

In the name of God: How children and adults judge agents who act for religious versus secular reasons



Larisa Heiphetz^{a,*}, Elizabeth S. Spelke^b, Liane L. Young^a

^aBoston College, 140 Commonwealth Ave., Chestnut Hill, MA 02467, United States

^bHarvard University, 33 Kirkland St., Cambridge, MA 02138, United States

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ABSTRACT

Many people are guided by religious beliefs, but judgments of religiously and secularly motivated individuals remain unclear. We investigated reasoning about religiously versus secularly motivated characters among 5- to 10-year-olds and adults. In Study 1, theist and non-theist children reported similar attitudes toward theists; however, large differences emerged between theist and non-theist adults. Study 2 obtained similar results using a continuous, rather than forced choice, measure of preference. Additionally, Studies 2–3 tested two explanations for the stronger influence of religious background on adults' versus children's responses. Study 2 did not find strong evidence for the *theistic majority* account, which posits that the greater perceived prevalence of theists as compared with non-theists influenced children's responses more than adults' responses. The results of Study 3 were consistent with the *intuition* account, which argues that non-theist adults had effortfully overridden the teleological intuitions that may have influenced children's responses in Studies 1–2 and potentially led children to prefer characters whose beliefs were in line with children's own intuitions. The degree to which teleological intuitions persisted implicitly among adults predicted those adults' pro-theist preferences. These findings offer connections between religious judgments and other areas of social cognition, such as social preferences and teleology.

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1. Introduction

Religious beliefs are potent drivers of behavior, influencing everything from voting (Denton, 2005; Lockerbie, 2013; Morgan, Skitka, & Wisneski, 2010) to health-related behaviors such as use of alcohol and other drugs (Horton, Ellison, Loukas, Downey, & Barrett, 2012; Kendler et al., 2003) to prejudice against minority groups (Tsang & Rowatt, 2007). Religious beliefs and identities can lead to *pro-social* behaviors such as fairness (Norenzayan & Shariff, 2008; Shariff & Norenzayan, 2007, 2011) as well as to *anti-social* behaviors such as violent conflict (Ginges, Hansen, & Norenzayan, 2009; Pew Research Center, 2014).

Like the evidence concerning the relationship between religiosity and pro-social as well as anti-social behaviors, data concerning people's evaluations of individuals who act for religious versus secular reasons are also mixed. On the one hand, the majority of Americans report that it is necessary to believe in God in order

to be moral (Pew Research Center, 2008), suggesting that individuals who do not act for religious reasons may be perceived as especially immoral. Indeed, both theist and non-theist American adults readily associate atheists with moral transgressions (Gervais, 2014a; Gervais, Shariff, & Norenzayan, 2011). On the other hand, recent experiments (Gervais, 2014b) suggest that religious motivations decrease the perceived morality of behaviors. Both theist and non-theist American adults rated charitable donations as less moral when these behaviors were preceded by the donor's consideration of his religious beliefs (e.g., asking himself what Jesus would do) compared to when they were preceded by the donor's consideration of his secular beliefs or an unspecified topic. Gervais (2014b) argued that when pro-social behaviors were religiously motivated, participants inferred that the positive outcome was a side effect rather than the intended goal and therefore perceived religiously motivated actors as less responsible for their morally good behaviors.

Seeking to clarify the relationship between religious beliefs and moral cognition, the current work investigated the relationship between development, religious background, and evaluations of religiously versus secularly motivated behaviors. Specifically, a religious *belief* (e.g., "God exists") may give rise to a religious

* Corresponding author at: Department of Psychology, Boston College, 326I McQuinn Hall, 140 Commonwealth Ave., Chestnut Hill, MA 02467, United States.

E-mail addresses: larisa.heiphetz@bc.edu (L. Heiphetz), spelke@wjh.harvard.edu (E.S. Spelke), liane.young@bc.edu (L.L. Young).

motivation if it serves to influence behavior (e.g., “It is important to treat others kindly because that is what God wants”). The current work presented participants with characters whose motives were explicitly religious and characters whose motives did not explicitly mention religion (for brevity, such motivations will be referred to as “secular motivations”). Evaluations of actors are intimately connected with evaluations of their behaviors; people typically judge individuals whose behaviors are perceived in a positive light more favorably than individuals whose behaviors are perceived in a negative light (Baron, Dunham, Banaji, & Carey, 2014; Hamlin, Wynn, & Bloom, 2007). Thus, in Study 1, 5- to 10-year-old children and adults judged both the behaviors themselves (e.g., by indicating whether the religiously motivated or secularly motivated behavior was better) and the characters who performed those behaviors (e.g., by indicating how much they liked the religiously and secularly motivated characters). The purpose of Study 2 was to investigate whether the fact that most people are theists influenced participants’ responses; thus, children and adults were led to believe either that theist beliefs or non-theist beliefs were prevalent. Participants then indicated how much they liked religiously and secularly motivated characters. The purpose of Study 3 was to further probe adults’ cognition. In this final study, adults indicated how much they liked religiously and secularly motivated characters, as in Study 2, and also completed measures of intuitive teleology and implicit preference (see below).

1.1. The development of social preferences

Early in development, children show preferences based on a number of dimensions. One of the earliest emerging forms of preference is for the familiar rather than the unfamiliar. Infants and toddlers avoid strangers, seeking instead to connect with familiar individuals such as their parents (Bowlby, 1988; Brooker et al., 2013). Children also show preferences based on a number of social categories, including race and ethnicity (Aboud, 1988; Baron & Banaji, 2006), gender (Graham & Cohen, 1997; Hoffmann & Powlishta, 2001), language/accent (Kinzler, Shutts, DeJesus, & Spelke, 2009), and socio-economic status (Horwitz, Shutts, & Olson, 2014).

In addition to these categories, children readily divide people into groups based on religious identity, and the roots of religious bias lie early in development. Secular Jewish 5-year-olds in Israel drew inferences about others based on their religious affiliation (Diesendruck & HaLevi, 2006), and American 6-year-olds from a variety of religious backgrounds preferred individuals who shared their religious beliefs and identities (Heiphetz, Spelke, & Banaji, 2013, 2014). Unlike other social groups, such as race and caste, religious groups appear to insulate minority group members against in-group derogation. In one line of work, Muslim third through eleventh graders in India, who are a religious minority group in their country, preferred Muslims over Hindus (the dominant religious group in India). In contrast, participants from both high-caste and low-caste groups, as well as participants who fell outside the caste system, all preferred high-caste individuals (Dunham, Srinivasan, Dotsch, & Barner, 2014).

In addition to preferring religious in-group members, 6- to 11-year-old American children from a variety of religious backgrounds also selectively attributed moral behaviors (e.g., helping others) to peers who shared their religious beliefs but not to those who shared their beliefs concerning facts, opinions, or culturally normative behaviors (Heiphetz et al., 2014). This finding indicates a unique link between religious beliefs and moral behaviors and suggests that children may also prefer characters who perform religiously motivated behaviors, a possibility that the present experiments tested directly.

1.2. The relationship between children’s and adults’ religious cognition

The research described above indicates that children show religion-based social preferences. What is the relationship between children’s and adults’ religious cognition? One possibility is that adults’ judgments reflect early-emerging responses to others’ motivations. If the influence of religious versus secular motivations on individuals’ social judgments develops early and remains relatively immune to social influence (e.g., interactions with religious out-group members, attendance at worship services), adults and children should respond similarly to each other. Another possibility is that adults’ responses depend on prolonged social learning concerning religious views and religious out-group members. In this case, strong differences would be expected to emerge between theist and non-theist adults, who have had years of exposure to differing in-groups. Although even young children may have some exposure to religious ideas, by virtue of being far younger than adult participants, children also have far less social experience than do adults. Therefore, children may place less emphasis on religious versus secular motivation when evaluating behaviors, leading to weaker differences between children from theistic and non-theistic backgrounds (subsequently referred to as “theist children” and “non-theist children,” respectively, for brevity).

If adults’ responses differ from those of children, two different forms of social learning could account for these differences. First, the *theistic majority* account posits that children and adults may be influenced differently by the perceived prevalence of theists. Even infants are sensitive to whether physical objects are in the majority or the minority (Denison, Reed, & Xu, 2013), and children are sensitive to their own majority or minority group status. For example, models of ethnic identity development (see Chavez & Guido-DiBrito, 1999, for a review) often describe how minority group children manage the knowledge that they are minorities, and gender non-conforming children are aware that they are different from most other children (Beemyn & Rankin, 2011). Of most relevance to the current project, children in prior qualitative work have responded that most people believe in God (e.g., Nye, 2006).

Majority influence—the influence of individuals who hold prevalent viewpoints—could lead individuals to reason that religious motivations are better than secular motivations because religious ideas may be perceived as more prevalent than secular ideas and appear to influence more people.¹ Individuals whose viewpoints are shared by the majority are not only influential but can also be evaluated more positively than individuals who hold minority beliefs (Gardikiotis, Martin, & Hewstone, 2004; Mucchi-Faina, Pacilli, & Pagliaro, 2011; Seyranian, Atuel, & Crano, 2008). Thus, children may evaluate people who hold theistic worldviews more positively than people who do not appear to hold such views. Reasoning guided by considerations of whether a particular belief is the majority viewpoint may seem less compelling to older non-theists, perhaps because they are guided more by their own independent evaluations of the motivations themselves rather than considerations of numerical majority. While children and adults are both susceptible to majority influence under some circumstances (Harris, 2012; Haun, van Leeuwen, & Edelson, 2013), adults have also devel-

¹ One could argue that religious motivations are less prevalent than secular motivations because theists are influenced both by religious motivations and by secular motivations, whereas non-theists are only influenced by secular motivations. However, for theists, secular motivations may be imbued with religious overtones (e.g., religious children may want to make their parents happy because they believe that is what God wants them to do). Furthermore, the current research specifically contrasted motivations (children learned about characters who performed behaviors to make God happy immediately before or after learning about characters who performed behaviors to make their parents happy), perhaps leading to the inference that characters who performed their behaviors to make their parents happy were not religious (see Grice, 1975).

oped strategies that allow them to resist such influence. For example, strong moral bases for one's attitudes (Aramovich, Lytle, & Skitka, 2012; Hornsey, Majkut, Terry, & McKimmie, 2003) and exposure to minority views (Martin, Hewstone, & Martin, 2008) allow adults to resist the influence of majority views.

Second, the *intuition* account argues that, on an explicit level, adults have learned to override intuitions and implicit attitudes that may guide children's responses. We use the word *intuition* to refer to aspects of cognition that are cognitively natural and effortless (Kelemen, 2004) and the word *implicit* to refer to aspects of cognition that participants are unable (due to lack of self-knowledge) or unwilling (due to social desirability concerns) to report (Dasgupta, 2009). To the extent that intuitions persist on an implicit level, they are expected to predict pro-theist preferences. Thus, the intuition account references conscious processes (e.g., reporting one's preferences) that could be influenced by unconscious phenomena (e.g., teleological intuitions). The intuition account also highlights the role explicit processes can play in over-riding intuitions and implicit attitudes.

Some prior work conducted among elementary school children from diverse religious communities in Western countries (e.g., Bloom, 2007; Evans, 2001; Kelemen, 2004; Poling & Evans, 2002) has argued that young children may find explanations involving purpose-based creation—i.e., teleological explanations (e.g., “pre-historic rocks were pointy so that animals wouldn't sit on them and smash them”)—more compelling than physical explanations (e.g., “pre-historic rocks were pointy because bits of stuff piled up for a long period of time”). In the current work, references to “teleological intuitions” refer to these kinds of explanations of natural phenomena rather than explanations of behaviors (e.g., the statement that a character performed a behavior to please God). Although teleological explanations need not involve supernatural agents directly and are therefore distinct from theism, such explanations may nevertheless be *associated* with theistic views. The ability to attribute goals to agents emerges early in development (Woodward, 1998) and, lacking relevant scientific knowledge, children may assume that natural phenomena were created by an intentional agent (i.e., God) to serve a particular purpose (Kelemen, 2004). For example, if one starts with the assumption that pre-historic rocks were pointy so that animals would not sit on them, it is reasonable to then infer that an agent created the rocks to be this way. Thus, a teleological belief (about why rocks are a particular way) may be linked with a theistic belief (about who created rocks in that way). Although teleological and theistic beliefs are distinct, due to their association with each other, both may be compelling to young children.

If children's intuitions favor teleological explanations that imply an agent, children may also favor individuals whose motivations match these intuitions. Prior work has shown that children prefer individuals who act in accordance with the child's own attitudes and beliefs. For example, in prior studies, infants preferred characters who were similar to themselves (Mahajan & Wynn, 2012) and also preferred individuals who behaved kindly toward characters who were similar to participants and meanly toward characters who were dissimilar to participants (Hamlin, Mahajan, Liberman, & Wynn, 2013). Because children prefer individuals who act in accordance with the children's beliefs, and because children may find theistic beliefs compelling, they may also like individuals whose behaviors stem from religious beliefs.

The intuition account does not require explicit knowledge or reasoning among children (for other work showing that early intuitions are distinct from explicit reasoning, see Kellman & Spelke, 1983; Onishi & Baillargeon, 2005; Wynn, 1992). Rather, the intuition account posits that perceptions of theists and non-theists are driven by the extent to which participants hold teleological intuitions. Within the intuition framework, non-theists eventually

override these initial intuitions on an explicit level, although the intuitions persist to various degrees on an implicit level. This over-riding may be influenced by experiences such as learning and coming to believe scientific claims that reject purpose-based creation. This process is akin to other forms of over-riding; for example, White children and White adults may harbor pro-White attitudes, but exposure to egalitarian social norms may have helped White adults learn to over-ride these implicit attitudes on an explicit level (e.g., Baron & Banaji, 2006). Unlike non-theists, theists may continue endorsing their early intuitions even in adulthood. Indeed, due to their exposure to teleological accounts (e.g., sermons about purpose-driven creation), adults theists may have spent time considering teleological explanations, may have developed elaborate teleological accounts of their own (e.g., applying teleological explanations to their own lives, Banerjee & Bloom, 2014b), and may strongly endorse teleological claims.

Prior work consistent with this account has shown that children readily report that natural phenomena were created for a purpose (Evans, 2001; Kelemen, 2004). Meanwhile, adults reject purpose-based explanations when they are able to deliberate on their responses but accept such explanations when placed under time pressure (Kelemen & Rosset, 2009; Kelemen, Rottman, & Seston, 2013). Kelemen et al. (2013; Kelemen & Rosset, 2009) interpreted the difference between adults' slow and speeded responses as an indication that intuitions present in childhood persist even in adulthood. Adults could explicitly override these intuitions when they had plenty of time to consider their responses, but the early intuitions emerged under speeded conditions. Similar disjunctions between adults' speeded and un-speeded responses have emerged in other domains, such as gender essentialism (adults reported less essentialism than was evident in their speeded responses, Eidson & Coley, 2014) and racial attitudes (adults reported more egalitarian attitudes than was evident in their speeded responses, Nosek et al., 2007). In line with this prior work, the intuition account predicts greater differences between theist and non-theist adults on un-speeded versus speeded tasks.

1.3. Overview of current research

The current work investigated the influence of development and religious background on individuals' reasoning about religiously and secularly motivated characters and their behaviors. The current research included three types of behaviors (pro-social behaviors performed toward people *familiar* to the character, pro-social behaviors performed toward people *unfamiliar* to the character, and *neutral* behaviors) to determine the extent to which participants' judgments generalized across behaviors. We reasoned that because American children spend most of their time with people they know (Hofferth & Sandberg, 2001), the majority of their pro-social behaviors may be targeted toward these individuals, and we wanted to elicit judgments about behaviors that would seem relatively common and familiar to participants. Because several religious traditions teach the importance of kindness to strangers, we also tested pro-social behaviors performed toward people unfamiliar to the character. Finally, to determine whether the results generalized beyond pro-social behaviors, we tested neutral behaviors.

In Study 1, we investigated the extent to which age and religious background influenced participants' evaluations of religiously and secularly motivated characters. To manipulate perceptions of motivations, we told children about characters who performed their behaviors to make God happy (religious motivation) or to make their parents happy (secular motivation). The religious motivation explicitly referenced God because many religious traditions are theistic; therefore, a character motivated to please God would seem like an in-group member to children

from a variety of religious backgrounds (e.g., Protestantism, Catholicism, Judaism). The secular motivation referenced parents because they, like God, can be perceived as an important authority figure in children's lives (for work on children's similar reasoning about parents and God, see Coles, 1991; Dickie et al., 1997).

Studies 2–3 tested two accounts to explain participants' judgments of religiously and secularly motivated characters. Study 2 tested the theistic majority account by manipulating participants' perceptions of the prevalence of theists. If perceptions of the prevalence of theists influenced participants' responses, participants who were led to believe that theist viewpoints are prevalent would have reported more positive attitudes toward theists than participants who were led to believe that non-theist viewpoints are prevalent. Study 3 tested the intuition account by investigating the relationship between intuitive teleology and implicit and explicit attitudes toward religious individuals. Prior work (Kelemen & DiYanni, 2005) has shown that theist and non-theist children readily express their teleological intuitions; it is only in adulthood that differences between theist and non-theist adults are expected to emerge, and these differences are expected to be greater on unsped rather than speeded tasks. For these reasons, Study 3 tested only adults.

2. Study 1

The purpose of Study 1 was to elicit children's and adults' reasoning about religiously and secularly motivated behaviors and the characters who performed them. Five-year-olds were the youngest children tested because previous work has shown that children of this age can reason coherently about others' religious beliefs (Heiphetz, Spelke, Harris, & Banaji, 2013), and we employed a relatively broad age range to test for potential developmental change or consistency. Additionally, we tested a number of behaviors to investigate the extent to which reasoning generalized across different behavior types.

2.1. Method

2.1.1. Participants

The child sample included participants (134 girls and 135 boys) between the ages of 5 and 10 years ($M_{\text{age}} = 7.28$ years, $SD_{\text{age}} = 1.80$ years; $N_{5- \text{ to } 6\text{-year-olds}} = 103$, $N_{7- \text{ to } 8\text{-year-olds}} = 88$, $N_{9- \text{ to } 10\text{-year-olds}} = 78$). We recruited children via a departmental database as well as in a children's museum in the northeastern United States. In the former case, a researcher called families, explained that we were interested in learning how children thought about identical behaviors that were motivated by different reasons (including religious reasons), and asked if parents would be interested in bringing their child to the lab to participate. In the latter case, researchers approached adults visiting the museum with their children, described the study in the same way, and asked if the family would be interested in participating. In both cases, children received a sticker or small toy for their participation. In many cases we did not know the participants' religious affiliation until after they had completed the study. Because the majority of children in the region where data were collected were religiously affiliated, in this and all subsequent studies we collected data from more theist children than necessary in order to obtain a reasonable non-theist sample size.

On a demographic questionnaire completed during the session, parents identified their child's race as White (68%), Black (2%), Asian (9%), Hispanic (4%), Native American (.4%), and "other" (14%); the remaining parents did not identify their child's race. On the same questionnaire, parents identified their child's religious affiliation as Protestant (12%), Catholic (26%), other Christian

denomination (12%), Jewish (7%), Muslim (1%), atheist or agnostic (18%), or "other" (17%); the remaining parents did not identify their child's religion. Parents who responded "other" were given the opportunity to provide more information. If parents wrote a religious affiliation (e.g., "Mormon"), their children were included in the theist group. If parents indicated no religious affiliation (e.g., "none"), their children were grouped with atheist and agnostic participants, for a total sample that was 26% non-theist ($N_s = 29$ 5- to 6-year-olds, 21 7- to 8-year-olds, and 20 9- to 10-year-olds). In addition to selecting their child's religious affiliation, parents who participated in the lab were asked how often their child attended services at a place of worship on a scale from 0 ("never") to 5 ("every week or more often"); we were asked not to include this question in the demographic form used at the museum. Parents of children who participated in our lab ($N = 182$) indicated that, on average, their children attended services "a few times a year" ($M = 2.66$, $SD = 2.00$).

The adult sample included participants (36 women, 18 men, 2 participants who identified as "transgender/other," and 1 participant who did not identify his/her gender) between the ages of 18 and 70 years ($M_{\text{age}} = 25.59$ years, $SD_{\text{age}} = 11.91$ years). We recruited adults via a departmental subject pool that included both students and non-student community members. Adults completed the study online for a chance to win a \$25 gift certificate. On a demographic questionnaire completed at the end of the session, participants identified their race as White (68%), Asian (16%), Hispanic (5%), and "other" (9%). On the same questionnaire, participants identified their religious affiliation as Protestant (12%), Catholic (18%), other Christian denomination (7%), Jewish (9%), Muslim (4%), atheist or agnostic (40%), and "other" (11%). One additional participant did not identify his/her race and religious affiliation. None of the adults who selected "other" self-identified as non-theists. All adults were asked how often they attended services at a place of worship. On average, participants reported attending services "once a year" ($M = 1.80$, $SD = 1.81$). Adult participants (but not parents of child participants) were also asked how much education they had completed using a scale from 1 ("some high school") to 8 ("PhD or other post-graduate degree"). On average, they reported completing some college ($M = 3.38$, $SD = 1.21$).

2.1.2. Procedure

At the beginning of the session (here and in Study 2), the experimenter told children that she would tell them about some other people and ask them some questions. Children viewed Power Point displays of pairs of characters who were the same race, gender, attractiveness, and approximate age (as measured by an adult pre-test) as each other; characters were represented by publically accessible photographs of children. On each trial, the experimenter attributed an identical behavior but differing motivation to each character. For example, on one trial, the experimenter said, "This person [pointing to the character on the left] helped his/her friends make an art project for school because he/she thought that would make his/her parents happy. This person [pointing to the character on the right] helped his/her friends make an art project for school because he/she thought that would make God happy." One character always performed the behavior to please his/her parents (secular motivation), and the other character always performed the behavior to please God (religious motivation). We chose pleasing parents as the secular motivation because parents, like God, are an important authority figure and generally play an important role in many individuals' lives.

After introducing the characters, the experimenter asked, "Which person's behavior was better?" (the *behavior preference* question) and, "Which person do you like more?" (the *liking* question). Participants' responses were coded as 0 if they selected the secularly motivated character and 1 if they selected the religiously

motivated character. After children responded by pointing to one of the characters, the experimenter moved on to the next trial. Four trials included pro-social behaviors toward a familiar person, as in the example above; four trials included pro-social behaviors toward an unfamiliar person (e.g., “This person helped someone he/she didn’t know do homework”); and four trials included neutral behaviors (e.g., “This person watched his/her teacher help another student do math problems”). Each behavior was immediately followed by a motivation (“...because he/she thought that would make God [or his/her parents] happy”). Behaviors were adapted from Dunham, Baron, and Carey (2011) and modified to increase domain matches across categories (e.g., in the example above, each category included a school-related behavior; for all items, see Appendix A). The following aspects of the experimental design were counterbalanced across participants: question order, the behavior and motivation attributed to each character, the side of the screen on which each photograph appeared, the side of the screen paired with the religious motivation, and the order in which the two dependent measures were asked, with the exception that this order stayed constant for any given child across trials.

Adults completed the same procedure via a self-paced online task, with two notable changes. First, they read the materials silently to themselves. Second, the purpose of showing photographs to children was to draw children’s attention to the study; because adults do not require such manipulations to keep their attention, they did not view photographs of the characters.²

2.2. Results

We analyzed the percentage of trials on which participants selected the religiously motivated character using a 4 (Participant Age: 5- to 6-year-old vs. 7- to 8-year-old vs. 9- to 10-year-old vs. adult) \times 2 (Participant Religion: theist vs. non-theist) \times 3 (Behavior Type: pro-social toward familiar person vs. pro-social toward unfamiliar person vs. neutral) \times 2 (Dependent Measure: behavior preference vs. liking) mixed-model ANOVA with repeated measures on the last two factors.³ We compared all theists with

² To ensure that children’s responses were not driven by the particular photographs with which each belief was paired, we conducted a one-way ANOVA using data from child participants only and entering the version of the study they completed as the predictor variable. The same photographs were paired with different beliefs across multiple versions of the study (Study 1 included eight versions, and Study 2 included three versions). Version did not influence children’s responses to any of the dependent measures in either Study 1 or Study 2, supporting the idea that children’s responses were influenced by the behaviors and motivations attributed to each character rather than the photographs. Because photographs did not influence children’s responses, this also suggests that any differences between children and adults were unlikely to result from the fact that children viewed photographs while adults did not.

³ We analyzed the data this way because calculating a percentage across multiple trials yields a continuous measure and because simulations have shown that it is appropriate to use ANOVA to analyze percentages under many conditions (Lunney, 1970; Rosenthal & Rosnow, 1984), including those similar to the current experiment (i.e., non-extreme proportions and sufficient degrees of freedom). In cases where the assumption of homogeneity of variance (sphericity) was not satisfied, we analyzed data using a Greenhouse-Geisser correction. However, in addition to conducting the analyses described in the main text, we also analyzed data from Study 1 using a binary logistic regression model. In this analysis, we modeled all possible main effects (Participant Age, Participant Religion, Behavior Type, and Dependent Measure) and all possible two-way, three-way, and four-way interactions as fixed effects. As in the analyses reported in the main text, we found three main effects: Participant Age ($F(3, 1708) = 12.83, p < .001$), Participant Religion ($F(1, 1708) = 158.89, p < .001$), and Behavior Type ($F(2, 1708) = 20.53, p < .001$). Similarly to the analyses reported in the main text, these effects were qualified by two interactions: Participant Age \times Participant Religion ($F(3, 1708) = 18.07, p < .001$) and Participant Age \times Behavior Type ($F(6, 1708) = 2.92, p = .01$). No other main effects or interactions reached significance ($ps \geq .137$). The only difference between this analysis and the ANOVA reported in the main text is that in this analysis, the Participant Religion \times Behavior Type interaction did not reach significance ($p = .14$). This interaction is not central to the main argument and should be interpreted with caution.

non-theists because members of all of the religions represented in our sample could be motivated to make God happy, a motivation that does not apply to non-theist participants. Therefore, the religiously motivated character was more similar to the group of theist participants as a whole than to the group of non-theist participants. For further discussion of potential differences between religious groups, see General Discussion.

The omnibus ANOVA revealed three main effects. First, we found a main effect of Participant Age ($F(3, 284) = 3.95, p = .01$, partial $\eta^2 = .04$). The youngest participants were most likely to select the religious character, and the proportion of trials on which this character was chosen decreased for every subsequent age group. Bonferroni-corrected pairwise analyses (used for this and all other analyses in Studies 1–3 examining main effects and simple effects following interactions) showed that only the difference between 5- to 6-year-olds and adults reached significance ($p = .01$, other $ps \geq .09$). Second, we found a main effect of Participant Religion ($F(1, 284) = 55.64, p < .001$, partial $\eta^2 = .16$). Theists were more likely than non-theists to select the religious character ($p < .001$). Third, we found a main effect of Behavior Type ($F(1.95, 552.94) = 29.63, p < .001$, partial $\eta^2 = .09$). Participants were more likely to select the religious character when judging characters who performed pro-social behaviors toward unfamiliar people than familiar people or characters who performed neutral behaviors ($ps < .001$); the latter two categories did not differ from each other ($p = .21$). The main effect of Dependent Measure did not reach significance ($p = .35$); therefore, subsequent simple effects tests collapsed across this variable.

The three main effects were qualified by three interactions: Participant Age \times Behavior Type ($F(5.84, 552.94) = 4.05, p = .001$, partial $\eta^2 = .04$), Participant Religion \times Behavior Type ($F(1.95, 552.94) = 4.08, p = .02$, partial $\eta^2 = .01$), and Participant Age \times Participant Religion ($F(3, 284) = 5.63, p = .001$, partial $\eta^2 = .06$). Because Studies 2–3 further investigated the last interaction, we present the simple effects only for this interaction below; the remaining simple effects can be found in [Supplementary Materials](#).

Age appeared to exert a stronger influence on the responses of non-theists rather than theists. Among non-theists, adults were less likely to select the religiously motivated character than were 5- to 6-year-olds ($p < .001$) and 7- to 8-year-olds ($p = .01$); adults did not differ from 9- to 10-year-olds ($p = .21$). No age differences emerged among theists ($ps = 1.00$). The difference between non-theists and theists reached significance in every age group other than the youngest (5- to 6-year-olds: $p = .12$; 7- to 8-year-olds: $p = .01$; other age groups: $ps < .001$). That is, religious background did not influence the responses of the youngest children in our sample. However, we observed a strong influence of religious background by adulthood (Fig. 1). No other main effects or interactions reached significance.

To further explore the responses of theists and non-theists of different ages, we compared the responses of each group to chance. Eight one-sample *t*-tests compared the proportion of trials on which theists and non-theists in each age group selected the religiously motivated character. Because the main goal of this analysis was to examine the relationship between religious background and age, we collapsed across Behavior Type and Dependent Measure. After applying a Bonferroni correction, only the responses of non-theist adults remained significantly different from chance ($t(21) = -6.03, p < .001$). Indeed, by adulthood, non-theists’ pro-secular preferences were far stronger than theists’ pro-theist preferences (Cohen’s $ds = -1.28$ vs. $.24$, respectively). This effect occurred despite the fact that the youngest non-theist children in our sample were statistically indistinguishable from their theist peers.

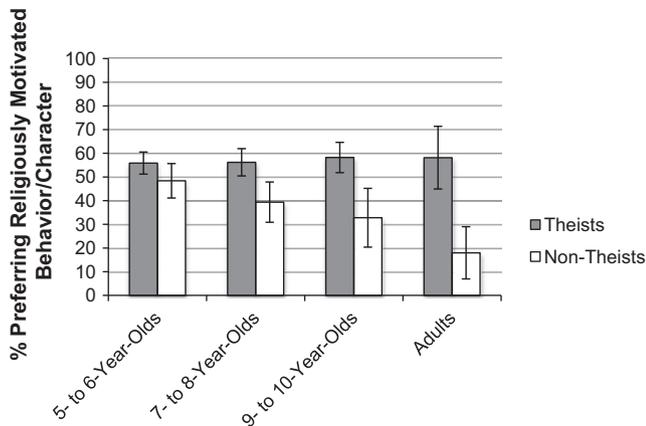


Fig. 1. Percentage of participants who selected the religiously motivated character averaged across behavior type as well as behavior preference trials (“Which person’s behavior was better?”) and liking trials (“Which person do you like more?”), Study 1. Error bars represent 95% confidence intervals.

2.3. Discussion

The main purpose of Study 1 was to investigate the influences of age and religious background on individuals’ preferences for people performing religiously versus secularly motivated behaviors. The main finding showed that age exerted a stronger influence on the responses of non-theists as compared with theists. Specifically, with age, non-theists became increasingly likely to prefer secularly motivated characters and their behaviors, despite the fact that the two characters performed identical behaviors. However, theists did not show age-related changes.

The finding that religious background influenced adults’ responses—indeed, that the effect size for this effect was moderately large—differs from the results reported by Gervais (2014b) showing that both theists and non-theists discounted pro-social behaviors performed for religious reasons. One explanation for these divergent results is the form of the question. Whereas the participants in Gervais (2014b) research were faced with characters who considered religious values in general, the participants in the present work learned about characters who performed their behaviors because they thought the behaviors would make God happy. We used this version of the question because it was simple enough for 5-year-olds to understand and because seeking to please God is a relatively common motivation among religious individuals (Coles, 1991; Luhrmann, 2012). Theists could perceive this motivation especially positively because of positive associations with striving to increase happiness as well as positive associations with God. However, non-theists could perceive this motivation especially negatively if they associate the motivation to make God happy with harmful behaviors (e.g., committing violence against abortion providers) or if they perceive religious motivations to be especially driven by selfish concerns (e.g., the desire to go to heaven rather than the desire to help another person). These possibilities concerning the differences between our findings and those reported by Gervais (2014b) remain open for testing in future research.

3. Study 2

The purpose of Study 2 was three-fold. First, Study 2 was designed to clarify a puzzling aspect of the results from Study 1—namely, that we did not find stronger pro-theist preferences. One possibility is that most participants viewed both motivations (pleasing God and parents) in a positive light. Thus, the lack of a

strong pro-theist preference may indicate strong liking for both characters and their behaviors rather than a weak liking for either. To test this account, Study 2 employed a separate continuous scale for each character, which allowed participants to report that they strongly liked or disliked both religiously and secularly motivated characters.

Second, to increase the generalizability of Study 1’s results to a larger number of motivations, Study 2 expanded the motivations tested. In addition to evaluating characters who performed their behaviors to make God happy and characters who performed their behaviors to make their parents happy, participants evaluated characters who performed their behaviors to make themselves happy—a relatively common motivation in Western cultures (cf. Markus & Kitayama, 1991; Morling & Kitayama, 2008).

Third, Study 2 tested the theistic majority account, which posits that the youngest children in our sample were particularly sensitive to the greater prevalence of theists as compared with non-theists. The responses of both theist and non-theist children may have been more influenced by the perceived prevalence of theists than were the responses of adults, who may have been able to resist majority influence to a greater degree than did children. To test this prediction, half of the participants were told that many people believe in God while the other half were told that many people do *not* believe in God.

3.1. Method

3.1.1. Participants

The child sample included participants (93 girls, 91 boys, and 1 participant of unspecified gender) between the ages of 5 and 10 years old ($M_{age} = 7.52$ years, $SD_{age} = 1.82$ years; $N_{5- to 6-year-olds} = 62$, $N_{7- to 8-year-olds} = 53$, $N_{9- to 10-year-olds} = 70$). One additional child began the study but refused to answer questions. Recruitment and compensation were identical to Study 1. On a demographic questionnaire completed during the session, parents identified their child’s race as White (65%), Black (2%), Asian (13%), Native American (1%), and “other” (16%); the remaining parents did not identify their child’s race. We asked about ethnicity separately from race, and 8% of children were identified as Hispanic or Latino. On the same questionnaire, parents identified their child’s religious affiliation as Protestant (12%), Catholic (22%), other Christian denomination (9%), Jewish (5%), Muslim (1%), atheist or agnostic (26%), or “other” (24%). Children whose parents selected “other” and wrote responses that indicated no religious affiliation (e.g., “none”) were grouped with children identified as atheist or agnostic, for a total sample that was 44% non-theist ($Ns = 32$ 5- to 6-year-olds, 21 7- to 8-year-olds, and 29 9- to 10- year-olds). All parents were asked how often their child attended services at a place of worship and, on average, reported attendance “once a year” ($M = 2.03$, $SD = 2.05$).

The adult sample included participants (64 women, 53 men, and 1 participant who identified as genderqueer) between the ages of 19 and 73 years ($M_{age} = 35.06$ years, $SD_{age} = 11.51$ years). Data from four additional adults were not analyzed because they failed to correctly answer an attention check question. Participants were recruited online via Amazon Mechanical Turk and received \$0.75. All participants were residents of the United States. On a demographic questionnaire completed at the end of the session, participants identified their race as White (81%), Black (8%), Asian (4%), Native American (3%), and “other” (3%). Additionally, 8% of participants identified as Hispanic or Latino. On the same questionnaire, participants identified their religious affiliation as Protestant (18%), Catholic (14%), other Christian denomination (12%), atheist or agnostic (43%), and “other” (14%). Adults who selected “other” and wrote in answers indicating a lack of religious affiliation (e.g., “none”) were grouped with atheists and agnostics, for a total

sample that was 48% non-theist. On average, participants reported attending services at a place of worship “less than once a year” ($M = 1.31$, $SD = 1.72$) and completing a 2 year college degree ($M = 4.09$, $SD = 1.53$).

3.1.2. Procedure

In Part I, the prime, children heard the experimenter read a brief paragraph intended to manipulate their perceptions of the prevalence of theism. Approximately half ($N = 90$) of the children heard a paragraph stating that many people believe in God, while the remaining participants heard a paragraph stating that many people do *not* hold this belief (Appendix B). We did not believe that it was ethical to lie to children by explicitly telling them that most people in the world were either theists or non-theists. However, immediately after reading this paragraph, the experimenter asked, “So, do most people think that God is real or not real?” The majority of children inferred an answer consistent with the prime (see “Results,” below).

The experimenter then trained children on how to use a four-point scale to answer questions about liking, indicating that children should point to a face with a big frown if they “don’t like the person at all,” a face with a small frown if they “don’t like the person a little bit,” a face with a small smile if they “like the person a little bit,” and a face with a big smile if they “like the person a whole lot.” The experimenter then asked, “Does that make sense? So, if I asked you how much you like ice cream, which face would you point to? And if I asked you how much you liked broccoli, which face would you point to?” Children generally answered positively to the first practice question and negatively to the second practice question. Children did not appear to experience difficulty using the scale.

Because results for the behavior preference question and the results for the liking question in Study 1 were similar, we used only the liking question in Study 2. This approach allowed extra time during the session to include the prime and a self-oriented motivation. We selected the liking question to allow us to compare our results with prior work on children’s social preferences.

In Part II, children viewed photographs of one character at a time on a Power Point display. Photographs were similar to those used in Study 1. After showing each picture, the experimenter attributed a behavior and a motivation to the person, asked participants how much they liked him or her, and recorded the scale point to which children pointed. Behaviors were identical to those used in Study 1, and each behavior was paired with each motivation, for a total of 36 items. Question order and the behavior and motivation attributed to each character were counterbalanced across participants.

Adults (62 in the *many theists* condition and 56 in the *many non-theists* condition) completed the same procedure, with three notable changes. First, they read the materials silently to themselves. Second, they did not view photographs of the characters. Third, they used scales with verbal labels for each point rather than scales with pictures of faces and did not receive training on how to use this scale.

3.2. Results

Four binomial tests showed that participants in each age group were more likely than chance to provide the correct answer to the manipulation check question (saying that most people think that God is real in the “many theists” condition and that most people think that God is not real in the “many non-theists” condition; $ps < .001$). Following prior work (e.g., Gervais, 2011), we were satisfied that our manipulation was effective at the sample level and therefore included all participants in the analyses. However, similar patterns emerged when including only those participants who

answered the manipulation check question in a way that corresponded to their prime (see [Supplementary Materials](#)).

We analyzed participants’ liking using a 4 (Participant Age: 5- to 6-year-old vs. 7- to 8-year-old vs. 9- to 10-year-old vs. adult) \times 2 (Participant Religion: theist vs. non-theist) \times 2 (Prime: many theists vs. many non-theists) \times 3 (Behavior Type: pro-social toward familiar person vs. pro-social toward unfamiliar person vs. neutral) \times 3 (Motivation: God vs. parents vs. self) mixed-model ANOVA with repeated measures on the last two factors. First, the omnibus ANOVA revealed a main effect of Behavior Type ($F(1.50, 420.85) = 264.51$, $p < .001$, partial $\eta^2 = .49$). Participants reported more liking for characters who performed pro-social behaviors toward unfamiliar people than familiar people ($p = .002$) and for characters who performed pro-social behaviors toward familiar people than for characters who performed neutral behaviors ($p < .001$). Second, we found a main effect of Participant Religion ($F(1, 280) = 6.78$, $p = .01$, partial $\eta^2 = .02$). Theists reported more overall liking than did non-theists ($p = .01$). Third, we found a main effect of Motivation ($F(1.79, 501.25) = 22.75$, $p < .001$, partial $\eta^2 = .08$). Participants reported more liking for characters who sought to make themselves rather than their parents happy and more liking for characters who sought to make their parents rather than God happy (both $ps = .001$). Importantly, the main effect of Prime failed to reach significance ($p = .88$), providing no evidence in favor of the theistic majority account. These main effects were qualified by a number of interactions, all of which are mentioned below or in [Supplementary Materials](#). No other effects reached significance ($ps \geq .10$).

Providing further support for the age-related changes observed in Study 1, we found a Participant Age \times Participant Religion \times Motivation interaction ($F(5.37, 501.25) = 4.10$, $p = .001$, partial $\eta^2 = .04$). In the two youngest age groups, theists and non-theists provided statistically identical evaluations of characters who performed their behaviors to make God happy ($ps \geq .58$), characters who performed their behaviors to make their parents happy ($ps \geq .55$), and characters who performed their behaviors to make themselves happy ($ps \geq .93$). Theist 9- to 10-year-olds reported more liking for characters who performed their behaviors to make God happy than did non-theist 9- to 10-year-olds ($p = .02$). Theists and non-theists in this age group did not differ in their evaluations of characters who performed their behaviors to make their parents happy ($p = .85$) or characters who performed their behaviors to make themselves happy ($p = .64$). Like the oldest children, theist adults reported more liking for characters who performed their behaviors to make God happy than did non-theist adults ($p < .001$); theist adults also reported more liking for characters who performed their behaviors to make their parents happy than did non-theist adults ($p = .01$). Theist and non-theist adults did not differ in their evaluations of characters who performed their behaviors to make themselves happy ($p = .97$; Fig. 2). Thus, as in Study 1, we found that religious background influenced older participants’—but not younger participants’—evaluations of religiously motivated characters.

Furthermore, we found a Participant Religion \times Prime \times Behavior Type interaction ($F(1.50, 420.85) = 3.93$, $p = .03$, partial $\eta^2 = .02$). In both priming conditions, theists and non-theists reported less liking for characters who performed neutral behaviors than for characters who performed either type of pro-social behavior (all ps for familiar/neutral and unfamiliar/neutral comparisons $< .001$). Additionally, in the “many theists” condition only, both theists ($p < .001$) and non-theists ($p = .04$) reported more liking for characters who performed pro-social behaviors toward unfamiliar rather than familiar people.

No other pairwise comparisons in this analysis reached significance ($ps = 1.00$; Fig. 3).

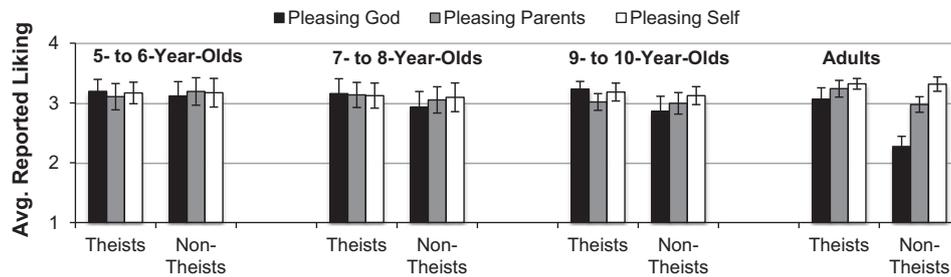


Fig. 2. Average reported liking, Study 2. Error bars represent 95% confidence intervals.

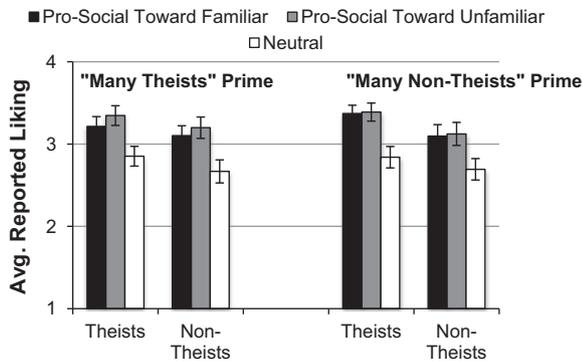


Fig. 3. Average reported liking, Study 2. Error bars represent 95% confidence intervals.

Most importantly for the main question of interest—whether participants would respond differently to religiously motivated characters when they were led to believe that most people were theists rather than non-theists—priming condition did not exert a significant main effect and was involved in only one significant interaction. The lack of a main effect of priming condition and the overall similarity of responses across primes (regardless of priming condition, participants reported more liking of characters who performed pro-social rather than neutral behaviors), as well as the fact that priming condition did not interact with motivation, suggest that perceptions of the prevalence of theists as compared with non-theists did not strongly influence judgments of religiously and secularly motivated characters. The Participant Religion \times Prime \times Behavior Type interaction suggests that participants may have been at least somewhat responsive to the priming condition; if the priming manipulation had had no effect on participants, this interaction may not have emerged. However, the priming manipulation may have had a stronger effect if it immediately preceded the experimental questions. The effect of the prime may have faded somewhat for children, who were taught how to use the scale after hearing the prime and before answering experimental questions.

3.3. Discussion

Study 2, which used a continuous measure, found similar patterns of results across age groups and religious backgrounds as did Study 1, which used a forced choice measure. The use of a continuous measure further showed that theists reported relatively high liking both for characters who performed their behaviors to make God happy and for characters who performed their behaviors to make their parents happy, suggesting that the lower-than-expected preferences for religiously motivated characters in Study 1 were due to relatively strong (rather than weak) liking for both characters.

Additionally, both studies showed a main effect of Behavior Type. However, due to different designs, the main effect should be interpreted differently across the two studies. In Study 1, participants reported greater preferences for *religiously motivated* characters (over secularly motivated characters, using a forced-choice paradigm) when they performed pro-social behaviors toward unfamiliar people rather than pro-social behaviors toward familiar people or neutral behaviors. In Study 2, participants reported greater preferences for *characters overall, collapsed across motivations* (using a continuous measure that asked separately about each character) when those characters performed pro-social behaviors toward unfamiliar people rather than pro-social behaviors toward familiar people or neutral behaviors. These differing designs may account for the different effect sizes across studies (.09 in Study 1 vs. .49 in Study 2). Nevertheless, across both studies, participants may have placed particular value on pro-social behaviors performed toward strangers because many religious traditions, as well as some cultural narratives, emphasize the importance of helping people one does not know (e.g., the Good Samaritan story, the appeals of charities who help individuals not known to the benefactors).

Importantly, in both studies, religious background exerted a stronger influence among adults than children, suggesting that this effect was not an artifact of a forced choice paradigm. Note that the effect size for religion was smaller in Study 2 than in Study 1, perhaps indicating that the differences between theists and non-theists are greater when they are forced to decide which of two characters they like better rather than when they are given the opportunity to respond in a more nuanced way. However, we urge caution when interpreting this difference: it may be an artifact based on the greater number of variables in Study 2 (see Olejnik & Algina, 2003, for a discussion of how the number of variables influences effect size measures), it was not predicted, and the patterns of results are qualitatively similar across studies. Indeed, it is difficult to determine whether the difference in effect sizes might have arisen by chance. Furthermore, although several interactions involving age in Study 2 produced moderately large effect sizes, the interaction between Participant Age, Participant Religion, and Motivation produced only a small effect size. The fact that age and religious background influenced participants' evaluations of religiously motivated behaviors across both Studies 1 and 2 suggests that this effect is reliable and, although small, it may still have practical importance (for a review of the practical importance of small effect sizes, see Greenwald, Banaji, & Nosek, 2015).

Additionally, Study 2 tested the hypothesis that children were more sensitive than adults to the greater prevalence of theists in society. If this factor accounted for the similarity between theist and non-theist children, then children led to believe that most people were non-theists should have reported greater liking of secularly motivated characters than children led to believe that most people were theists. However, the prime did not influence evaluations of religiously versus secularly motivated characters, suggesting that the perceived prevalence of theism may not have been

responsible for the similar responses observed between theist and non-theist children.

4. Study 3

The purpose of Study 3 was to test the intuition account, which suggests that the different results observed among theist and non-theist adults—despite similar results observed among theist and non-theist children—are due to the role of teleological intuitions and implicit pro-theist attitudes. Prior work (Banerjee & Bloom, 2014a; Evans, 2001; Kelemen, 2004) has suggested that children prefer purpose-based explanations that imply an intentional agent (e.g., God) over scientific explanations. Based on this work, we reasoned (in Studies 1–2) that children may have liked individuals whose actions were in line with the idea that God exists.

Over the course of development, people learn to override these initial intuitions (see Emmons & Kelemen, 2014, for related work). That is, adults reject teleological explanations when they have plenty of time to consider their answers. When responding under speeded conditions, however, adults—like children responding under unspeeded conditions—endorse teleological explanations (Kelemen & Rosset, 2009; Kelemen et al., 2013), indicating that these intuitions have been suppressed but not entirely replaced. Under the intuition account, therefore, theist and non-theist children may respond similarly because both are influenced by similar intuitions and because neither has yet overridden these intuitions. However, non-theist adults have overridden these intuitions on an explicit level, leading to large differences in explicit responding between theist and non-theist adults. To the extent that teleological intuitions persist implicitly among adults, these intuitions should predict pro-theist attitudes. To test the intuition account, Study 3 employed a series of speeded reaction time tasks intended to elicit adults' intuitions and investigated the relationship between intuitive teleology, explicit attitudes toward religiously motivated characters, and implicit pro-theist attitudes.

4.1. Method

4.1.1. Participants

The sample included participants (71 women and 46 men) between the ages of 18 and 81 years ($M_{\text{age}} = 38.87$ years, $SD_{\text{age}} = 15.61$ years).⁴ Data from 17 additional participants were excluded because they failed to correctly answer an attention check question. We recruited adults via Amazon Mechanical Turk and paid them \$0.55. On a demographic questionnaire completed at the end of the session, participants identified their race as White (81%), Black (7%), Asian (3%), multiracial (5%), and “other” (4%). Additionally, 8% of adults self-identified as Hispanic or Latino/a. On the same questionnaire, participants identified their religious affiliation as Protestant (18%), Catholic (12%), other Christian denomination (10%), Jewish (2%), Muslim (1%), atheist or agnostic (36%), and “other” (10%). The remaining 11% of participants did not identify their religious affiliation. Six of the participants who self-identified

as “other” wrote that they did not identify with a religion and were grouped with self-identified atheists and agnostics for subsequent analyses, for a total sample that was 45% non-theist. On average, participants reported attending services at a place of worship “once a year” ($M = 1.75$, $SD = 1.88$) and completing a 2 year college degree ($M = 3.97$, $SD = 1.54$).

4.1.2. Procedure

Participants completed several measures in counterbalanced order. In one section of the online survey, they responded to the items from Part II (main experimental questions) of Study 2.⁵ Half ($N = 58$) of the participants took as much time as they needed to answer each question; responses in this condition served as a measure of explicit reasoning. The remaining participants had a time limit of 6.8 s; responses in this condition served as a measure of implicit attitudes toward religiously and secularly motivated characters. Pilot testing revealed that this limit was two standard deviations higher than the average time taken to read each sentence without answering any questions afterward; this method of determining the time limit was adapted from Kelemen et al. (2013). Implicit attitudes that may be overridden during leisurely processing often emerge during speeded tasks (e.g., Greenwald, McGhee, & Schwarz, 1998; Kelemen et al., 2013); thus, comparing speeded and unspeeded responses to the same set of questions may highlight the role of implicit cognition in judgments of religiously versus secularly motivated characters. This speeded task used items specifically designed for the current research to measure attitudes toward religiously and secularly motivated characters, a topic that (to our knowledge) has not previously been examined using speeded responses.

All participants also completed a Religion Implicit Association Test (IAT; Greenwald et al., 1998), a speeded reaction time task that measured implicit attitudes toward theists and atheists. Although many prior studies have used some version of the IAT (Greenwald et al., 2015), to our knowledge, the present IAT is the first to compare associations with theist versus atheist names. Participants viewed names of theists (John Calvin, Nelson Mandela, William Penn, Brigham Young) and atheists (Richard Dawkins, Stephen Hawking, Karl Marx, Friedrich Nietzsche) as well as good words (Beautiful, Happy, Joy, Pleasure) and bad words (Awful, Horrible, Nasty, Terrible). According to pilot testing conducted with American adults recruited from Amazon Mechanical Turk, theist and atheist names were matched on accuracy (overall, participants categorized theist names as theist as often as they categorized atheist names as atheist) and explicit liking (overall, participants reported liking the group of theists as much as the group of atheists).⁶ Good and bad words were taken from prior IAT

⁵ Prior to answering these items, participants also answered 12 questions indicating how much they liked a character who performed each behavior without a specified motivation (e.g., “A person helped someone he/she didn't know do homework. How much do you like this person?”). These questions were modeled on an earlier version of Study 2, which also included these items. These items were initially conceived as control questions testing how much participants liked characters who performed each behavior in the absence of information about motivations. These questions were always placed before any items where motivations were explicitly stated to avoid priming participants to fill in particular motivations even when none were given. However, as an anonymous reviewer pointed out, the placement of these questions at the beginning of the study is also problematic; any differences that emerged between the control condition and the other conditions may have simply reflected order effects. Therefore, we re-ran Study 2 without this condition and did not analyze responses to these items in Study 3.

⁶ The accuracy (percentage of participants who correctly categorized each name as theist or non-theist) and liking (on a scale from 1 to 7, where 1 indicated the least amount of liking) for each name are as follows: Friedrich Nietzsche (84%, 4.18), Karl Marx (88%, 3.52), Richard Dawkins (76%, 4.51), Stephen Hawking (74%, 5.1), William Penn (73%, 4.24), Brigham Young (88%, 3.45), John Calvin (84%, 3.86), and Nelson Mandela (88%, 5.32). During the main experiment, in addition to recording classification speed, we also recorded classification accuracy. Participants in the main experiment correctly classified exemplars on 88% of trials.

⁴ Because the adult samples in Studies 1–3 includes a wide age range, we also ran a series of regressions for each study, entering adults' age in years as the predictor variable. In Study 2, the older adults were, the more they reported liking characters who performed their behaviors to make God happy ($B = .028$, $SE = .006$, $F(1, 116) = 22.54$, $p < .001$), characters who performed their behaviors to make their parents happy ($B = .020$, $SE = .004$, $F(1, 116) = 26.40$, $p < .001$), and characters who performed their behaviors to make themselves happy ($B = .007$, $SE = .003$, $F(1, 116) = 4.74$, $p = .03$). In Study 3, the older adults were, the stronger were their pro-theist preferences on the IAT ($B = .007$, $SE = .002$, $F(1, 107) = 9.17$, $p = .003$). Age did not predict responses to any other dependent measures (i.e., liking for religiously and secularly motivated characters in Studies 1–3 and responses to the teleology measure in Study 3).

research. Participants were instructed to categorize the names as either “theist” or “atheist” and to categorize the other words as either “good” or “bad”; before beginning the IAT, participants were also told which names were theists, which were atheists, which words were good, and which were bad. On some trials, participants pressed the A key if they saw a good word or a theist name and the L key if they saw a bad word or an atheist name. On other trials, the pairings were reversed such that participants used one key to categorize atheist names and good words and a different key to categorize theist names and bad words. The IAT was included as an additional, previously validated methodology to measure implicit attitudes.

Furthermore, all participants completed a measure of teleology (Kelemen et al., 2013). Teleological explanations account for phenomena by referencing a purpose (see examples below). They can also be associated with religious belief, although the relationship may be relatively weak (Evans, 2001; Kelemen, 2004; Kelemen & DiYanni, 2005; Willard & Norenzayan, 2013). For example, teleology may lead to or reinforce theistic worldviews because if objects were created for a purpose, they must have been created by an agent, and God could be perceived as such an agent. In the teleology task, participants indicated whether a number of statements were true or false. Test items made scientifically unwarranted teleological claims (e.g., “Moss forms around rocks in order to stop soil erosion”). Control items made one of four claims: true causal explanations (e.g., “Magnets stick together because their poles attract”), true teleological explanations (e.g., “People wear contact lenses in order to see more clearly”), false causal explanations (e.g., “Soup is hot because it is primarily liquid”), and false teleological explanations (e.g., “Houses have doorbells in order to make dogs bark”). Unlike test items, false teleological explanations among the control items concerned the domains of social convention and human-made artifacts; teleological explanations in these domains may sometimes be correct, but the particular sentences presented in this condition were inaccurate. To measure unconscious intuitions about teleology, participants were given 3.2 s to respond to each item (for scoring information, see [Supplementary Materials](#)). This measure was included to test the hypothesis that intuitive teleology would predict pro-theist preferences and was taken directly from prior research. The novel contribution of including this measure was the investigation of its relationship with pro-theist attitudes.

4.2. Results

4.2.1. Reported liking for religiously and secularly motivated characters

We analyzed the extent to which participants reported liking each character using a 2 (Participant Religion: theist vs. non-theist) \times 2 (Condition: speeded vs. unspeeded) \times 3 (Behavior Type: pro-social toward familiar person vs. pro-social toward unfamiliar person vs. neutral) \times 3 (Motivation: God vs. parents vs. self) mixed-model ANOVA with repeated measures on the last two factors. This analysis revealed three main effects, all of which also emerged in Study 2. First, we found a main effect of Participant Religion ($F(1, 111) = 9.74, p = .002, \text{partial } \eta^2 = .08$). Overall, theists reported more liking than did non-theists ($p = .002$). Second, we found a main effect of Behavior Type ($F(1.48, 164.25) = 33.81, p < .001, \text{partial } \eta^2 = .23$). Participants reported less liking for characters who performed neutral behaviors than for characters who performed either type of pro-social behavior ($ps < .001$); the two pro-social categories did not differ from each other ($p = .11$). Third, we found a main effect of Motivation ($F(1.73, 191.62) = 21.32, p < .001, \text{partial } \eta^2 = .16$). Participants reported marginally more liking for characters who sought to make themselves rather than their parents happy ($p = .06$) and more liking for characters

who sought to make their parents rather than God happy ($p < .001$). These effects were qualified by three interactions that are not crucial to the arguments made here, all of which are discussed in [Supplementary Materials](#). No other main effects or interactions reached significance ($ps > .06$).

4.2.2. IAT

We calculated IAT scores following the algorithm outlined by Greenwald, Nosek, and Banaji (2003). The test was scored such that positive values indicated faster responses in the theist + good/atheist + bad condition (indicating a pro-theist preference or anti-atheist bias) and negative values indicated faster responses in the atheist + good/theist + bad condition. Following the guidelines outlined by Greenwald et al. (2003), we excluded nine participants who responded in under 300 ms to at least 10% of the trials. One-sample *t*-tests comparing mean IAT scores to zero revealed pro-theist preferences among both theists ($M = .46, SD = .35, t(55) = 9.74, p < .001$) and non-theists ($M = .17, SD = .38, t(52) = 3.29, p = .002$). These findings indicate some level of implicit pro-theist preference; that is, even non-theists preferred theists to non-theists when responding under speeded conditions. On the one hand, this finding is consistent with prior work measuring constructs related to preference; for example, Gervais (2014a) found that even non-theists found immoral behaviors to be representative of other non-theists. On the other hand, this finding contrasts sharply with the explicit results of Study 1, where non-theist adults reported strong explicit preferences for characters who were secularly motivated rather than characters who were religiously motivated, and with the results from Study 3’s measure of explicit liking for religiously and secularly motivated characters, in which secularly motivated characters received higher ratings of liking. Nevertheless, an independent-samples *t*-test revealed stronger pro-theist preferences among theists than among non-theists ($t(107) = 4.14, p < .001$), indicating stronger implicit pro-theist preferences among theists than among non-theists.

4.2.3. Intuitive teleology

We compared the number of errors on test trials to the number of errors on control trials; as described above, responses to both categories were provided under speeded conditions. This operationalization takes into account individual differences such as overall reading speed, overall propensity to respond “true,” and so on. Paired-samples *t*-tests comparing test and control trials revealed evidence of intuitive teleology among both theists ($M_{\text{test}} = .63, SD_{\text{test}} = .26, M_{\text{control}} = .18, SD_{\text{control}} = .17, t(62) = 12.54, p < .001$) and non-theists ($M_{\text{test}} = .39, SD_{\text{test}} = .27, M_{\text{control}} = .08, SD_{\text{control}} = .10, t(52) = 9.20, p < .001$). (For additional evidence of intuitive teleology even among non-theists, see Jarnefelt, Canfield, & Kelemen, 2015.) Independent-samples *t*-tests showed that theists made more errors than did non-theists on test trials ($t(114) = 4.80, p < .001$) and control trials ($t(103.58) = 3.90, p < .001$).

4.2.4. Relationship between intuitive teleology and attitudes toward theists

As in previous work (Willard & Norenzayan, 2013), we used endorsement of scientifically unwarranted teleological claims (i.e., error rate on test trials) as an individual differences measure. This error rate was positively correlated with preferences for the religiously motivated character. Collapsing across all behavior types, the more participants endorsed scientifically unwarranted teleological claims, the greater liking they reported of characters who performed behaviors to make God happy ($r = .29, p = .002$).⁷

⁷ This correlation was also significant for each of the three individual behavior types ($rs \geq .271, ps \leq .003$).

Across motivations and behavior types, endorsement of scientifically unwarranted teleological claims was not associated with liking for secularly motivated characters ($|r|s \leq .14$, $p \geq .14$), suggesting that intuitive teleology uniquely predicted pro-theist preferences as opposed to liking for other people in general. The correlation between intuitive teleology and reported liking for all religiously motivated characters was significantly different from the correlation between intuitive teleology and reported liking for all secularly motivated characters ($p < .001$).

Across all religious and secular motivations and all behavior types, responses to control items on the teleology measure significantly predicted reported liking only in two cases: for characters who performed pro-social behaviors toward unfamiliar people to make their parents happy ($r = -.21$, $p = .03$) and for characters who performed pro-social behaviors toward unfamiliar people to make themselves happy ($r = -.21$, $p = .02$). Responses to control items did not significantly predict reported liking for any other characters ($ps \geq .10$), and the two significant correlations dropped to non-significance after applying a Bonferroni correction, indicating that they may have been the result of Type I error. The correlation between responses to control items and reported liking for all religiously motivated characters was significantly different from the correlation between responses to control items and reported liking for all secularly motivated characters ($p = .002$). The lack of a reliable relationship between responses to control items and liking for the characters suggests that endorsement of scientifically unwarranted teleological claims, not endorsement of causal claims more broadly, predicted pro-theist preferences.

Previous work has shown that religiosity is associated with endorsement of teleological claims to some extent (e.g., Willard & Norenzayan, 2013); thus, one interpretation of the results presented here is that religiosity, rather than teleology *per se*, is responsible for the association between intuitive teleology and pro-theist preferences. Although the current research did not directly ask participants about their religiosity, we attempted to gain some insight into this issue by investigating the relationship between endorsement of scientifically unwarranted teleological claims and preferences for the religiously motivated character controlling for the frequency with which participants reported attending services at a place of worship. This partial correlation remained significant ($r_p = .20$, $p = .03$), indicating that the relationship between teleology and pro-theist preferences was not entirely due to frequency of attendance at worship services. Investigating the role of religiosity in this relationship remains a promising avenue for future research.

Endorsement of scientifically unwarranted teleological claims was positively correlated with IAT scores ($r = .24$, $p = .01$), whereas endorsement of control items did not predict IAT scores ($r = .09$, $p = .36$), although the difference between these correlations did not reach significance ($p = .16$). The more participants endorsed scientifically unwarranted teleological claims, the stronger were their implicit pro-theist preferences. The lack of relationship between control items on the teleology measures and IAT scores suggests that it may be endorsement of scientifically unwarranted teleological claims, not endorsement of causal claims more broadly, that predicted implicit pro-theist preferences. The correlation between intuitive teleology and implicit preferences for theists over atheists (as measured by the IAT) remained marginally significant even when controlling for frequency of attendance at worship services ($r_p = .16$, $p = .09$). However, religiosity is not entirely captured by attendance at worship services, and investigating religiosity directly is an important future direction.

4.3. Discussion

The purpose of Study 3 was to investigate why theist adults reported greater pro-theist preferences than did non-theist adults

despite the fact that theist and non-theist children in Study 1 responded similarly to each other. Study 2 failed to find strong support for the *theistic majority* account, which posited that this pattern was due to the greater perceived prevalence of theists as compared with non-theists. Study 3 tested the *intuition* account, which posited that the difference between theist and non-theist adults occurred because non-theist adults needed time to learn to override initial impulses favoring teleological explanations. The extent to which teleological intuitions persisted implicitly was expected to predict preferences for religiously motivated characters and implicit pro-theist attitudes.

The results from the IAT and the intuitive teleology measure supported the intuition account. The IAT revealed pro-theist preferences among both theists and non-theists. Previous research has demonstrated that IAT results are orthogonal to the prevalence of particular groups. For example, adults in the United States and Japan failed to show any preference on an American–Japanese IAT, despite the greater prevalence of Americans in the United States and Japanese individuals in Japan (Dunham, Baron, & Banaji, 2006); Black and multiracial children in South Africa showed implicit preferences for multiracial over Black despite the fact that Black people constitute about 80% of the South African population (Dunham, Newheiser, Hoosain, Merrill, & Olson, 2014); and the IAT revealed pro-female preferences despite the fact that women and men are approximately equally prevalent (Rudman & Goodwin, 2004). Given this prior work, it seems unlikely that the patterns of implicit preferences in the current study emerged as a result of the proportion of theists to non-theists in the United States.

The intuitive teleology measure provided additional data in support of the intuition hypothesis. The more likely participants were to intuitively perceive purpose-driven design in the world around them, the stronger were their pro-theist preferences. One possibility is that the more individuals perceive aspects of the world as created for a purpose, the more drawn they may be to individuals whose motivations are in line with the belief that an intentional agent (i.e., God) could be responsible for such creation. Note that this line of thinking points to the relationship among three distinct phenomena: teleology (the belief in purpose-based creation), theism (the belief that God is real), and attitudes toward theists. Although teleology and theism are not the same, they may be linked because people who judge that natural phenomena were created for a purpose may ascribe this creation to God. Additionally, individuals who endorse teleological statements may hold particularly strong pro-theist preferences because theists endorse the existence of a being who, in Judeo-Christian thought, is capable of creating natural phenomena. Indeed, for theists, teleological statements may be consistent not just with early intuitions but also with explicitly endorsed religious doctrine. Thus, suppressing these intuitions may be particularly difficult for theists.

The intuitive teleology measure is unrelated to the prevalence of theists (no items mention theists or religion); therefore, it is unlikely that the relationship between intuitive teleology and pro-theist preferences reflects judgments that emerged as a result of perceiving theists to be especially prevalent. Rather, in a sense, participants higher in intuitive teleology were more similar to the young children in Studies 1–2 who reported stronger pro-theist preferences than did adults, regardless of the children's own religious background. If this difference between children and adults was due to children's high level of intuitive teleology, as has been suggested previously (e.g., Bloom, 2007; Kelemen, 2004), then adults who had higher levels of intuitive teleology would be expected to respond more like children than adults who had lower levels of intuitive teleology. This is, indeed, the pattern we observed in Study 3.

Importantly, we did not find complete evidence for the stronger version of the intuition account. For example, participants who responded to religiously and secularly motivated characters under speeded conditions did not report stronger preferences for religiously motivated characters than participants who responded under unspeeded conditions. This result may be a measurement artifact; these particular stimuli have not previously been used in a reaction-time task, whereas both the IAT and the intuitive teleology measure were specifically developed for speeded conditions. This result may also point to important limitations of intuition; children's early intuitions may concern teleological explanations broadly rather than particular behaviors motivated by theistic concerns. In this case, asking adults to respond to religiously motivated characters under speeded conditions would not have recreated the intuitions that influenced young children. The current research found stronger support for the intuition account than for the theistic majority account, and future research can determine the boundary conditions of early intuitions.

5. General discussion

The present research investigated how religious and secular motivations influence children's and adults' social judgments. In Study 1, religious background exerted a stronger influence on adults' rather than children's responses. Non-theist children failed to report preferences for secularly motivated behaviors and the characters who performed them; in fact, religious background exerted no influence on the judgments of the youngest children in this study (5- to 6-year-olds). However, the responses of adults from different religious backgrounds sharply diverged. Unlike non-theist children, non-theist adults reported pro-secular preferences; in fact, by adulthood, non-theists' pro-secular preferences were stronger than theists' pro-theist preferences. In Study 2, in which participants had the option to report liking all characters equally, religious background continued to exert a stronger influence on adults' rather than children's responses. This developmental pattern may highlight the greater role of reflective reasoning among adults than among children. Non-theists' early intuitions may differ from their explicit judgments, and adults' (versus children's) social preferences may be more strongly driven by reflection and deliberation, leading to developmental differences among non-theists. Meanwhile, theists' early intuitions may line up with religious doctrine that theists explicitly endorse, leading to developmental consistency among theists. Consistent with this explanation, whereas Study 2 failed to find strong evidence supporting the *theistic majority* account, Study 3 provided some evidence in favor of the *intuition* account.

5.1. The role of intuitive teleology in religious cognition

As discussed immediately above, Study 2 failed to find strong evidence supporting the *theistic majority* account, which posits that children were more influenced than adults by the greater perceived prevalence of theists as compared with non-theists. Study 3 provided some evidence in support of the *intuition* account, which primarily interfaces with work on intuitive teleology—the idea that young children find purpose-based explanations intuitively compelling and that such intuitions can be effortfully overridden in adulthood (Evans, 2001; Kelemen et al., 2013). Teleological intuitions—which may favor theistic worldviews because such worldviews posit the existence of a creator (Kelemen, 2004)—may be in place among young children from theist and non-theist backgrounds, leading children from both groups to demonstrate equal levels of liking for characters whose actions are consistent with participants' intuitions about creation. With

age, non-theists may learn to override such early intuitions, leading to large differences between non-theist adults (who explicitly override teleological intuitions and pro-theist attitudes, despite the persistence of these judgments on speeded reaction-time tasks) and theist adults (who continue to endorse these intuitions and attitudes). If the intuition account is correct, the degree to which teleological intuitions persist on an implicit level among adults should predict those adults' pro-theist preferences.

While a strong version of the intuitive teleology account predicts that all children would develop theistic ideas regardless of cultural input, it is likely that initial intuitions and cultural learning together shape adults' cognition. One possibility is that early-emerging intuitions make children receptive to religious ideas while testimony from others in one's culture is responsible for shaping representations of particular deities and encouraging individuals to commit to particular theologies and rituals (Banerjee & Bloom, 2013; Gervais, Willard, Norenzayan, & Henrich, 2011; Rottman & Kelemen, 2012). The current work contributes to this literature by suggesting that, in childhood, intuitions may exert a stronger influence than testimony. Five- and six-year-olds responded identically to religiously motivated characters regardless of their own religious background, despite the fact that children of this age can articulate their own religious beliefs (Heiphetz, Spelke, Harris, et al., 2013), can distinguish between members of different religious groups (Heiphetz et al., 2013), and receive different testimony regarding religious ideas. As individuals develop, they may begin to override these initial intuitions, making other factors (e.g., testimony, one's own perspectives) more powerful in adulthood than they were in childhood.

The results from Study 3 are not necessarily inconsistent with a world in which religious beliefs are determined solely by cultural learning. We interpret Study 3 as providing evidence for the intuition account in part based on the notion that the IAT is less susceptible to social learning than are reports on explicit measures. For example, although White adults demonstrate levels of implicit racial bias that are comparable with those demonstrated by White children, adults' reported attitudes are more egalitarian than those of children (Baron & Banaji, 2006)—a result that may indicate that White adults' explicit attitudes are sensitive to social learning (i.e., adults have learned that it is not acceptable to report or harbor pro-White attitudes) but that implicit attitudes remain immune to such learning.

However, implicit measures may not be entirely immune to social learning. Implicit gender attitudes may be influenced by early experiences with female versus male caregivers (Rudman, 2004), implicit racial attitudes among Black participants may be influenced by cultural learning (Nosek, Banaji, & Greenwald, 2002), and implicit cooperative judgments may be influenced by a partner's behavior on a previous turn (Rand & Nowak, 2013). Thus, the results of Study 3 could have emerged in a world where religious beliefs are acquired only via social learning, if this social learning also influenced implicit attitudes toward theists versus atheists. In the world in which we actually live (i.e., a world in which religious beliefs have been shown to arise from intuition as well as cultural learning, Kelemen, 2004), the results of Study 3 appear more consistent with the intuition account than the theistic majority account. However, these results do not indicate that social learning can never play a role in religious cognition.

5.2. The development of social preferences

The current work also revealed four noteworthy findings concerning the development of social preferences. First, the degree to which teleological intuitions were evident on an implicit level predicted adults' reported liking of religiously motivated

characters and their implicit pro-theist preferences. Although teleology and social preferences have been studied largely separately until this point, this finding demonstrates that the two constructs are associated. The more adults implicitly endorsed unwarranted teleological claims, the more strongly they preferred theists and religiously motivated individuals. Although it is not possible to draw causal conclusions from correlational evidence, one possibility is that this relationship occurred because teleological claims are consistent with theistic worldviews that posit the existence of a creator (Kelemen, 2004), and individuals prefer those whose beliefs are consistent with their own (e.g., Mahajan & Wynn, 2012; Townsend, Major, Sawyer, & Mendes, 2010).

Second, explicit preferences for those who shared one's own potential motivations and beliefs emerged earlier in development for majority group members (theists) than for minority group members (non-theists). As discussed above, this finding is likely due to the cognitive effort required for non-theists to override initial teleological intuitions and pro-theist attitudes.

Third, when non-theists did develop explicit preferences favoring characters who acted for secular reasons over characters who acted for religious reasons, such preferences were stronger than those observed among theists (see Study 1). One possibility is that preferences developed as a result of cognitive effort are stronger than preferences in the same domain that progress unchanged over time, perhaps because adults perceive strong preferences as a justification for the effort they have expended (i.e., relieving cognitive dissonance). At present, this possibility is speculative, and future work could investigate non-theist adults' strong explicit preferences for other non-theists.

Fourth, despite the fact that non-theist adults demonstrated strong explicit pro-secular preferences, they also showed implicit pro-theist preferences. This finding suggests that the effortful overriding of attitudes toward theists and non-theists is only partially successful, as attitudes favoring theists over non-theists persist on an implicit level. Although some (e.g., Arkes & Tetlock, 2004) have argued that IAT scores could reflect an awareness of cultural norms (in this case, an awareness of prevailing anti-atheist bias) rather than participants' own attitudes, this account is unlikely to fully explain the present data. Prior work (Nosek & Hansen, 2008) has shown that cultural knowledge is not associated with implicit attitudes. Furthermore, despite living in the same culture, theists and atheists showed different magnitudes of pro-theist preferences in Study 3. Targets of bias are likely intimately familiar with that bias—even more familiar than the perpetrators of the bias (e.g., Kahn, Ho, Sidanius, & Pratto, 2009; Swim, Mallett, Russo-Devosa, & Stangor, 2005). Therefore, if familiarity with cultural norms explained implicit attitudes, and if a difference between groups emerged on the IAT, members of the subordinate group (versus the dominant group) would be expected to show stronger preferences for the dominant group, on average. Consistent with prior work failing to find this pattern (e.g., Nosek et al., 2007), and inconsistent with a cultural learning account of IAT scores, Study 3 revealed stronger implicit pro-theist attitudes among theists than among non-theists.

The findings concerning social preferences raise two alternative interpretations of the results presented here. First, preferences for characters who are more similar to participants may emerge more slowly among non-theists because preferences for those perceived to share one's group membership emerge slowly in minority group members generally. Second, adults' explicit responses may have been driven by social desirability concerns and, therefore, those responses may not be indicative of adults' true judgments. We believe both of these explanations are unlikely; see [Supplementary Materials](#) for further discussion.

5.3. Future directions

The current work is among the first to demonstrate that religious background has a stronger influence on adults', as compared with children's, religion-based social preferences. Thus, these findings raise a number of questions for future exploration.

Because the focus of the current work was on attitudes toward religiously motivated characters and theists, we compared theists and non-theists. Future work can examine finer-grained distinctions between members of different religions. Religions vary in the emphasis they place on constructs such as honoring God and obeying one's parents. Furthermore, religions differ in the emphasis they place on internal motivations versus the outcomes of behaviors. Thus, preferences specifically for religiously motivated characters may be attenuated among Jewish and Catholic participants, who may be more likely to favor characters on the basis of behaviors (Cohen, Siegel, & Rozin, 2003). Additionally, future work can examine differences based on religiosity and strength of belief in God, as the effects observed here might be stronger for more religious participants or participants who believe in God more strongly.

Just as there are different categories of religious affiliation, there may be different categories of non-religious affiliation. Norenzayan and Gervais (2013) have argued that there are multiple categories of atheists, including mind-blind atheism (resulting from difficulty with mentalizing tasks), apatheism (resulting from secure living conditions that lead to lack of motivation for theism), inCREDulous atheism (resulting from lack of cultural teaching about theism), and analytic atheism (resulting from effortfully reasoning in a way that leads individuals to atheistic beliefs). Although the current work did not specifically target these different categories and did not ask participants what type of non-theist they were, it is possible that different kinds of non-theists reason differently about religiously motivated individuals. For example, individuals who have arrived at their non-theistic beliefs with great effort may be especially likely to prefer secularly motivated individuals. Similarly, adults who have moved from a religious orientation to a non-religious one—who may be especially likely to be analytic atheists—may differ from adults who have never been religious. In line with the folk notion that new converts are especially zealous, adult non-theists who were raised in religious backgrounds may exhibit particularly strong explicit preferences for secularly motivated individuals. To the extent that implicit attitudes are rooted in early life experiences (Rudman, 2004) and appear relatively stable across development (Baron & Banaji, 2006), they may be less likely to vary across different categories of non-theists.

Future work can also investigate the intuition account cross-culturally. Much research in psychology—including much work on intuitive teleology and religious cognition—focuses on participants from non-representative (Western, educated, industrialized, rich, and democratic) cultures (Henrich, Heine, & Norenzayan, 2010). However, if early teleological intuitions can emerge in the absence of cultural learning, evidence of these constructs should exist in cultures where atheism is prevalent as well as cultures where theism is prevalent. The current research opted to manipulate rather than measure perceived prevalence of theists to afford stronger causal conclusions. However, investigating intuitions across cultures would add real-world evidence and shed light on the role of cultural learning in religious cognition.

6. Conclusions

The current research showed that judgments of religiously and secularly motivated characters developed differently among

theists and non-theists. We argued that the differences between theist and non-theist adults, in the face of similarities between theist and non-theist children, reflect the influence of intuitions favoring teleological explanations—intuitions that non-theist adults have learned to override at an explicit level. These findings contribute to the literature on intuitive teleology by highlighting the persistence of early intuitions on an implicit level even among adults and to the literature on intergroup relations by revealing the influence of religious and secular motivations on children's and adults' social preferences.

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Appendix A. Behaviors used in Studies 1–3

A.1. Pro-social behaviors toward familiar people

Helped his/her friend make an art project for school.
 Played a game with his/her little brother.
 Gave his/her friend one of his/her cookies.
 Bought his/her friend a can of grape juice.

A.2. Pro-social behaviors toward unfamiliar people

Helped someone he/she didn't know do homework.
 Played a game with the new kid at school.
 Gave his/her lunch to someone who looked hungry.
 Gave money to someone who was poor.

A.3. Neutral behaviors

Watched his/her teacher help another student do math problems.
 Watched some other people play a game.
 Ate a grilled cheese sandwich.
 Walked past a store on his/her way home from school.

Appendix B. Vignettes used in Study 2

B.1. Theist prime

Let's talk about how many people believe in God. It turns out that lots of people think that God is real. They think that God can hear everyone who prays out loud, and they don't think that anything in the world can be made without God. On weekends, many people go to special places like churches and synagogues to learn about God and spend time with their friends.

B.2. Non-theist prime

Let's talk about how many people believe in God. It turns out that lots of people think that God is not real. They think that only other people can hear everyone who prays out loud, and they don't think that God made everything in the world. On weekends, many people go to special places to learn new things and spend time with their friends.

Appendix C. Supplementary material

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.cognition.2015.07.017>.

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