

## THE FORMATION OF BELIEF-BASED SOCIAL PREFERENCES

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Beliefs are invisible contents of the mind, yet young children appear able to reason about beliefs in their minds and those of others. In three experiments, the authors explored the previously unanswered question of the manner and extent to which young children assess types of beliefs. In Experiment 1, 6- to 9-year-old children preferred peers who shared their own beliefs across several belief domains (fact, preference, and ideology) but selectively attributed prosocial behaviors only to those who shared their religious ideology. In Experiments 2 and 3, children additionally attributed prosocial behaviors to those who shared their ideological beliefs rather than to those who shared their behavior. Together, these experiments demonstrate that children form social preferences based on unobservable mental states and that they weigh ideological beliefs particularly strongly when making morally relevant behavioral attributions.

The contents of others' minds ought to be a complete mystery given that they are enclosed in a black box. But among the remarkable features of social cognition is that humans' capacities for inference, generalization, and learning turn the black box into a seemingly transparent one. We behave as if we can see what other minds believe and directly assess their likeness to our own. In fact, adults are so proficient at making sense of other minds that the hard task of knowing and understanding what others believe is a commonplace occurrence in the daily work of interpersonal and intergroup relationships. The goal of the present research is to understand the nature and origins of complex beliefs with ideological roots, such as religious beliefs, by exploring the preferences expressed by young children as a function of the beliefs of others.

Unlike adults, who have had vastly greater experience thinking about others' beliefs, children have less experience pondering what beliefs are, what it means to

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hold them, and what beliefs indicate about underlying disposition and behavior. It makes sense, then, that engaging with the contents of other minds should be more of a challenge for young children than for adults. However, evidence also points to the opposite, showing that young children have a relatively sophisticated grasp of what it means to hold a belief. Even before reaching elementary school, children understand that other people have beliefs, that others' beliefs vary in truth, and that they may match or differ from their own (Wellman, Cross, & Watson, 2001).

What remains unknown is the extent to which children have an adult-like representation of others' beliefs. Specifically, do children, like adults, reason that beliefs provide crucial social information and serve as important indicators of future behavior? Do children also use beliefs to form social preferences? If so, we would learn that this feature of social cognition is sufficiently basic so as not to require much social experience to emerge. However, if children's minds do not show the same pattern of using beliefs to form social preferences, we would learn that acquiring this feature of social cognition requires substantial experience with others' minds and emerges later in development.

## CHILDREN'S GROUP-BASED SOCIAL PREFERENCES

Young children readily express group-based preferences in a number of domains, and racial categories have formed the basis of much of this investigation. For example, in one study, White 5-year-old children viewed images of Black and White actors. Participants reported that they would prefer to befriend the White actor, and they also predicted that babies would prefer to accept toys from the White actor, indicating their assumptions about the early-emerging and socially common nature of racial prejudice (Kinzler & Spelke, 2011). In another line of work, White 6- and 10-year-old children also reported preferring White over Black individuals. Additionally, these participants completed a child version of the Implicit Association Test (Greenwald, McGhee, & Schwartz, 1998), a speeded reaction-time measure of implicit preference. Across ages, participants were faster to pair images of White characters with good words and images of Black characters with bad words, indicating an implicit pro-White preference (Baron & Banaji, 2006; see also Rutland, Cameron, Milne, & McGeorge, 2005). In a different test of implicit bias, White students attending racially homogenous elementary schools interpreted ambiguous situations in a racially biased manner (McGlothlin & Killen, 2010).

Other perceptually salient cues also influence children's preferences. For example, 3-year-old children preferentially learn new information from peers who share their gender and age (Shutts, Banaji, & Spelke, 2010), and elementary schoolchildren prefer to play with children who belong to their gender group (Fabes, Martin, & Hanish, 2003; Martin & Fabes, 2001). Other perceptually salient cues, such as spoken language and accent, also influence children's preferences (Kinzler, Shutts, DeJesus, & Spelke, 2009). Even groups that are artificially created in the laboratory can shape social attitudes. Children typically express greater liking for individuals randomly assigned to share their group membership, particularly when their attention is drawn to perceptual differences between the groups (e.g., T-shirt colors; Bigler & Liben, 2007; Dunham, Baron, & Carey, 2011; Sherif, Harvey, White, Hood, & Sherif, 1954/1961; Tajfel, Billig, Bundy, & Flament, 1971).

Previous research demonstrates that children prefer those who share their group membership, at least when group membership is based on perceptually salient cues inherent in groups that vary by race, gender, language/accents, and visible cues to minimal group membership. Children's use of others' beliefs, which are invisible mental constructs, to form social preferences is less well understood. The current research investigates this question.

## CHILDREN'S KNOWLEDGE ABOUT BELIEFS

Most previous research on the development of belief understanding focuses on theory of mind, or the ability to reason about others' minds as distinct from one's own. Most work in this area has used variations of a single procedure that tests when and how children understand others' beliefs and shows that around the age of 4 children first develop the ability to report that others' beliefs may be incorrect (Wellman et al., 2001; Wimmer & Perner, 1983). Children also distinguish factual beliefs from those reflecting idiosyncratic attitudes (Banerjee et al., 2007; Flavell, Mumme, Green, & Flavell, 1992; Wainryb, Shaw, Langley, Cottam, & Lewis, 2004) and reason that religious beliefs differ from both factual and opinion-based beliefs (Heiphetz, Spelke, Harris, & Banaji, 2013). This past work suggests that the ability to reason about others' beliefs emerges early in life and that children distinguish different types of beliefs along a number of dimensions.

Some work has also investigated the role that others' beliefs may play in children's social preferences. This research has shown that 2-year-old children are capable of reasoning about shared preferences. For example, they preferred to play with novel toys and books that had been endorsed by actors who shared the children's own preferences (Fawcett & Markson, 2010a). Additionally, 3-year-old children preferred to play with those who shared their food and toy preferences (Fawcett & Markson, 2010b). Preschool-aged children also use others' presumed attitudes to inform their social preferences. In this line of work, children preferred White peers who had previously played with other White children over White peers who had previously played with Black children, but only when the choice of play partner was perceived to be truly a choice. In cases where play partners had been selected by the teacher, and thus were uninformative about either partner's racial preferences, participants did not show a preference for either target (Castelli, De Amicis, & Sherman, 2007). This intriguing work lends credence to the hypothesis that others' beliefs may influence children's social preferences, and the current research builds on these past studies by investigating children's preferences on the basis of religious beliefs. Adults demonstrate religious group-based preferences (Rowatt, Franklin, & Cotton, 2005), but prior work has not investigated the developmental origins of preferences based on others' religious beliefs. The current work takes up this important issue.

## CHILDREN'S UNDERSTANDING OF RELIGIOUS CATEGORIES

Among the many categories of beliefs, religious ideologies have special status. We use religion as an example of ideological belief for several reasons. First, religious beliefs have been found cross-culturally (Atran, 2002; Boyer, 2001), and most

people in the world are theists (Lynn, Harvey, & Nyborg, 2009). Second, religion influences a number of outcomes studied by psychologists, including health and well-being (Gillum & Holt, 2010; Jackson & Bergeman, 2011; McCullough, Friedman, Enders, & Martin, 2009; McCullough & Laurenceau, 2005), trust in authority (Van Pachterbeke, Freyer, & Saroglou, 2011; Wisneski, Lytle, & Skitka, 2009), pro-social behavior (Norenzayan & Shariff, 2008; Preston, Ritter, & Hernandez, 2010; Shariff & Norenzayan, 2007), and intergroup bias (Gervais, Shariff, & Norenzayan, 2011; Johnson, Rowatt, & Labouff, 2010, 2012).

Third, unlike other ideologies important to adults, religion is influential even among young children. Taking advantage of this fact allowed us to investigate the developmental origins of adults' cognition. By the time they reach the late preschool and early elementary years, children attribute fewer false beliefs and greater perceptual access to God rather than humans, although the development of this ability may not be linear (Barrett, Newman, & Richert, 2003; Barrett, Richert, & Driesenga, 2001; Knight, Sousa, Barrett, & Atran, 2004; Lane, Wellman, & Evans, 2010; Richert & Barrett, 2005). Five-year-old children categorize others on the basis of religious differences (Diesendruck & haLevi, 2006), and 10-year-old children use religious ideas to explain moral judgments (Nucci & Turiel, 1993). Throughout elementary school, children use religious ideas to inform their understanding of natural phenomena (Kelemen & DiYanni, 2005) and the afterlife (Bering, Blasi, & Bjorklund, 2005). It is clear that young children are capable of reasoning about religious ideas and that such beliefs can play an important role in their lives. What remains unclear is the extent to which such beliefs influence children's social preferences.

## UNANSWERED QUESTIONS AND OVERVIEW OF CURRENT RESEARCH

Previous studies have addressed several questions concerning the development of social preferences and belief-based reasoning, yet several questions remain. First, the preponderance of evidence comes from perceptually salient group-based distinctions, and the role of belief-based differences in development remains underexplored. Preferences that originate from perceptually obvious interpersonal features and those that are more hidden, such as mental state features, may follow similar or divergent developmental trajectories. Both possibilities can be defended. Preferences based on more concealable categories may develop simultaneously with preferences based on perceptual cues because underlying both responses is a single cognitive mechanism of recognizing and using similarity and familiarity in social interaction. On the other hand, belief-based differences are hidden, which may make it harder to discern them and know how to utilize them in affiliation decisions. Developing this ability may take more time than learning to distinguish perceptually salient groups; thus, preferences based on invisible categories may appear later in life. The current work examines belief-based cognition across a wide age range to address the question of whether preferences in these domains develop differently than preferences in other areas.

Second, past work has typically focused on only two types of beliefs. Many studies, including most studies conducted about false-belief understanding, concern factual domains where another person's belief is clearly right or wrong. For ex-

ample, numerous studies have tested children's understanding of beliefs concerning the location of particular objects—beliefs whose correctness is unambiguous and can be verified easily (see Wellman et al., 2001, for a review). In several notable exceptions, researchers have examined personal opinions, such as which flower is the prettiest (e.g., Banerjee et al., 2007; Flavell et al., 1992; Wainryb et al., 2004). However, other beliefs have typically remained untested. This oversight is surprising given that nonfactual beliefs, including ideologies, are so important to social relationships (Baray, Postmes, & Jetten, 2009; Cadge & Davidman, 2006; Haji, Lalonde, Durbin, & Naveh-Banjamin, 2011; Jost, 2006; Ysseldyk, Matheson, & Anisman, 2010). Adult humans care a great deal about others' beliefs, yet psychologists know little about how such use of another's beliefs comes to be so important and pervasive in social life. To address this question, the current work examines the development of reasoning about religious ideologies in addition to the types of mental states that researchers have examined previously, such as factual and opinion-based beliefs.

In three experiments, we examined 6- to 11-year-old children's preferences for members of groups demarcated by belief differences, and we varied the types of beliefs to study the importance of ideological (e.g., religious) beliefs as determinants of social preferences and social relationships. The experimental procedure involved obtaining information about each participant's beliefs and then presenting children with peers who shared or did not share their viewpoints. If the adult form of belief-based social preferences emerges gradually over development, or if children lack the capacity to draw inferences from beliefs to form social relationships, we should observe no belief-based preferences or affiliation choices among children.

## EXPERIMENT 1

To investigate the influence of beliefs on children's social preferences, we presented participants with characters who shared and did not share their beliefs and asked participants to indicate their preference for those characters. We included children between 6 and 9 years old because previous research has shown that children of this age are capable of responding to self-report questions and are able to successfully differentiate others' mental states from their own (Wellman et al., 2001). Additionally, children of this age do not typically provide socially desirable responses unless aspects of the environment have been manipulated to encourage socially desirable responding (Baron & Banaji, 2006; FitzRoy & Rutland, 2010). Using a wide age range allowed us to test for potential developmental differences.

To investigate the generalizability of our findings across belief domains, we tested three kinds of beliefs. Because previous research has investigated children's reasoning about factual and opinion-based beliefs, we used these two belief categories to allow for comparison with prior studies. Additionally, we investigated a third type of belief important to adults—namely, religion.

## METHOD

*Participants.* Participants were 81 children aged 6 to 9 (73% White, 5% African American, 9% Asian American, 1% Hispanic, 11% some other race; 52% female;  $M_{\text{age}} = 7.26$  years,  $SD_{\text{age}} = 1.15$  years). During the study, parents completed a demographic questionnaire asking them to identify the religious affiliation, if any, of their child. Parents identified their child's religious affiliation as Protestant (25%), Catholic (30%), Jewish (12%), Muslim (3%), atheist or agnostic (11%), and "other" (15%); the remaining parents did not answer the question concerning their child's religious affiliation. In this and all subsequent studies, parents who selected "other" were given the choice to write in their child's religious affiliation. Children whose parents wrote in a Christian denomination (e.g., Greek Orthodox) were grouped with other Christian participants in subsequent analyses. Participants were recruited in the northeastern United States from a departmental database and a local museum; they received a sticker or small toy after completing the study.

*Procedure.* Children were seated with an experimenter in front of a computer. In Part 1, the experimenter elicited children's religious, factual, and opinion-based beliefs. For example, the experimenter said, "Some people think that God knows all of our thoughts, and some people think that only we can know all of our thoughts. Which do you think?" (religious item); "Which river do you think is the longest river in the world? Do you think it's the Amazon or the Nile?" (factual item); and "What is your favorite color?" (opinion item; for other items in each category, see Appendix A). Factual beliefs were chosen based on pretesting with adults; adults did not reliably know the correct answer to any of the factual items we used, leading to somewhat greater confidence that any preferences expressed by children indicate a preference for people who share one's own beliefs rather than people who know the correct answer.

In Part 2, the experimenter displayed photographs of two White children of the same gender, approximate age, and attractiveness (as measured by a pretest administered to adults) as each other. The experimenter attributed opposing beliefs to each character; one agreed with the participant while the other disagreed. The photographs were counterbalanced in the following ways: First, each character was portrayed as agreeing with approximately half of the participants and disagreeing with the other half. Second, each character was presented on the left side of the screen for approximately half of the participants and on the right side for the other half. Third, across participants, each photograph was paired with each type of belief. Beliefs concerned opinions (e.g., "This child thinks that [participant's favorite color] is the prettiest color, and this child thinks that [different color] is the prettiest color"), facts (e.g., "This child thinks that the Amazon is the longest river in the world, and this child thinks that the Nile is the longest river in the world"), and religion (e.g., "This child thinks that God knows all of our thoughts, and this child thinks that only we can know all of our thoughts"). Children were exposed to four trials for each belief type (Appendix A).

Experiment 1 contained two main variables of interest measured by questions adapted from Dunham and colleagues (2011) and Kinzler and colleagues (2009) to investigate children's social preferences. First, one item measured *affiliation*: "Which of these children do you think you would rather be friends with?" Second, *goodness* was measured by one good-behavior item ("One of these children helped his/her friends with their schoolwork. Which one of them do you think



did that?") and one bad-behavior item ("One of these children was very naughty in school. Which one of them do you think did that?"). Third, one item served as a manipulation check ("Which of these children do you think is more like you?").

Participants responded to one question on each trial, and the belief-question pairings were counterbalanced across participants. For example, on one trial, one participant might hear, "This child thinks that God knows all of our thoughts, and this child thinks that only we can know all of our thoughts. Which of these children do you think you would rather be friends with?" For another participant, this belief item was paired with a different question (e.g., the good-behavior item). The order of beliefs and questions was randomized and counterbalanced across participants.

## RESULTS

The proportion of trials on which participants selected the similar character served as the dependent measure for both perceived similarity and affiliation. These proportions were compared to chance (.50) using binomial tests. To analyze goodness data, we subtracted the number of times participants selected the similar character when asked about bad behaviors from the number of times they selected the similar character when responding about good behaviors. Thus, positive values indicate that participants attributed more positive than negative behaviors to those who are like them, while scores close to 0 indicate that participants attributed equal numbers of positive and negative behaviors to similar characters. We employed this measure, rather than analyzing responses to good and bad behavior questions separately, to reduce the number of comparisons and therefore decrease the likelihood of Type I error.

*Preliminary Analyses.* Due to the small number of participants from non-Christian religions, it was not possible to examine differences between members of different religious groups. We did conduct a broad analysis separating participants into Christians versus all non-Christians (including children from nonreligious families; dividing participants into Christians and non-Christians was the only split that allowed for relatively equal numbers of participants across groups). This analysis revealed no differences between Christians and non-Christians in responses to any of the dependent variables.<sup>1</sup> Investigating potential differences between members of various non-Christian religions remains an important avenue for future research.

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1. We examined the influence of two additional background variables, gender and location of experiment, on the main dependent variables of interest. We examined gender because this is an important social identity, and we examined testing location because the museum may have been somewhat more distracting than our on-campus testing space, and we wanted to ensure that this potential difference did not significantly alter children's responses in our study. We analyzed a series of  $2 \times 2$  contingency tables, each consisting of one background variable and one dependent measure (e.g., responses to the affiliation measure when it was paired with a factual belief). None of these tests reached significance. A series of independent-samples  $t$  tests probed the influence of background variables on goodness. One significant effect emerged: Museum participants were more likely than on-campus participants to ascribe positive behaviors to those who shared their factual beliefs ( $M_{\text{museum}} = .34$ ,  $SD_{\text{museum}} = .60$ ,  $M_{\text{campus}} = -.04$ ,  $SD_{\text{campus}} = .64$ ,  $t[79] = -2.70$ ,  $p < .01$ ). However, the  $p$  value fell above standard significance levels after applying a Bonferroni correction, suggesting a Type 1 error. Therefore, we collapsed across all demographic variables in subsequent analyses.

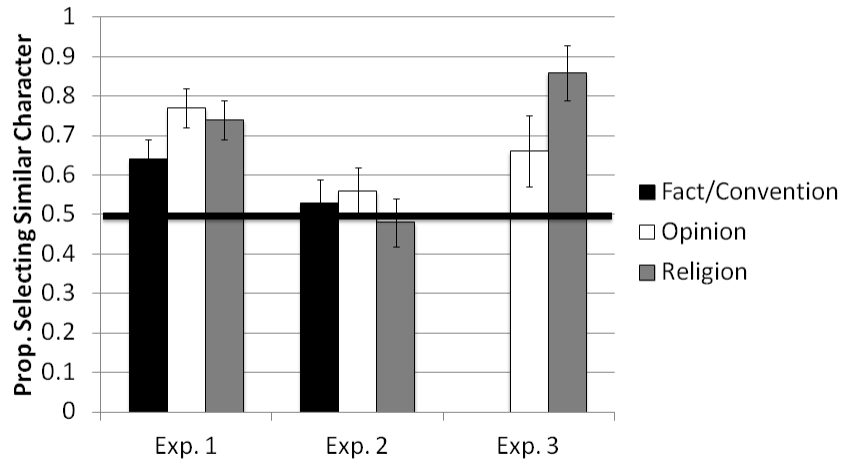


FIGURE 1. Children's social preferences based on belief similarities. Experiment 3 did not include factual or conventional beliefs. Note. Error bars represent the standard error of the mean.

A series of binomial tests revealed that participants were significantly more likely than chance to select the character that shared their beliefs, regardless of belief type, when asked to select the more similar character (83% made this selection when asked about religion, 77% when asked about facts, and 88% when asked about opinions, all  $ps < .001$ ). Cochran's  $Q$ -test was nonsignificant, indicating that belief type did not exert a significant main effect. This result indicates that we successfully manipulated the pairs such that in each pair, one character was perceived as more similar to the participants than the other.

*Primary Analyses.* A series of binomial tests revealed that participants were significantly more likely than chance to select the character that shared their beliefs regardless of belief type when asked which character they would rather befriend (i.e., with which character they would rather affiliate; 73% made this selection when asked about religion, 63% when asked about facts, and 74% when asked about opinions, all  $ps < .05$ ; Figure 1). Cochran's  $Q$ -test was nonsignificant, indicating that belief type did not exert a significant main effect.

One-sample  $t$  tests using 0 as the comparison value indicated that, when determining the goodness of the characters, participants ascribed more positive than negative behaviors to the character that shared their religious beliefs ( $M = .40$ ,  $SD = .71$ , Cohen's  $d = .56$ ,  $t(76) = 4.96$ ,  $p < .001$ ). However, they were equally likely to ascribe good and bad behaviors to characters who shared their factual beliefs ( $M = .11$ ,  $SD = .65$ , Cohen's  $d = .17$ ,  $t(80) = 1.53$ ,  $ns$ ) and opinion-based beliefs ( $M = .06$ ,  $SD = .71$ , Cohen's  $d = .08$ ,  $t(77) = .80$ ,  $ns$ ). A one-way repeated-measures ANOVA revealed a significant main effect of belief type,  $F(2, 146) = 5.59$ ,  $p < .01$ , partial  $\eta^2 = .07$ . Post-hoc pairwise comparisons indicated that religious beliefs differed significantly from both factual beliefs,  $F(1, 76) = 9.09$ ,  $p < .01$ , partial  $\eta^2 = .11$ , and opinion-based beliefs,  $F(1, 73) = 8.33$ ,  $p < .01$ , partial  $\eta^2 = .10$ ; factual and opinion-based beliefs did not significantly differ from each other ( $F < 1$ ; Figure 2).

To examine the influence of participant age on responses, we used two analyses. First, a series of regression analyses investigated the effect of age on children's responses to the goodness item. In each analysis, the participant's age in days was



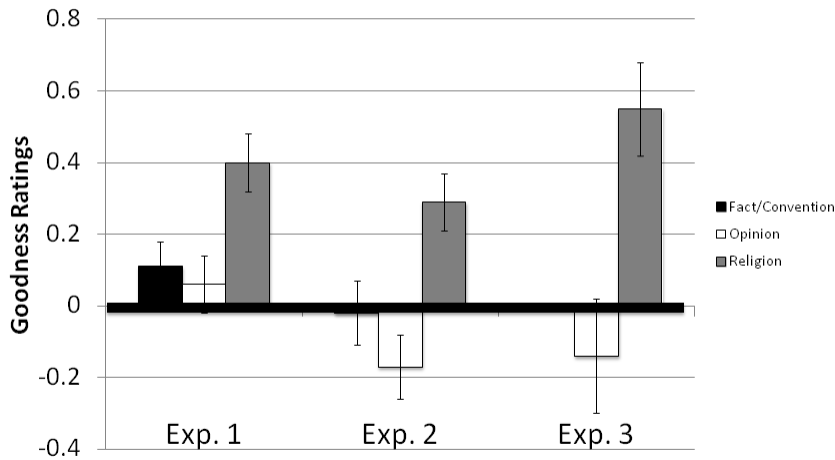


FIGURE 2. Children's ascriptions of positive and negative behaviors to characters that share their beliefs. Positive values indicate that children ascribed more positive than negative behaviors to characters who shared their beliefs. Values near 0 indicate that children ascribed equal numbers of positive and negative behaviors to characters who shared their beliefs. Experiment 3 did not include factual or conventional beliefs. Note. Error bars represent the standard error of the mean.

entered as the predictor variable, and one dependent measure (responses to goodness in the domain of religion, fact, and opinion) was entered as the outcome variable. Second, to examine the influence of participant age on responses to questions concerning affiliation, we used logistic regression analyses, entering participant's age in days as the covariate and responses to the affiliation item as the outcome variable. All analyses were nonsignificant.<sup>2</sup>

## DISCUSSION

Across all domains tested, children preferred to affiliate with peers who shared their beliefs. Additionally, children selectively attributed prosocial behaviors only to peers who shared their religious beliefs. This result points to three aspects of children's cognition.

2. Prior to conducting Experiment 1, we conducted a pilot experiment with 45 children 6 to 9 years old. The procedure was similar to Experiment 1 with two exceptions. First, children's religious beliefs were inferred from parental identification of the child's religion; children were not directly asked to state their own religious views. Second, we used two affiliation questions, two good-behavior questions, and two bad-behavior questions to ensure that results were not an artifact of a particular item. Across domains, participants preferred to affiliate with characters who shared their beliefs rather than those who disagreed (means represent proportion of trials on which participants selected the character who shared their beliefs:  $M_{\text{religion}} = .70$ ,  $SD_{\text{religion}} = .33$ , Cohen's  $d = .61$ ,  $t[21] = 2.88$ ,  $p < .01$ ;  $M_{\text{fact}} = .73$ ,  $SD_{\text{fact}} = .36$ , Cohen's  $d = .64$ ,  $t[23] = 3.11$ ,  $p < .01$ ;  $M_{\text{opinion}} = .81$ ,  $SD_{\text{opinion}} = .25$ , Cohen's  $d = 1.24$ ,  $t[23] = 6.19$ ,  $p < .001$ ). However, children did not use information about belief similarity to selectively attribute prosocial behaviors in any domain tested. In Experiment 1, we queried children about their own religious beliefs to determine whether this more nuanced measure would lead children to attribute more prosocial behaviors to those who shared their religious views. To allow time for this without taxing children's attention spans, we used only one question of each type (affiliation, good behavior, and bad behavior).

First, even young children formed social preference on the basis of invisible beliefs, suggesting that children do not require perceptual differences between individuals or groups in order to form preferences. Rather, during the elementary school years, children prefer those who share their beliefs in a number of domains.

Second, even young children distinguished religious beliefs from the other types of beliefs tested here. They reasoned that individuals who shared their religious beliefs—but not their factual or opinion-based beliefs—were especially likely to perform prosocial behaviors. Children may form this mental association because religious beliefs are more strongly associated with particular actions than are other sorts of beliefs, a point on which we elaborate in the General Discussion.

Third, despite early-emerging preferences for those who shared their factual and opinion-based beliefs, children ascribed equal numbers of positive and negative behaviors to characters who shared their views in these domains. Their social preferences did not lead them to conclude that the character they liked more was a better person overall; rather, children distinguished between their own desire to affiliate with individuals and those individuals' propensity to perform prosocial behaviors. Indeed, desires to affiliate with particular characters did not significantly correlate with attributions of positive behaviors in any domain (fact: Spearman's  $r = .02$ , opinion: Spearman's  $r = .08$ , religion: Spearman's  $r = .11$ , all  $ps > .10$ ), suggesting that at the individual level, these two types of social judgments do not necessarily go together. Even in the case of religion, individual children may hold more positive attitudes toward those who share their beliefs without attributing more positive actions to these characters and vice versa. For young children, such a distinction represents a sophisticated understanding that one's own preference does not necessarily indicate that the person one prefers is better in all respects than less well-liked individuals.

Children's ability to distinguish between their own attitudes and others' behaviors in the domain of beliefs may distinguish this area from other group memberships, including minimal groups. That is, even when children are randomly assigned to groups based on T-shirt color—groups with which the children had no prior experience and which are not socially meaningful outside the experimental context—they both express preferences for and attribute more prosocial behaviors to members of their ingroup rather than the outgroup (Bigler & Liben, 2007; Dunham et al., 2011). However, when presented with characters that shared or did not share their factual and opinion-based beliefs, children failed to attribute more positive than negative behaviors to their ingroup members despite their preferences for characters who shared their beliefs.

## EXPERIMENT 2

The result from Experiment 1 may have been obtained because of a particular aspect of the experimental procedure. The effect may have been particularly robust because children shared 100% of relevant traits with one character and 0% of relevant traits with the opposing character. In daily life, such simple dichotomies are rarely present. Instead, even those who share our beliefs may differ from us along other dimensions. To mimic the complexity of social cognition and also to put the question of belief similarity to a tougher test, in Experiment 2 we created mixtures of matches between the subject and the target, with belief versus behavior being

the basis of similarity. Such a test was able to provide evidence about the relative weight given to beliefs over other features of similarity, that is, behavior.

We selected behaviors as the contrast to beliefs because behaviors are more concrete than beliefs. Whereas beliefs are invisible and must be inferred from words or actions, behaviors can be more readily perceived and interpreted. Because children readily form preferences based on perceptual groupings (Aboud, 1988; Baron & Banaji, 2006; Dunham et al., 2011; Fabes et al., 2003; Kinzler et al., 2009; Kowalski & Lo, 2001; Martin & Fabes, 2001), it is reasonable to expect that they would prefer those who share their behaviors. If children do not show such a preference, this would provide evidence that nonperceptual cues can play an equal or more important role in the formation of social preferences (see Baron, Dunham, Banaji, & Carey, in press, for evidence of the importance of nonperceptual cues in the domain of noun labeling, and Castelli et al., 2007, for such evidence in the domain of race).

## METHOD

*Participants.* Participants were 63 children 6 to 10 years old (73% White, 5% Black, 6% Asian American, 3% Hispanic, 10% some other race; 56% female;  $M_{\text{age}} = 8.27$  years,  $SD_{\text{age}} = 1.42$  years). Parents identified their child's religious affiliation as Protestant (11%), Catholic (33%), Jewish (14%), Muslim (3%), atheist or agnostic (13%), and "other" (24%); one additional parent did not answer this demographic question. We increased the age range by one year to see whether older children might respond differently than younger children. For example, older children may be more aware of social desirability norms (see, e.g., Baron & Banaji, 2006), and their responses could help determine the extent to which social desirability might dampen the effects observed in Experiment 1. We did not recruit younger participants because we were concerned that tracking which character was similar to the participant in which way might be too challenging for younger children. Participants were recruited using a departmental database and received a small toy; all children participated on campus.

*Procedure.* In Part 1, children answered questions about their own beliefs and behaviors. Questions concerned three domains: religion, opinions, and convention. For example, children were asked, "Do you or do you not think that there is only one God?" (religious belief) and, "Do you or do you not celebrate God with other people?" (religious behavior). Beliefs concerning matters of convention replaced the factual beliefs used in Experiment 1 for two reasons. First, a large degree of consensus is an important aspect of the types of factual beliefs we used. Although children do not necessarily know the correct answers, knowledgeable adults have arrived at one answer that experts generally perceive as an accurate reflection of the state of the world. To better generalize the results, we sought to expand to other types of beliefs with a large amount of consensus. Second, it is difficult to determine what a factual behavior might be; however, conventions are associated with both beliefs (e.g., thinking that brushing one's teeth is healthy) and behaviors (e.g., brushing one's teeth regularly).

After responding to questions about their own beliefs and behaviors, participants viewed pairs of characters (represented by photographs similar to those used in Experiment 1 and counterbalanced in the same fashion) on a computer

screen. The experimenter attributed a belief and a behavior to each character and then asked the participant a question about the two characters. In each pair, one character ostensibly shared the participant's belief but not his or her behavior while the other character shared a behavior but not a belief with the participant. For example, someone who responded affirmatively to both sample questions saw one trial where the experimenter said, "This child thinks that there is only one God, but (s)he does not celebrate God with other people. This [other] child celebrates God with other people, but (s)he does not think that there is only one God" (Appendix B).

Items were paired such that both of the following conditions were met: (a) The belief and behavior belonged to the same category (religion, opinion, or convention), and (b) the belief and behavior had previously been rated as equally important by a sample of adults. Thus, any preference for the character that shared one's beliefs likely was not driven by a preference for a character with whom one shared a more important characteristic.

After the experimenter finished attributing beliefs and behaviors to each character in a pair, she asked children one of the questions used in Experiment 1. Question-item pairings and order of categories were counterbalanced as in Experiment 1.

## RESULTS

As in Experiment 1, although we lacked the power to examine potential differences between all religious groups represented in our sample, we conducted a broad analysis comparing Christian and non-Christian participants. A  $2 \times 2$  contingency table revealed a significant relationship between participant religion and responses to the similarity question in the convention category. Eighteen Christians selected the similar character whereas 11 selected the dissimilar one; 10 non-Christians selected the similar character while 20 selected the dissimilar one ( $p < .05$ ; the remainder of participants did not respond to this item). Participant religion did not significantly influence any other responses. Because this was an unexpected effect, and because the  $p$  value fell above the threshold of significance after applying a Bonferroni correction, we analyzed data from Christians and non-Christians together in subsequent tests.<sup>3</sup>

Responses to the question, "Which of these children do you think is more like you?" served as the measure of perceived similarity. This question no longer served as a manipulation check because each character shared one important commonality with participants. A series of binomial tests revealed that participants were more likely than chance to select the character that shared their beliefs when asked about opinions (63% made this choice;  $p < .05$ ) but more likely than chance to select the character that shared their behaviors when asked about religion (63% made this choice;  $p < .05$ ). When asked about conventions, participants were equally likely to select the character that shared their beliefs (46%) and their behaviors ( $ns$ ). A significant Cochran's  $Q$ -test ( $p = .01$ ) indicated a main effect of category. Follow-up McNemar's tests revealed that responses to religion items differed significantly

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3. The effect of gender was analyzed as in Experiment 1. Gender did not influence responses to any dependent measures; therefore, we collapsed across this variable in subsequent analyses.

from responses to opinion items ( $p < .01$ ); no other pairwise comparisons reached significance.

Responses to the question, "Which of these children do you think you would rather be friends with?" served as the measure of affiliation. Across categories, a series of binomial tests did not reveal a preference for either character (48% selected the character that shared their religious beliefs, 52% selected the character that shared their conventional beliefs, and 56% selected the character that shared their opinions, all  $ps > .10$ ). Cochran's  $Q$ -test was nonsignificant, indicating that category type did not exert a significant main effect. This result may have occurred because each character shared one meaningful characteristic with participants, a point to which we return in Experiment 3.

The data on goodness were analyzed similarly to Experiment 1. We subtracted the number of times participants selected the character that shared their beliefs when asked about bad behaviors from the number of times participants selected the character that shared their beliefs when asked about good behaviors. A series of one-sample  $t$  tests using 0 as the chance comparison revealed that participants attributed more positive than negative behaviors to the character that shared their religious beliefs ( $M = .29$ ,  $SD = .63$ , Cohen's  $d = .46$ ,  $t(62) = 3.58$ ,  $p = .001$ ). Furthermore, they attributed more positive behaviors to the character that shared their opinion-based behaviors rather than beliefs ( $M = -.17$ ,  $SD = .68$ , Cohen's  $d = -.25$ ,  $t(62) = -2.02$ ,  $p < .05$ ). Participants did not use information about conventional beliefs and behaviors to differentially attribute positive and negative actions ( $M = -.02$ ,  $SD = .71$ , Cohen's  $d = -.03$ ,  $ns$ ). A repeated-measures one-factor ANOVA revealed a main effect of category,  $F(2, 124) = 6.84$ ,  $p < .01$ , partial  $\eta^2 = .10$ . Follow-up analyses revealed that responses to religious items differed both from responses to opinion-based items,  $F(1, 62) = 12.61$ ,  $p = .001$ , partial  $\eta^2 = .17$ , and from responses to conventional items,  $F(1, 62) = 6.67$ ,  $p = .01$ , partial  $\eta^2 = .10$ ; however, responses to opinion-based items and conventional items did not significantly differ from each other,  $F(1, 62) = 1.44$ ,  $ns$ .

As in Experiment 1, we used bivariate correlations to examine the relationship between our two primary dependent measures. We did not find significant correlations between affiliative desire and behavior attribution in any domain tested (convention: Spearman's  $r = .16$ , opinion: Spearman's  $r = -.04$ , religion: Spearman's  $r = .08$ , all  $ps > .10$ ), indicating that judgments about affiliation and judgments about behaviors may represent distinct processes for young children. We also examined the influence of participant age on responses using a series of linear and logistic regressions, as described in Experiment 1. All analyses failed to reveal a significant influence of age on children's responses.

## DISCUSSION

Experiment 2 offered an important replication of the behavioral ascription results obtained in Experiment 1, in which children attributed more positive than negative behaviors to characters who shared their religious beliefs. The new result obtained in Experiment 2 showed that participants attributed more positive behaviors to peers who shared their religious beliefs even when the contrasting character shared their meaningful behaviors. This result highlights the uniqueness of religion as compared with the other categories tested. Additionally, the finding

is particularly surprising given the subtlety of the manipulation. As discussed earlier, beliefs and behaviors are closely interrelated; nevertheless, in the domain of religion, participants were more likely to attribute prosocial behaviors based on a similarity of beliefs, not behaviors.

Some aspects of the findings of Experiment 2, however, may remain puzzling. For example, participants perceived the character who shared their religious beliefs to be *less* similar to themselves than the character who shared their religious behaviors, yet they nevertheless attributed more positive behaviors to the character who shared their religious beliefs. It is possible that young children prioritize behaviors over beliefs in judgments of similarity because the behaviors they perform on a regular basis are more salient aspects of similarity than invisible beliefs. For example, children raised in religious households may spend more time attending services than thinking about theology, making behavioral similarities especially salient. On the other hand, parents and religious leaders may draw explicit connections between religious beliefs and moral behavior (e.g., “God wants us to help others”), leading children to infer that those who share their religious beliefs are more likely to perform positive behaviors (see the General Discussion for an elaboration on this point).

### EXPERIMENT 3

Experiment 2 demonstrated that children selectively attributed prosocial behaviors to characters who shared their religious beliefs rather than their behaviors. The purpose of contrasting beliefs with behaviors was to determine whether children emphasized beliefs to a greater extent than a category that is perceptually salient, closely associated with beliefs, and influential in everyday life. In creating contrasting characters along the dimensions of belief and behavior, however, it was also necessary to create characters who espoused contradictions. For example, children who responded that they believed in only one God (belief) and celebrated God with other people (behavior) learned about a character who celebrated God with other people but did not believe in only one God, a combination that may have been complex if not seemingly inconsistent to participants who were raised in a predominantly Christian, monotheistic culture. To address this issue, we conducted Experiment 3 by creating differences of belief and behavior that did not lead to such unusual characters. Specifically, we adapted behavioral manipulations from prior experiments conducted with novel groups (e.g., Bigler & Liben, 2007; Dunham et al., 2011) to allow us to compare our results with previous research.

### METHOD

*Participants.* Participants were 59 children 6 to 11 years old (78% White, 2% Black, 10% Asian American, 3% Hispanic, 7% some other race; 53% female;  $M_{\text{age}} = 8.36$  years,  $SD_{\text{age}} = 1.61$  years). Again, we increased the age range to investigate potential differences in responding between older and younger children. Parents identified their child’s religious affiliation as Protestant (20%), Catholic (29%), Jewish (5%), Muslim (3%), atheist/agnostic (15%), and “other” (15%); the remaining



parents did not answer the question concerning their child's religious affiliation. Recruitment was identical to Experiment 1.

*Procedure.* In Part 1, children answered the religion and opinion-based belief questions used in Experiment 1 and were assigned to a behavioral similarities condition. For half of the participants, the behavior was nonperceptual. These children selected one of two pieces of paper from the experimenter's closed hands. If they selected the paper marked "head," they tapped their head for 60 seconds; if they selected the paper marked "tummy," they rubbed their stomach for 60 seconds. Later in the session, participants were told that one character had performed the same behavior as them, but they did not observe the individual performing the behavior. Like participants in Experiment 2, these children were told that someone shared their behavior without having the chance to observe the shared behavior take place.

Because prior work points to the importance of perceptual similarities in children's social preferences, we also included a condition in which behaviors were based on physical cues. Thus, the remaining half of the participants selected one of two colored pieces of paper from the experimenter's closed hands and then put on a shirt of the same color as the paper they had selected (a procedure used in previously published research, e.g., Dunham et al., 2011).

All participants then answered eight questions related to the behavior they had performed. These questions matched the format of the questions about participants' beliefs and were intended to ensure that beliefs and behaviors were equally salient to participants. Approximately half of the participants answered questions about their own beliefs first, while the other half performed a behavior and answered behavior-related questions first.

In Part 2, participants viewed photographs similar to those used in Experiments 1 and 2 on a computer screen. In eight experimental trials, the experimenter attributed a belief and behavior to each character and then asked the participant a question about the two characters. In each pair, one character ostensibly shared the participant's belief but not his or her behavior, while the other character shared a behavior but not a belief with the participant. For example, someone who reported that she believed God could do miracles and was assigned to wear a red T-shirt saw one trial where the experimenter said, "This child thinks that God can do miracles, just like you do, and she is wearing a green shirt. This [other] child is wearing a red shirt, just like you are, and she thinks that no one can do miracles."

In four control trials, the experimenter simply revealed that one character shared a behavior with the participant while the other did not, without providing any information about beliefs. After the experimenter finished describing each character in a pair, she asked children one of four questions used in Experiments 1 and 2, counterbalanced in the same way.

## RESULTS

As in previous studies, we did not find significant differences between Christian and non-Christian participants, and subsequent analyses collapsed across this variable. Similarly, we used independent-samples *t* tests to examine the effect of behavior (perceptual vs. nonperceptual) on goodness. Because affiliation was a

dichotomous outcome measure, we examined the effect of behavior type on affiliation using  $2 \times 2$  contingency tables. Behavior type did not reliably influence responses to either affiliation or goodness items; therefore, we collapsed across this variable in subsequent analyses.<sup>4</sup>

As in earlier studies, gender did not significantly influence responses to any dependent measures. Because the few significant effects of background factors were unexpected and did not cohere into a consistent pattern, we collapsed across all background variables in subsequent analyses.

Responses to the question, "Which of these children do you think is more like you?" served as the measure of perceived similarity. A series of binomial tests revealed that participants were significantly more likely than chance to select the character that shared their beliefs when asked about opinions (90% made this choice;  $p < .001$ ) and religion (92% made this choice;  $p < .001$ ); however, participants did not differ from chance in the control condition (49% selected the character that had nothing in common with them, *ns*). A significant Cochran's  $Q$ -test ( $p < .001$ ) indicated a main effect of category. Follow-up McNemar's tests revealed that responses to control items differed significantly from responses to opinion and religion items ( $ps < .001$ ); opinion and religion items did not differ from each other.

Initial results indicated that participants failed to show a preference for the character that shared their behavior when the contrasting character had no commonalities with the participant. Thus, in addition to analyzing the full data set, we conducted the same analyses on the 29 children who preferred to affiliate with the character that shared their behavior over the character that had nothing in common with them.<sup>5</sup>

Results from analyses conducted on the full data set were as follows: First, participants were significantly more likely than chance to select the character that shared their beliefs when asked about opinions (73% made this choice; binomial  $p < .001$ ) and religion (78% made this choice; binomial  $p < .001$ ); however, participants did not differ from chance in the control condition (44% selected the character that had nothing in common with them, *ns*). A significant Cochran's  $Q$ -test ( $p < .001$ ) indicated a main effect of category. Follow-up McNemar's tests revealed that

4. A  $2 \times 2$  contingency table revealed a significant relationship between participant religion and affiliation in the control category only. Five non-Christians reported that they would rather be friends with the character that shared their behavior, whereas 10 selected the character that had nothing in common with them; 22 Christians selected the character that shared their behavior, while 10 selected the character that had nothing in common with them. These differences were statistically significant,  $p < .05$ . Additionally, Christian children were more likely to attribute positive behaviors to the character that shared their behavior in the control condition ( $M_{\text{Christian}} = -.29$ ,  $SD_{\text{Christian}} = .74$ ,  $M_{\text{non-Christian}} = .27$ ,  $SD_{\text{non-Christian}} = .70$ ,  $t[44] = 2.43$ ,  $p < .05$ ), whereas non-Christian children were more likely to attribute positive behaviors to the character that shared their behavior in the religion condition ( $M_{\text{Christian}} = .50$ ,  $SD_{\text{Christian}} = .67$ ,  $M_{\text{non-Christian}} = -.06$ ,  $SD_{\text{non-Christian}} = .03$ ,  $t[47] = -2.56$ ,  $p < .05$ ). Children who participated in the museum were also more likely to attribute positive behaviors to the character that shared their behavior in the control condition ( $M_{\text{museum}} = -.24$ ,  $SD_{\text{museum}} = .71$ ,  $M_{\text{laboratory}} = .24$ ,  $SD_{\text{laboratory}} = .79$ ,  $t[52] = 2.35$ ,  $p < .05$ ). Additionally, a significant relationship emerged between behavior type and affiliation in the religion category. Ten children in the perceptual condition reported that they would rather be friends with the character that shared their behavior, whereas 19 selected the character that shared their beliefs; all 27 children who participated in the nonperceptual condition selected the character that shared their beliefs. These differences were statistically significant,  $p < .001$ .

5. We selected children on the basis of their responses to the affiliation question because this item has shown the most robust effects in prior research. In our full sample, responses to the affiliation item were correlated with responses to the goodness item ( $r = .37$ ,  $p < .01$ ), suggesting that children's preferences for the similar character cohered and were not driven by chance alone.

responses to control items differed significantly from responses to opinion and religion items ( $ps = .001$ ); opinion and religion items did not differ from each other.

Second, participants attributed more positive than negative behaviors to the character that shared their religious beliefs ( $M = .37$ ,  $SD = .75$ ,  $t[56] = 3.72$ ,  $p < .001$ ); no other behavioral comparisons reached significance. A repeated-measures one-factor ANOVA revealed a main effect of category,  $F(2, 106) = 3.86$ ,  $p < .01$ . Follow-up pairwise comparisons revealed that responses to religious items differed both from responses to opinion-based items,  $F(1, 56) = 11.83$ ,  $p = .001$ , and from responses to control items,  $F(1, 53) = 9.38$ ,  $p < .01$ ; however, responses to opinion-based items and control items did not significantly differ from each other.

Because these children reported preferring the character that shared their behavior in the control condition, one might predict that this preference would lead them to prefer the character that shared this cue over the character that shared their beliefs; any belief-based preferences in this subset of children yield particularly strong evidence in favor of the hypothesis that beliefs are particularly important.

Replicating the results from the full data set, participants were more likely than chance to select the character that shared their beliefs when asked who was more like them in both the religion category (97% made this choice; binomial  $p < .001$ ) and the opinion category (93% made this choice; binomial  $p < .001$ ). McNemar's test revealed that responses to religion and opinion-based items did not significantly differ from each other.

A binomial test revealed that participants reported that they would rather affiliate with (befriend) the character that shared their religious beliefs rather than the character that shared their behavior (86% of participants made this choice;  $p < .001$ ). Although the majority (66%) of participants also selected the character that shared their beliefs in the opinion category, this result no longer reached significance, perhaps due to a drop in power. McNemar's test revealed that responses to religion and opinion-based items did not significantly differ from each other.

Goodness data were analyzed similarly to Experiments 1 and 2. A one-sample  $t$  test using 0 as the comparison revealed that participants attributed more positive than negative behaviors to the character that shared their religious beliefs ( $M = .55$ ,  $SD = .69$ , Cohen's  $d = .80$ ,  $t(28) = 4.33$ ,  $p < .001$ ); however, participants responded at chance levels when attributing behaviors to characters in the opinion category. A paired-samples  $t$  test revealed a significant difference in responses to these two categories,  $t(28) = 3.70$ ,  $p = .001$ , Cohen's  $d = .69$ . Even children who reported preferring the character that shared their behavior in the control condition placed a stronger emphasis on beliefs, replicating the patterns observed in the full data set.

As in Experiments 1 and 2, we used bivariate correlations to examine the relationship between our two primary dependent measures among individuals who reported preferring the character that shared their behavior when the contrasting character did not share any relevant characteristics with the participant. Unlike in earlier experiments, a significant correlation emerged between affiliative desire and attributions of positive behaviors in both domains tested (opinion: Spearman's  $r = .37$ ,  $p < .05$ ; religion: Spearman's  $r = .60$ ,  $p = .001$ ). We did not test for a correlation in the control condition because this sample was selected based on responses to the affiliation item in that condition. These results are surprising given the absence of a significant correlation in Experiments 1 and 2, which had larger sample sizes. Due to the relatively lower sample sizes in Experiment 3, these significant correlations could have been the result of a Type 1 error. Alternatively,

they could indicate that children's affiliative judgments cohere with their moral judgments in some contexts, perhaps in cases where one character shares a much more meaningful group identity with the participant.

Also as in Experiments 1 and 2, we examined the influence of participant age among individuals who reported preferring the character who shared their behaviors in the control condition on responses using a series of logistic and linear regressions. None of these analyses revealed significant effects.

Although linear regressions did not reveal age effects in any of the experiments presented here, this may have been due to lack of power. To address this concern, we conducted additional analyses, collapsed across experiments, with the youngest participants (6-year-old children:  $N_{\text{Exp1}} = 28$ ,  $N_{\text{Exp2}} = 11$ ,  $N_{\text{Exp3}} = 10$ ). A series of binomial tests using .50 as the comparison value revealed that 6-year-old children preferred to befriend peers who shared their opinion-based beliefs (33 selected the similar character while 14 selected the dissimilar character,  $p < .01$ ) but responded at chance during religion trials (29 selected the similar character while 18 selected the dissimilar character, *ns*). This analysis was not possible with the third category because the belief type changed across experiments (factual beliefs in Experiment 1, conventional norms in Experiment 2, and control items in Experiment 3). A series of one-sample *t* tests using 0 as the comparison value revealed that 6-year-old children attributed more positive than negative behaviors to those who shared their religious beliefs,  $t(46) = 2.66$ ,  $p < .05$ , but not to those who shared their opinion-based beliefs,  $t(46) = .37$ , *ns*.

## DISCUSSION

The purpose of Experiment 3 was to determine the extent to which children demonstrated belief-based preferences when beliefs were compared with behavioral similarities that did not create contradictory characters. Replicating Experiment 1, children preferred to affiliate with characters that shared their religious beliefs, demonstrating that beliefs in this domain are a stronger determinant of social preference than are behavioral similarities. Additionally, children attributed more prosocial behaviors to those who shared their religious views, demonstrating that religious similarity influenced perceptions of goodness.

Examining participants across all three experiments, we found that even the youngest participants in our samples selectively attributed prosocial behaviors to those who shared their religious beliefs. The majority of 6-year-old children also preferred to befriend the character who shared their religious beliefs, but this result failed to reach significance. This lack of significance may be due to insufficient power; even collapsing across experiments may not have resulted in sufficient power to detect an effect using a nonparametric test, which typically requires greater power than parametric analyses to reach significance. Alternatively, this result could suggest that selective attribution of positive behaviors emerges earlier in development than social preferences. However, this explanation seems unlikely given that children of this age report social preferences based on social group memberships such as race (Baron & Banaji, 2006) and language/accents (Kinzler et al., 2009). Additionally, it appears improbable that 6-year-olds assumed that some beliefs lead to better behaviors while at the same time failing to prefer individuals

who espouse those beliefs. Nevertheless, these results suggest that the tendency to attribute positive behaviors to those who share one's own religious beliefs may be somewhat stronger in the youngest participants than the tendency to prefer those who share their beliefs.

## GENERAL DISCUSSION

Three experiments examined the influence of others' mental states on the development of social judgments. Experiment 1 demonstrated that 6- to 9-year-old children preferred to affiliate with peers who shared their religious, factual, and opinion-based beliefs, and Experiments 2 and 3 revealed that children selectively attributed positive behaviors to those who shared their religious beliefs.

### BELIEF-BASED PREFERENCES

The current studies demonstrate that children prefer to affiliate with peers who share their beliefs when those characters are contrasted with individuals who do not share a socially meaningful trait with the participant. This result joins two literatures that have, up to now, largely remained separate.

First, the present research contributes to the literature on children's developing understanding of mental states. By the age of 4, children can articulate their understanding that some beliefs are false and may differ from their own (Wimmer & Perner, 1983), and during the elementary school years, children differentiate beliefs along this dimension. For example, they recognize that while factual beliefs may be false, opinion-based beliefs have no one true answer (Banerjee et al., 2007; Flavell et al., 1992; Heiphetz et al., 2013; Wainryb et al., 2004). However, previous work has not examined the ways in which reasoning about others' minds might influence preferences for those whose beliefs differ from our own. Beliefs do not exist in isolation—they are a part of every individual we meet. Thus, the question of how belief-based reasoning influences developing social judgments is crucial, yet it has not been investigated previously. The current work contributes to the literature on belief-based understanding by demonstrating that children use others' beliefs as a basis for social judgments. They appear to do so to the same extent regardless of whether the belief concerns matters of objective fact, idiosyncratic preference, or religion.

Second, the current finding expands psychologists' theoretical understanding of the nature of intergroup preference. Previous research demonstrates that adults prefer those who share their beliefs (Houts, Robins, & Huston, 1996; McPherson, Smith-Lovin, & Cook, 2001). The current work demonstrates that the origins of this preference lie early in development, suggesting that prolonged exposure to others' beliefs is not necessary for belief-based preferences to emerge. Rather, such preferences appear to be in place as early as the elementary school years.

## BELIEF-BASED JUDGMENTS OF GOODNESS

When asked who had performed a prosocial or antisocial behavior, children responded differently than when indicating a simple affiliation preference. In Experiment 1, children used information about beliefs to infer a character's behavior only when the similarity was based on the participant's religious beliefs. In this case, children ascribed more positive than negative behaviors to the character that was more like them. The uniqueness of religious beliefs persisted in Experiments 2 and 3, in which participants ascribed more positive behaviors to those who shared their religious beliefs rather than behaviors.

There are at least two reasons why children may have distinguished religion from the other categories we tested. First, religion may be more socially meaningful than beliefs concerning convention, opinion, or fact. In fact, religion is so meaningful that humans have split themselves into social categories on the basis of religious differences and often refer to themselves using noun labels (e.g., "I am a Christian"), potentially underscoring the importance of this category (Gelman & Heyman, 1999; Waxman, 2010). On the other hand, it is uncommon to see such categorization on the basis of any other domains studied in the current research (e.g., "I am a blue-lover"). However, if children responded differently to religion because they perceived belief differences in this domain to be the most meaningful, it is unclear why the preference for those who share one's religious beliefs was not stronger than preferences based on other belief domains in Experiment 1.

A second explanation posits that beliefs and behaviors are most closely knit in the domain of religion. As described previously, mental states and actions are interwoven across many areas of life; however, this connection may be particularly strong in religious domains. It is here that children learn that some beliefs and behaviors are good or right while others are bad or wrong. For example, children raised in monotheistic families may learn that it is important to believe in only one God and, because of that belief, it is also important to obey God. Even religions that emphasize behaviors, such as Judaism and Catholicism, nevertheless narrate behaviors as arising from or being caused by beliefs. For example, confession may be of primary importance to a Catholic, but this importance most likely stems from belief in God (otherwise, the practice of confessing to God makes little sense). Likewise, keeping kosher may be particularly important to some Jews as a way of maintaining community ties, but even though this is not explicitly a religious belief, the belief ("maintaining community ties is important") leads to the behavior (keeping kosher). Children who observe belief-based explanations of behaviors may learn to place particular weight on information about someone's religious beliefs, a connection that does not occur in domains where beliefs are not narrated as the primary causes of behavior. For example, children do not learn that it is important to believe that blue is the prettiest color and that therefore it is also important to wear blue clothing. Investigating this possibility, and potential differences between children raised in religious families and children raised in secular families that do not reference belief when explaining why individuals should engage in particular behaviors, remains a fruitful avenue for future research.



## CONSISTENCY ACROSS DEVELOPMENT

The current work demonstrates that children across a wide span of ages respond similarly to peers who share and do not share their beliefs. This is a surprising result given developments in other skills across these ages. For example, between the ages of 6 and 11 years, children experience increases in executive function (Best, Miller, & Jones, 2009; Romine & Reynolds, 2005) and social desirability concerns (Baron & Banaji, 2006; FitzRoy & Rutland, 2010). The latter developmental change makes it particularly surprising that no developmental differences emerged in the current work. That is, even the oldest children did not appear to find it socially undesirable to report belief-based social preferences. Examining the causes of this effect remains a fruitful avenue for future research.

It appears that at least some aspects of the ways children use others' beliefs to inform social preferences and judgments remain stable across development. It may be the case that children do not require vast experience with others' beliefs for these aspects of social cognition to emerge. Rather, even limited experience encourages children to prefer those who share their beliefs and to associate religious similarity with prosocial behaviors, and increasing exposure to others' beliefs does not seem to change these initial judgments. This finding suggests that adults' preferences for those who share their beliefs have their origins in early development and that their formation does not require large amounts of sociocultural experience.

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## APPENDIX A: EXPERIMENT 1 STIMULI

### RELIGION ITEMS

This child thinks that God knows all of our thoughts, and this child thinks that only we can know all of our thoughts.

This child thinks that after people die and are buried, all of them stay here in the ground, and this child thinks that after people die and are buried, some of them go to heaven.

This child thinks that when we pray out loud, God can hear us, and this child thinks that when we pray out loud, only other people can hear us.

This child thinks that no one can do miracles, and this child thinks that God can do miracles.

## OPINION ITEMS

This child thinks that [participant's favorite dessert] is the tastiest dessert, and this child thinks that [different dessert] is the tastiest dessert.

This child thinks that [participant's favorite television character] is the best character on TV, and this child thinks that [different character] is the best character on TV.

This child thinks that [participant's favorite color] is the prettiest color, and this child thinks that [different color] is the prettiest color.

This child thinks that [participant's favorite game] is the most fun game to play, and this child thinks that [different game] is the most fun game to play.

## FACTUAL ITEMS

This child thinks that the Brachiosaurus was the biggest dinosaur, and this child thinks that the Ceratosaurus was the biggest dinosaur.

This child thinks that the Nile is the longest river in the world, and this child thinks that the Amazon is the longest river in the world.

This child thinks that McDonald's makes the most popular hamburger, and this child thinks that Burger King makes the most popular hamburger.

This child thinks that most people who have green eyes are girls, and this child thinks that most people who have green eyes are boys.

**APPENDIX B: EXPERIMENT 2 STIMULI**

Note: The items below are structured for participants who responded affirmatively to all yes-or-no questions. Only the description of one character in each pair is provided; the second character was portrayed as the opposite of the first character (see first item for an example).

## RELIGION ITEMS

This child reads holy books about God, but (s)he does not think that God knows all of our thoughts. This [other] child thinks that God knows all of our thoughts, but (s)he does not read holy books about God.

This child celebrates God with other people, but (s)he does not think that there is only one God.

This child thinks that God hears the songs that people sing to Him, but (s)he does not tell other people that there is only one God.

This child thinks that God wants to be celebrated by all people, but (s)he does not celebrate holidays in places where people go to pray.

## OPINION ITEMS

This child thinks that [child's favorite TV character] is the best TV character, but (s)he does not read [child's favorite book] for fun. (Second character: This child reads [child's favorite book] for fun, but (s)he does not think that [child's favorite TV character] is the best TV character.)

This child eats [child's favorite fruit] for a snack, but (s)he does not think that [child's favorite song] is the best song.

This child thinks that [child's favorite color] is the prettiest color, but (s)he does not eat [child's favorite dessert] after dinner.

This child wears clothes that are [child's favorite color], but (s)he does not think that [child's favorite TV show] is the best TV show.

## CONVENTION ITEMS

This child goes to school in the fall, but (s)he does not think that eating dinner every evening is healthy.

This child thinks that it is important to get enough sleep, but (s)he does not close his/her eyes while sleeping.

This child thinks that sleeping on a pillow is comfortable, but (s)he does not give his/her friends gifts on their birthday.

This child puts his/her head on a pillow while sleeping, but (s)he does not think that brushing your teeth every day keeps them healthy.