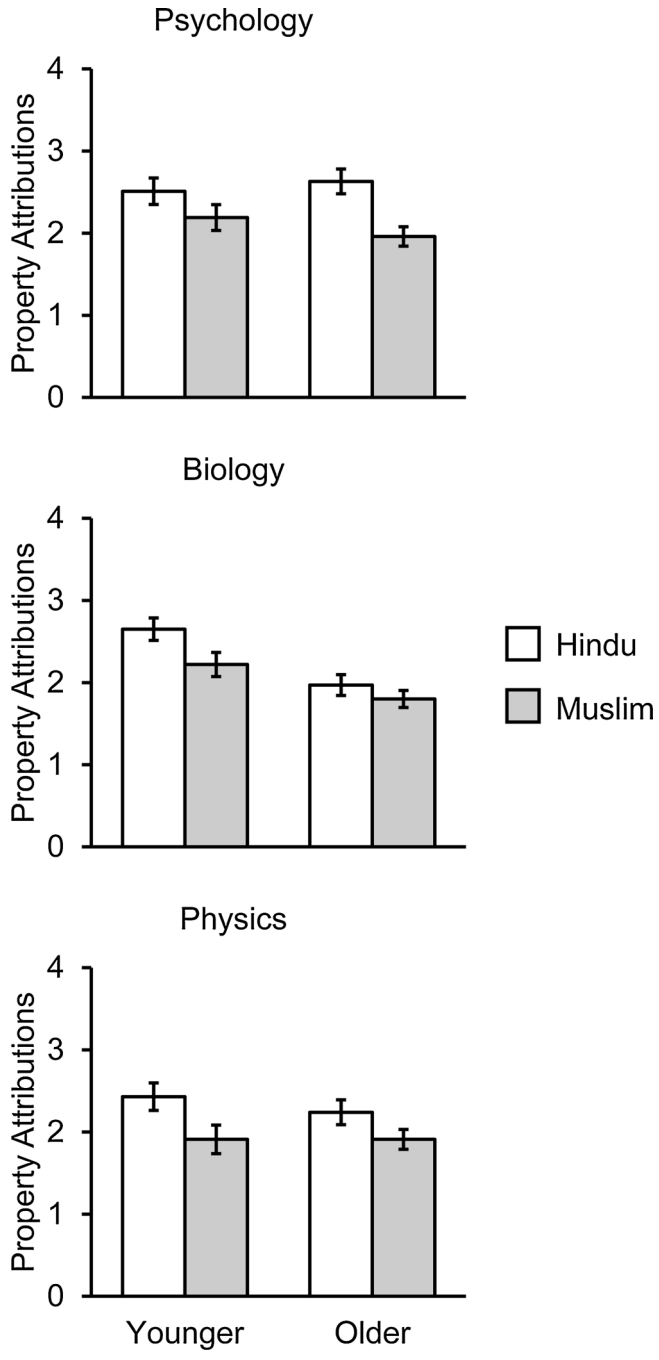


**Fig. 7.** Mean number of psychological, biological, and physical properties attributed to the beings (out of 4), analyzed by participants' age and religion. Error bars represent *SE*.

common than either biological or physical attributions, which were equally common.

We explored the various interactions between domain, age, and religion with ANOVAs for each being (see Table 3). The effect of domain was significant for all beings except Ganesha (pari: $F(2,240) = 10.38$, $p < .001$, $\eta_p^2 = .08$; bhoot: $F(2,240) = 22.08$, $p < .001$, $\eta_p^2 = .16$; Krishna: $F(2,240) = 3.37$, $p < .05$, $\eta_p^2 = .03$; Muhammad: $F(2,240) = 12.13$, $p < .001$, $\eta_p^2 = .09$; Allah: $F(2,240) = 12.07$, $p < .001$, $\eta_p^2 = .09$). Bonferroni comparisons revealed that psychological attributions outnumbered biological attributions for four of the beings (pari, bhoot, Muhammad, Allah) and outnumbered physical attributions for three of the beings (pari, Muhammad, Allah). Ganesha and Krishna were thus outliers on this measure. Participants assigned them as many biological and physical properties as psychological properties.

In addition to a consistent effect of domain, the follow-up ANOVAs revealed a consistent interaction between domain and age

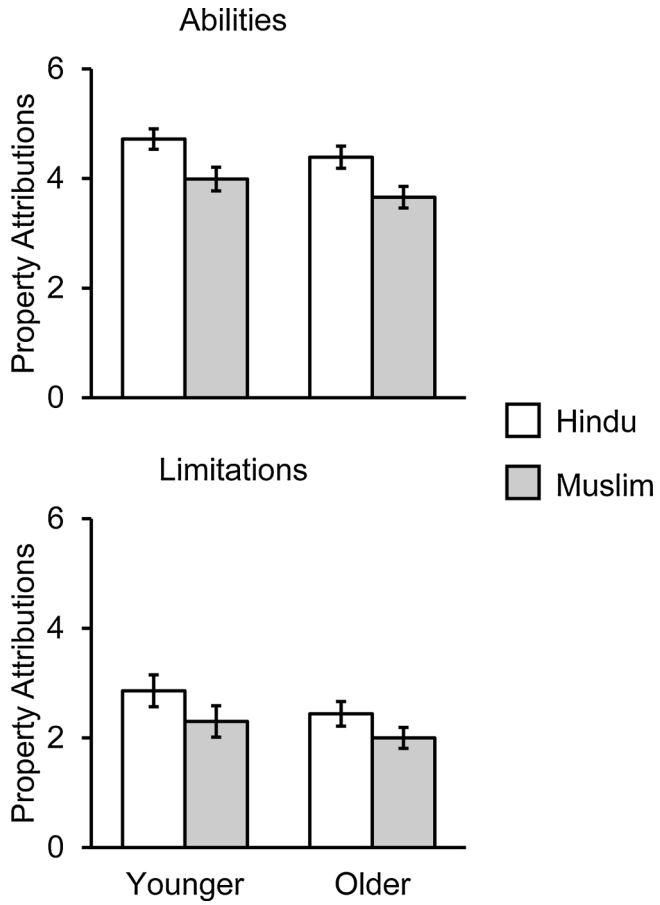


**Fig. 8.** Mean number of abilities and limitations attributed to the beings (out of 6), analyzed by participants' age and religion. Error bars represent *SE*.

**Table 3**
Effect sizes ($\eta_p^2$) for domain (D) and its interaction with age (A) and religion (R) for each being.

| Being | Domain | D x A | D x R | D x A x R |
|---|---|---|---|---|
| Pari | .08*** | .05** | .01 | .00 |
| Bhoot | .16*** | .06*** | .01 | .05** |
| Ganesha | .02 | .05** | .02 | .03* |
| Krishna | .03* | .03* | .01 | .03* |
| Muhammad | .09*** | .05** | .00 | .01 |
| Allah | .09*** | .06*** | .00 | .00 |

*$p < .05$, **$p < .01$, ***$p < .001$.

**Table 4**
Effect sizes ($\eta_p^2$) for valence (V) and its interactions with age (A) and religion (R) for each being.

| Being | Valence | V x A | V x R | V x A x R |
|---|---|---|---|---|
| Pari | .49*** | .00 | .02 | .00 |
| Bhoot | .17*** | .00 | .01 | .01 |
| Ganesha | .61*** | .01 | .01 | .00 |
| Krishna | .12*** | .00 | .00 | .00 |
| Muhammad | .49*** | .00 | .06** | .00 |
| Allah | .55*** | .01 | .04* | .02 |

*$p < .05$, **$p < .01$, ***$p < .001$.

(pari: $F(2,240) = 5.66$, $p < .01$, $\eta_p^2 = .05$; bhoot: $F(2,240) = 8.04$, $p < .001$, $\eta_p^2 = .06$; Ganesha: $F(2,240) = 6.24$, $p < .01$, $\eta_p^2 = .05$; Krishna: $F(2,240) = 3.52$, $p < .05$, $\eta_p^2 = .03$; Muhammad: $F(2,240) = 5.83$, $p < .01$, $\eta_p^2 = .05$; Allah: $F(2,240) = 7.77$, $p < .001$, $\eta_p^2 = .06$). These interactions reflect the fact that younger participants attributed an equivalent number of psychological and physical properties to each being but attributed significantly more biological properties ($t(122) = 4.11$, $p < .001$, $d = .74$). Finally, the follow-up ANOVAs revealed three-way interactions between domain, age, and religion for bhoots ($F(2,240) = 6.47$, $p < .01$, $\eta_p^2 = .05$), Ganesha ($F(2,240) = 3.64$, $p < .05$, $\eta_p^2 = .03$), and Krishna ($F(2,240) = 3.58$, $p < .05$, $\eta_p^2 = .03$). Closer inspection of the data revealed no consistent patterns across beings or domains.

#### *3.7.2. Attributions by valence*

One additional finding emerged when properties were grouped by valence: participants attributed significantly more abilities than limitations ($F(1,120) = 242.44$, $p < .001$, $\eta_p^2 = .67$). This finding was consistent across all six beings (pari: $F(1,120) = 115.03$, $p < .001$, $\eta_p^2 = .49$; bhoot: $F(1,120) = 23.75$, $p < .001$, $\eta_p^2 = .17$; Ganesha: $F(1,120) = 184.55$, $p < .001$, $\eta_p^2 = .61$; Krishna: $F(1,120) = 184.46$, $p < .001$, $\eta_p^2 = .12$; Muhammad: $F(1,120) = 114.75$, $p < .001$, $\eta_p^2 = .49$; Allah: $F(1,120) = 145.93$, $p < .001$, $\eta_p^2 = .55$).

The effect of valence interacted with the effect of religion for Muhammad ($F(1,120) = 7.06$, $p < .01$, $\eta_p^2 = .06$) and Allah ($F(1,120) = 4.89$, $p < .05$, $\eta_p^2 = .04$) because the preference for abilities over limitations was greater for Muslim participants than it was for Hindu participants. In general, though, participants were disinclined to attribute limitations. This disinclination was unexpected, given that abilities come with limitations, at least when instantiated by humans. Any being that can think might also be assumed to forget and make mistakes, and any being that can jump might also be assumed to fall or get tired. On the other hand, supernatural properties like omniscience or omnipotence are, by definition, unlimited, and children's reluctance to attribute limitations to supernatural beings may reflect a growing appreciation of such properties.

## 4. Discussion

How do children develop conceptions of supernatural beings? Prior research in Judeo-Christian populations (e.g., Shtulman, 2008) has found that children initially construe all types of supernatural beings as humans with ontologically unique properties. Later, they come to distinguish religious beings from fictional beings, attributing fewer biological and physical properties to religious beings but continuing to attribute psychological properties.

This suite of findings was replicated in the current study with respect to the difference between the fictional beings bhoot and pari and the Islamic beings Allah and Muhammad. Children in both age groups anthropomorphized the fictional beings to the same extent, describing these beings with many human-relevant predicates and attributing to them many psychological, biological, and physical properties. The Islamic beings, on the other hand, were anthropomorphized more by younger children than by older children. Younger children described Allah with more human-relevant predicates and attributed to Allah more human-relevant properties, particularly biological properties. Younger children were also more likely to claim that Allah and Muhammad can be seen, heard, and touched and that Muhammad can be found in the real world. While there were differences in how children reasoned about particular beings within each category—paris were anthropomorphized more strongly than ghosts and Muhammad was anthropomorphized more strongly than Allah—there were few age-related differences for the fictional beings but many for the Islamic beings.

When Hindu beings are thrown into the mix, a more nuanced pattern emerges. Hindu beings were anthropomorphized as consistently as fictional beings were, despite their inclusion in India's most widely-practiced religion. Older children anthropomorphized Hindu beings in their descriptions, perceptibility judgments, and property attributions as much as the younger children did, and children of all ages anthropomorphized Hindu beings more than Allah. In comparison to Allah, children described Hindu beings with more human-relevant predicates and assigned them more human-relevant attributes (though they did not claim that Hindu beings were more physically perceptible or more physically locatable, as originally hypothesized). Children were also less likely to draw distinctions among the properties attributable to Hindu beings as they did for Islamic beings, assigning Hindu beings as many biological and physical properties as psychological ones.

These results indicate that Hindu beings are conceptualized more similarly to humans than Allah is. This conceptualization was shared by children in both age groups and both religious groups. Muslim children treated Hindu beings similarly to how Hindu children did on all measures of conceptualization. Interestingly, however, Hindu children did not treat Islamic beings similarly to how Muslim children did. On our most comprehensive measure of anthropomorphization—the property-attribution task—Hindu children attributed significantly more human-relevant properties to Islamic beings: 19% more psychological properties to Muhammad and 22% more to Allah, 5% more biological properties to Muhammad and 19% more to Allah, 19% more physical properties to Muhammad and 21% more to Allah. Such differences were more pronounced for older children than for younger children with respect to Allah, indicating that while Muslim children increasingly differentiate Allah from human beings over the course of development, Hindu children do not.

This asymmetry in how Hindu and Muslim children conceptualize beings from the others' religion could be explained by an asymmetry in the evidence they receive about the properties of these beings. Muslim children receive positive evidence for the anthropomorphism of Hindu beings, in the form of anthropomorphic images and statues, but Hindu children do not receive evidence either way for Islamic beings, given Islamic prohibitions against iconography. Hindu children are also less likely to come into contact with Islamic theology than Muslim children are likely to come in contact with Hindu theology, because Hindus are the majority culture in India. Hindu children raised in a Muslim majority culture might differentiate Islamic beings from Hindu beings to a greater extent than Hindu children from India. That said, the difference in knowledge ratings between our Hindu participants and our Muslim

participants was about the same for Islamic beings (33%) and Hindu beings (29%), suggesting that both groups were equally ignorant of the other group's beings. And Hindu participants who reported knowing a lot about Islamic beings did not attribute fewer human properties to those beings than Hindu participants who reported knowing nothing or just a little (Muhammad: $M = 9.4$ vs. $M = 8.4$, $t(57) = 0.83$, $p = .41$; Allah: $M = 5.1$ vs. $M = 6.4$, $t(57) = 1.35$, $p = .18$).

On the whole, these findings suggest that human-being concepts may be a universal starting point for supernatural-being concepts, but whether supernatural-being concepts remain human-like depends on whether the relevant beings are depicted as human-like in speech and images. The emerging differentiation of religious beings from fictional beings observed in previous research does not appear to be characteristic of religious beings in general. Ganesha and Krishna are fully part of Hinduism, and Hindu children reported believing in these beings nearly as strongly as Muslim children reported believing in Allah and Muhammad, but Ganesha and Krishna are represented anthropomorphically within Hinduism, forcing no reinterpretation of their properties. Hindu children reported knowing significantly more about Ganesha and Krishna than Muslim children did, but this difference in knowledge was not associated with a difference in conceptualization, as it was for Muslim children with respect to Allah and Muhammad.

One incidental finding worth noting is the robust difference in children's attribution of abilities and limitations. Children, on average, attributed 30% more abilities than limitations, and the size of this effect for Allah ($d = 1.06$)—the being with the most variable attributions—was larger than the effects of either age ($d = 0.88$) or religion ($d = 0.65$). Our reason for including both abilities and limitations was to ensure that this dimension was balanced across domains, but the dimension itself appears to matter a great deal, possibly because limitations are more human-specific than abilities. Indeed, not only are children reluctant to attribute explicit limitations to religious beings but adults are as well (see Fincham, May, & Kamble, 2019; Hutsebaut & Verhoeven, 1995). More research is needed to determine whether abilities take precedence over limitations because limitations are seen as impossible or merely improbable—i.e., the difference between whether Allah cannot make mistakes or is merely unlikely to make a mistake. Either way, researchers interested in the human aspects of supernatural-being concepts need to take this dimension into account, asking about abilities and limitations in equal measure (as we did) or asking only about abilities (to avoid floor effects).

On the topic of methodology, we note that our study was limited in two significant ways. First, our youngest participants—fourth and fifth graders, averaging 9.9 years of age—were substantially older than the preschool-aged children tested in previous studies of supernatural-being concepts (Richert et al., 2016, 2017; Shtulman, 2008). Preschoolers typically attribute more human properties to religious beings than adults do, but even preschoolers vary in their attributions. Preschoolers raised in Christian households, for instance, attribute more human properties to God than those raised in Muslim households. Thus, the age differences observed in the present study may not indicate that Islamic beings were once conceptualized similarly to humans. Rather, beings like Allah and Muhammad may be conceptualized as distinct from humans from the start, with this distinction growing even larger with time. Further research with preschoolers is needed to assess whether the origins of Islamic-being concepts is truly that of a human being.

Second, our methods rely on self-report, and the concepts indexed through self-report may differ from those indexed by more subtle measures, such as story recall (Barrett, 1998) or a speeded property-attribution task (Barlev, Mermelstein, & German, 2018; Barlev, Mermelstein, & German, 2017). Using the latter, Barlev et al. (2017) found that Christian adults verified God's human-like properties (e.g., "God can hear what I say out loud") more quickly and more accurately than God's super-human properties (e.g., "God can hear what I say to myself"). This task, if adapted for use with children, might reveal that Muslim children's conceptions of Islamic beings continue to be constrained by human properties, even though they explicitly reject those properties when queried directly. Such findings would not undermine the claim that Muslim children's conceptions of divine beings become more abstract with time but would qualify it, raising important questions about when tensions between anthropomorphic and abstract conceptions first emerge and what their consequences might be for belief.

In sum, our findings indicate that the development of supernatural concepts is shaped not just by exposure to those concepts or by their inclusion in one's religion but by both factors. In India, Islamic beings are known to children of varying ages and religions, but they are conceptualized differently by those who have been raised to believe in them. Hindu beings, on the other hand, are conceptualized similarly by believers and nonbelievers alike, regardless of age. These differences likely arise from differences in how Hindu and Islamic beings are represented in speech and images, as well as differences in whether the practice of anthropomorphization is encouraged or discouraged. In Judeo-Christian cultures, the distinction between fictional beings and religious beings is confounded with the distinction between anthropomorphic and abstract representations. When these distinctions are pulled apart, it appears that tendencies to anthropomorphize supernatural beings track the content of the beings' public representations more closely than their inclusion in a religion. Why some beings are depicted more anthropomorphically than others, and whether anthropomorphic depictions are easier to understand than abstract ones, are topics for further investigation.

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