Children's developing understanding of the cognitive abilities of supernatural and natural minds: Evidence from three cultures

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41   **Abstract**
42   Despite a wealth of research exploring developmental patterns of children's understanding of
43   the thoughts and desires of another (or, their theory of mind), relatively little research has
44   explored children's developing understanding of supernatural minds. Of the work that exists,
45   very few studies have explored whether patterns are similar in other cultural contexts, or
46   religious traditions outside of Western, Educated, Industrialized, Rich, and Democratic
47   (WEIRD) societies. To address this deficit, the present study recruited 2-to-5-year-old
48   children from three countries (United Kingdom, Albania, and Israel) with different religious
49   traditions (Christian, Muslim, and Jewish). Children completed two perception (audio and
50   visual) tasks and one memory task assessing their understanding of natural and supernatural
51   minds' cognitive abilities. Analyses revealed different patterns for responses about human
52   minds. However, there were similar results across samples for responses about God,
53   suggesting a shared developmental pattern. We conclude that children from religious
54   traditions with a High God (God, Allah, HaShem) share a similar developing concept of God.
55
56   Keywords: God concepts, cultural learning, cross-cultural, social learning, omniscience,
57   anthropomorphism
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Humans, compared to other species, have a remarkable ability to infer the thoughts, intentions and desires of others. Even more remarkably, adults and even very young children make these inferences about entities we cannot see, such as supernatural minds (e.g., ghosts, God, the tooth fairy). Although this early developing ability is extraordinary, only a small body of research has examined how children conceptualize supernatural entities' minds (Barrett, Newman, and Richert 2003, Barrett, Richert, and Driesenga 2001, Burdett, Wigger, and Barrett 2019, Giménez-Dasí, Guerrero, and Harris 2005, Kiessling and Perner 2014, Knight 2008, Knight et al. 2004, Lane, Wellman, and Evans 2010, 2012, Makris and Pnevmatikos 2007, Moriguchi, Takahashi, Nakamata, and Todo 2019, Nakamichi 2013, Nyhof and Johnson 2017, Richert and Barrett 2005, Richert et al. 2016, Wigger, Paxson, and Ryan 2013). In this study we examined 2-to-5-year-old children's knowledge attributions of various supernatural and natural minds in three different religious and cultural contexts.

BACKGROUND

In understanding how other minds work (i.e., having a theory of mind or ToM), a crucial milestone is recognizing that beliefs are not simply veridical impressions concerning things in the real world, but are potentially faulty representations (Leslie 1987, 1994, Leslie, Friedman, and German 2004). To test this critical aspect of ToM, children are usually given a task where they have to take the perspective of another. A common task is the Surprising Contents task. Children are shown a branded container (e.g., a cracker box) and asked what is inside. Their response usually corresponds to the picture on the box (crackers). The experimenter opens the box and reveals something surprising such as pencils. The experimenter then asks the child whether another person (usually a friend) who has not seen the true contents, whether s/he would know there were pencils inside the box. Children succeed in this task when they can confidently say their friend would think there are crackers, indicating understanding that beliefs can be false, and that they are shaped by perceptual experience (in this case, the appearance of the box).

Children typically develop a stable understanding of the mental states of others—thoughts, desires, and emotions—and usually pass these sorts of tasks around the age of 4 or 5 years (Wellman, Cross, and Watson 2001). This work has shown that typically developing children progress through certain facets of ToM in a particular pattern. For example, studies show that the ability to understand desires develops around two years of age (Bartsch and Wellman, 1995). By three years of age, children understand that people act on their desires and beliefs (Bartsch and Wellman 1995). A further component, is that children understand "Knowledge Access" and acquisition, or knowing what people have seen or heard to gain knowledge (Wellman and Liu 2004). A final step is that children understand that people act according to their beliefs, even if their beliefs are wrong or their emotions are hidden (Wellman and Liu 2004).

A universalist approach would say that performance on ToM tasks would be the same across all cultures (Callaghan et al. 2005). However, new evidence suggests that particular social and environmental influences shape ToM development. For example, children who have older siblings (Ruffman et al. 2011), who are exposed at an early age to conversations about mental and emotional language (Cutting and Dunn 1999, Peterson and Slaughter 2003, Ruffman, Slade, and Crowe 2002), who have parents who are attuned to their children's mental states (Hughes, Devine, and Wang 2018), and who are of higher socioeconomic status (Cutting and Dunn 1999), have been known to develop facets of ToM earlier.

Additionally, there is also a growing body of literature that demonstrates significant cross-cultural differences in both the rate (Oh and Lewis 2008) and sequence of different

110 facets of ToM development (Shahaeian et al. 2014, Shahaeian et al. 2011, Wellman, Cross,
111 and Watson 2001, Wellman et al. 2006). For example, compared to Western children from
112 Australia, Germany, and the USA (Kristen et al. 2006, Peterson, Wellman, and Liu 2005),
113 Chinese and Iranian children developed an earlier understanding of whether someone had
114 access to information and whether someone might have different beliefs or opinions
115 (Shahaeian et al. 2011, Wellman et al. 2006). Evidence from the above studies suggests that
116 the progression of understanding different facets of 'mind' (e.g., beliefs, knowledge) can be
117 influenced by family and culture.
118 　　　Nevertheless, little research has explored cultural influences on children's
119 understanding of non-human minds (e.g., animals, God), leaving gaps in our understanding of
120 this area of ToM development. The first gap is an unclear understanding of cultural influence
121 on conceptualization of supernatural minds. Given that understanding human minds, with
122 which children have considerable and relatively direct interaction, appears to vary in some
123 respects across cultures, we might expect to see even greater diversity concerning
124 supernatural minds. Because they are regarded by adults as having different sorts of minds
125 (e.g., ancestor spirits, demons, local deities, God), discourse around their mental states
126 (percepts, beliefs, desires) and actions are likely to vary considerably across cultural settings.
127 Indeed, even within a particular cultural group there may be little consensus over what a
128 given supernatural being perceives, knows, or feels.
129 　　　Children's participation in religious communities likely influences how they conceive
130 of these minds. Based on the work by Lane and colleagues (2012) and Richert and colleagues
131 (2016), it appears that children attending church and religious schools have a richer
132 understanding of God and supernatural minds compared to other children. In particular, Lane
133 et al (2012) found that children from Christian homes were more accurate (theologically) in
134 their attributions of knowledge to God than children who were not from religious
135 backgrounds. Additionally, in an American sample, Richert and colleagues (2016) have
136 reported that Muslim children, compared to Protestant, Catholic, and religiously non-
137 affiliated children, differentiate most clearly God's mind from human minds. Further, they
138 found that these children's concept of God was predicted by their parents' concepts of God.
139 Thus, children being raised in a Muslim context, where God is described in non-
140 anthropomorphic terms and Jesus is not recognised as (a) God, were more likely to see God
141 as fundamentally separate from humans.
142 　　　A second gap in our understanding concerns the types of knowledge that supernatural
143 beings have. In addition to the lack of research with cross-cultural samples, research
144 examining children's concepts of God has almost exclusively used a Christian God and
145 particularly focused on God's factual knowledge about specific objects in the world (Barrett,
146 Richert, and Driesenga 2001, Knight et al. 2004, Lane, Wellman, and Evans 2012), which is a
147 fairly narrow range, as others have observed (Lane et al. 2014). Most research in this area has
148 used variations of the Surprising Contents task, though there are some exceptions (Barrett,
149 Newman, and Richert 2003). God's memory and perception have been under-studied in any
150 religious or cultural condition, let alone across them.
151 　　　Third, we do not know how children differentiate these other types of knowledge
152 states among minds with variable abilities. We know that early school-aged children (five-
153 and six-year-olds) differentiate God from human minds when it comes to knowing the
154 surprising contents of a closed container (Barrett, Newman, and Richert 2003, Knight 2008,
155 Knight et al. 2004), particularly if the child knows the contents: God is likely to know the
156 contents whereas a human being who has not had perceptual access to the container is
157 unlikely to know the contents. Developing the ability to make this distinction is important
158 because it indicates the child may understand the abilities of supernatural versus non-human
159 versus human minds. Prior work has shown mixed results regarding whether three-year-olds

160 can differentiate among these minds (Burdett et al. 2019, Knight et al. 2004, Lane et al. 2010,
161 Nyhof and Johnson 2017). There is debate about the reasoning pattern that these younger
162 children use and whether they attribute their own knowledge state to others (egocentrism)
163 (e.g., Wimmer and Perner 1983), attribute the knowledge state of what a human would know
164 (anthropomorphism) (e.g., Lane et al. 2010), or attribute knowledge to all minds as a default
165 (preparedness) (e.g., Barrett et al. 2001). We explore 2-to-5-year-old children's responses on
166 these tasks to contribute to this debate.
167   With these three points in mind, we conducted two studies in three distinct cultures to
168 examine children's conceptualization of two different cognitive processes: perception and
169 memory. We compared children's responses regarding human and non-human minds in three
170 different cultures (the UK, Israel, and Albania) who have distinct religious backgrounds
171 (Christian, Modern Orthodox Jewish, and Muslim/Atheist, respectively). This comparison is
172 important because although all three traditions believe in an omnipotent, omniscient,
173 omnipresent being, the ways in which God is talked about greatly differs (see Methods).
174 Albania in particular provides an important non-WEIRD (Western, Educated, Industrialized,
175 Rich and Democratic) sample that helps to address a widespread problematic sampling bias
176 (Henrich, Heine, and Norenzayan 2010, Nielsen et al. 2017). We chose these locations
177 because of the strong religious adherence within each of these communities (see Methods for
178 particulars about each country)[1] and actively recruited children based on their religious
179 background.
180   To address when children differentiate human and non-human minds, we also asked
181 about a variety of different minds: animal minds that have sharp perceptual abilities, human
182 minds with particularly exceptional memory capabilities, as well as, God, and other human
183 minds.
184   For both studies and consistent with prior work on children's understanding of human
185 minds (Kiessling and Perner 2014, Lane, Wellman, and Evans 2010, 2012, 2014, Richert et
186 al. 2016, Wellman et al. 2001), we predict that only older children would conceptualize
187 correctly the more limited minds (such as human and animal minds). However, we predicted
188 that children from Christian, Muslim and Jewish traditions, and who believe God to be an all-
189 knowing being would attribute to God exceptional perceptual and memory qualities. We also
190 predicted cultural differences in children's concepts of human minds and for God. Since God,
191 Ha-Shem, and Allah are the most high and omniscient God in the Christian, Jewish, and
192 Muslim traditions, respectively, and children were from religious families and backgrounds,
193 we predicted all children would develop a concept of God (that God can perceive and
194 remember well) in a similar pattern. However, the work of Richert and colleagues (2016)
195 suggests the alternative prediction that Jewish and Muslim children differentiate human and
196 God's mind earlier than Christian children, since their concept of God does not include Jesus
197 as a human figure of God. If cultural input influences response, British children may be more
198 likely to attribute ignorance to God than the Israeli or Muslim children, as a result of their
199 exposure to Jesus, who presumably is conceptualized as having human-like perceptual
200 limitations. Israeli children, who do not have this same cultural experience, would be less
201 likely to follow this pattern. In other words, the cultural knowledge of being familiar with

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[1] We recognize that comparing across nations may conflate national or regional traditions. However, we were interested to find children in communities where families were immersed in their tradition as well as these communities being open to discussing research with us. Because we knew of colleagues connected to Modern Orthodox Jewish communities in Jerusalem and to Muslim communities in Albania, these samples were convenient. As stated in the Methods, Modern Orthodox Jewish communities are noted for adherence to tradition but also their openness to modern culture. Albania is also noted for its current openness to other religions and culture after becoming a democratic country.

202 representations of God as Jesus and his operating in a human form may influence British
203 children to think anthropomorphically about God. Therefore, since conceptualizing
204 supernatural minds is predicated on the descriptions provided by cultural accounts, received
205 testimonies, and personal experiences of these unobservable minds, we might expect some
206 variation in children's responses about God's perception and memory across different
207 samples.
208   Finally, we were interested in comparing responses of human minds from the
209 different WEIRD and non-WEIRD countries represented. Prior work has not tested children
210 in Albania before so comparisons among countries is exploratory.

Study 1: Children's Understanding of Perceptual Abilities

212   Focusing on children's understanding of perception may be a fruitful component for
213 exploring children's ToM and how others acquire knowledge. Perceptual experience varies
214 according to individual differences in perceptual acuity (e.g., age, impairment). Taking
215 individual differences into account requires particular perspective-taking abilities. These
216 skills are important for particular social contexts where children may need to learn to adjust
217 their speaking volume or visual access in order to engage with disadvantaged perceivers. We
218 know very little about how children understand age-related perception.
219   A few studies to date have investigated children's understanding of perception with
220 human and extraordinary minds (Richert and Barrett 2005, Lane, Wellman, and Evans 2012,
221 2010, Barrett, Richert, and Driesenga 2001, Greenway et al. 2017). In one particular study,
222 Richert and Barrett (2005) asked 3- to 7-year-old children about three sensory modalities:
223 seeing, hearing, and smelling. After children acknowledged they could not see, smell, or hear
224 a stimulus (e.g., a tape player that played almost inaudible music, a drawing too distant to see
225 well), children were allowed to see, smell, or hear the respective stimulus and asked whether
226 two human minds, an animal with an extraordinary sense (e.g., a fox with special ears, a dog
227 with a good nose), or God would perceive the stimulus. The two youngest groups of children
228 attributed knowledge states to the exceptional minds (e.g., the special animal and God) above
229 chance but did not respond different from chance for the human minds. The older children
230 significantly differentiated among minds and attributed knowledge to the special animals and
231 God and ignorance to the human minds and non-special animals. Using similar tasks,
232 Greenway and colleagues (2017) did not reveal the stimulus to the children before asking
233 questions about minds' perception and found that younger children attributed similar
234 perception to all minds, but older children began to differentiate between minds with varying
235 abilities.
236   To further examine these ideas, children in the present study participated in two
237 perceptual ignorance tasks: a visual task where children had to look at a stimulus (a paper
238 with an inconspicuous pencil drawing of a flower) some distance away and also an auditory
239 task where children listened to a radio playing very soft music. Unlike Richert and Barrett
240 (2005) and similar to Greenway and colleagues (2017), children in this study did not view or
241 hear the stimulus before being asked the questions about the other minds to ensure that this
242 task would be an ignorance task (and not a false belief task, similar to the one described in
243 the introduction). Similar to Richert and Barrett (2005), we asked children to predict the
244 perspective of five minds: two human minds (their mother and a friend), God, and two
245 special animals (a dog that can hear really well but has terrible eyes and an eagle with
246 excellent eyes but terrible ears). God was included because, despite cultural differences in
247 the physical or biological nature of God, the theologies in Christianity, Islam, and Judaism
248 regard God as all-powerful and knowledgeable. Thus, God is likely to know the picture on
249 the wall or what music is playing, even if a human cannot see the picture or hear the music.
250 By contrasting minds that possess different perceptual constraints and abilities, we hoped to

251 explore how children take into consideration these differences in perceptual perspective
252 taking.

<div align="center">**Methods**</div>

Participants

255   The entire sample consisted of 202 children. However, several children (*n* = 10) were
256 excluded from analyses based on shyness and inattentiveness..

257   **Albania**. Sixty children were from Albania (2:11 to 5:10; *M* = 4.68, *SD* = .68).
258 Children were recruited via advertisements from a local water park, local mosques, and a
259 local school. Two children were excluded because of shyness. The study was conducted in
260 children's homes or in a quiet place in a school. All children were Muslim and attended the
261 local mosque anywhere from multiple times a week to a month. Families were from a
262 community where income according to European standards are low (World Bank2019).
263 Families had high school level education. All children spoke Albanian (Gheg dialect).
264 Albania was chosen because, following the fall of communism in the 1990's, Albania made a
265 commitment to recognize religious belief and practice (Papagjoni 2017). This has created
266 openness and respect for religious communities. Over half (58%) of the country is Muslim
267 (World Population Review2019) and the community we had access to were open to having
268 researchers come to do research.

269   **Israel**. Sixty-six children (2:10 to 5:6; *M* = 4.26, *SD* = .87) were Modern Orthodox
270 Jewish children from Jerusalem, Israel. Three children (two 4-year-olds and one 3-three-year-
271 old) were excluded from analyses because they were not able to finish the task because of
272 inattentiveness. Children were recruited via advertisements from local synagogues. The
273 studies took place in children's homes or in a quiet location at a school. All children were
274 from practicing Modern Orthodox Jewish families who attended Shabbat services once a
275 week. Parents of children were highly educated with one parent having at least an
276 undergraduate degree, middle incomes, and spoke Hebrew or English. The study was
277 conducted either in English or Hebrew, whichever the language was most comfortable for the
278 child. All interview protocols were back translated and if a child was more comfortable
279 conversing in Hebrew, a native Hebrew speaker carried out the study. Modern Orthodox
280 Jewish communities in particular adhere to tradition but are open to modern culture.
281 Jerusalem has one of the world's largest urban Jewish populations with community life
282 centered around Jewish practices.

283   **United Kingdom**. Seventy-six children were from the UK (2:8 to 5:11; *M* = 4.31, *SD*
284 = .89). Five children (two 4-year-olds and three 3-three-year-olds) were excluded because
285 they were not able to sustain attention to answer all of the questions. Children were recruited
286 via advertisements from local nurseries, churches, and playgroups attached to churches in the
287 midlands of England and the Southeast of Scotland. Studies were conducted in children's
288 homes or in a quiet location at a school. Most children were from Protestant homes and
289 attended church at least once a week. Five British children came from atheist backgrounds
290 and the parents of nine children chose not to comment on their religious background. Parents
291 of children were highly educated (with one parent possessing a graduate degree), with
292 middle-to-high incomes, and all spoke English.

Materials

294   Five agents were targets for these tasks: an eagle, a dog, Mom, a friend, and God.
295 Two stuffed toys, a plush bald eagle and a plush dog, were used to represent the animals. For
296 the visual task, an A4 white piece of paper with a faintly drawn picture of a flower in the
297 center of the paper was used. A small battery-operated hand-held radio was used for the
298 auditory task.

Procedure

Children were interviewed individually and parents or teachers were present in the room. Parents were instructed not to prompt children's responses. Agents and sensory tasks were counterbalanced during questioning. Before beginning the tasks, children were asked to describe God and to tell the experimenter who God is. This description helped the experimenter know whether or not the child had heard of God previously. Of the 14 British children who were non-affiliated or atheist, all could mention something relevant about God, such as, "God answers prayers," or "God lives in my heart." Most children were from families who affiliated themselves with the Church of England. Nevertheless, all children were asked to tell the experimenter something about God to ensure that they knew the referent of "God." All Israeli children were from the Modern Orthodox community and mentioned something relevant to God: "God is everywhere," or "God knows everything." All Albanian children were Muslim, believed in Allah, and could say something relevant, such as, "Allah answers prayers," or "He is everywhere."

Audition task

Children were shown a small radio. Children watched as the experimenter held the radio and turned the radio on. No sound was audible. Participants were asked whether they could hear music. If they said "yes," further questions were asked until children admitted they could not hear any music. Only a few children across the different samples answered, "yes" (n =15). Children were told it was not a guessing game but that the researcher was really interested if they could hear and it was ok if they could not hear or not. Children were again asked if they could hear and children admitted they could not hear. In order to test which reasoning bias children use, it was essential that children acknowledged that they were ignorant. The task proceeded when the answer was "no." Next, the experimenter placed the plush eagle and dog next to the child. At the beginning of the task, children were instructed that, "eagles have good eyes and can see really far but do not have good ears and cannot hear well," and that "dogs have good ears and can hear really well but do not have good eyes and cannot see very far." Children were then asked, "Do you think [agent] can hear the music?" We introduced plush toys to help children understand these instructions and visualize the acuity of the eagle eyes and dog ears by being able to point to them. These extra instructions were added for the animals so that all children knew about the special abilities of these animals. The experimenter asked children to reason about an eagle, dog, Mom, a friend, and God in counterbalanced order.

Vision task

Each child watched while an experimenter put up a picture on a far wall. The experimenter told the child that he or she had drawn something on the piece of paper and asked the child whether he or she could see the picture. If the child said "yes," further questions were asked until she or he admitted not seeing the picture. The task proceeded once the answer was "no." Next, the experimenter placed a stuffed eagle and dog next to the participant. Children were asked, "Do you think [mind] can see the picture?" Children were asked to reason about the same minds: an eagle, dog, Mom, a friend, and God.

Results

Three age groups were created. See Table 1 for the breakdown of age groups by sample.

Table 1. Age group, *N*, and Gender for each sample

Population	*N*	Gender	Age Groups				
			Group	*N*	Range	*M*	*SD*
Albania	60		Young	10	3:0 – 3:11	3.54	.31

		42	Middle	24	4:0 – 4:11	4.56	.32
		Females	Older	26	5:0 – 5:10	5.31	.31
Israel	66	39	Young	24	2:11 – 3:11	3.27	.32
		Females	Middle	18	4:0 – 4:11	4.11	.27
			Older	24	5:0 – 6:0	5.27	.34
United Kingdom	76	33	Young	30	2:7 – 3:10	3.38	.32
		Females	Middle	24	4:0 – 4:11	4.40	.29
			Older	22	5:0 – 5:11	5.41	.31

346

347 Analyses were conducted to explore whether children attributed perception more often than
348 ignorance for each of the special animals. A score of 1 was given if children attributed
349 perception to that agent. The correct score for God would be a score of 2, as God should
350 perceive both stimuli accurately. A correct score for a human would be 0, as human
351 perception is limited and they should not be able to see or hear the stimuli. If an agent
352 received an overall score of 1, a child attributed perception to the agent for either hearing or
353 seeing the stimulus but not the other.

354   A repeated measures ANOVA with each agent (5: Eagle, Dog, Best Friend, Mom, and
355 God) as the within-subject factor and Age (3: 3-, 4-, and 5-year-olds) and Sample (3: Albania,
356 Israel and UK) as the between-subject factors was conducted to measure children's
357 attributions of knowledge via perceptual ability. The assumption of sphericity was violated,
358 so values using the Greenhouse-Geisser correction have been reported. This test revealed a
359 significant main effect for agent, $F(3.45, 573.07) = 126.79$, $p < .001$, $\eta_p^2 = .43$, Greenhouse-
360 Geisser adjusted. Analyses also revealed significant two-way interactions of agent and
361 sample, $F(6.91, 573.07) = 2.59$, $p < .001$, $\eta_p^2 = .07$, Greenhouse-Geisser adjusted; and agent
362 and age, $F(6.91, 573.07) = 6.45$, $p < .001$, $\eta_p^2 = .7$, Greenhouse-Geisser adjusted. There was
363 no three-way interaction, $p = .123$.
364   To explore the interaction effect of sample and mind, planned comparisons with a
365 Bonferroni adjustment were conducted. Israeli and British children followed the same trend.
366 British and Israeli children responded that the animals and God would perceive the stimulus
367 and the human minds would not. Responses from Albanian children compared to British
368 children were significantly different for all agents ($ps < .007$), except for responses about
369 their best friend and for God. Albanian responses for the Dog and Eagle were significantly
370 different from Israeli children, $p < .001$. Albanian children typically underestimated all
371 agents' perceptual abilities compared to the other samples, with the exception of God's.
372   To explore the interaction effect of each age group and mind, further planned
373 comparisons with a Bonferroni adjustment were conducted. As predicted, all children tended
374 to attribute correct knowledge to God and the non-human animals, and these responses were
375 significantly different from responses of ignorance to each human mind, $ps < .007$. There
376 were no significant differences in responses between God and the non-human animals and
377 also between Best Friend and Mom for all age groups.

378

379 *Table 2.*

380 Number of children attributing incorrect and correct perception by each mind, cultural group, and
381 age group.

	Age Group		
	3 years	4 years	5 years
Mind (Sample)			

	I	I/C	C	M (SD)	I	I/C	C	M (SD)	I	I/C	C	M (SD)
Ordinary												
Mom (UK)	9	10	7	1.08 (.79)	5	7	10	.71 (.78)	2	5	14	.43 (.68)
Mom (Is)	11	2	9	1.09 (.97)	1	2	14	.24 (.56)	3	6	18	.44 (.71)
Mom (Al)	8	0	2	.40 (.84)	1	3	18	.18 (.39)	2	1	22	.06 (.25)
Friend (UK)	9	6	11	.92 (.89)	3	4	15	.48 (.75)	2	3	17	.29 (.64)
Friend (Is)	8	4	10	.91 (.92)	1	4	12	.35 (.61)	4	0	22	.32 (.75)
Friend (Al)	7	3	0	.30 (.48)	2	3	16	.35 (.70)	3	7	13	.38 (.50)
Extraordinary												
God (UK)	4	7	15	1.42 (.76)	3	5	14	1.52 (.68)	3	4	15	1.52 (.75)
God (Is)	5	8	9	1.18 (.79)	7	1	9	1.12 (.99)	1	1	23	1.88 (.44)
God (Al)	0	2	8	1.80 (.42)	2	0	19	1.76 (66)	1	1	21	1.81 (.54)
Eagle (UK)	0	12	14	1.54 (.51)	3	4	16	1.57 (.75)	0	5	17	1.76 (.44)
Eagle (Is)	1	11	10	1.41 (.59)	0	7	10	1.59 (.51)	0	10	17	1.60 (.50)
Eagle (Al)	3	6	1	.80 (.63)	2	15	3	1.18 (.39)	1	16	5	1.13 (.50)
Dog (UK)	1	10	15	1.54 (.58)	0	7	15	1.67 (.48)	0	5	17	1.72 (.46)
Dog (Is)	1	15	6	1.23 (.53)	0	11	6	1.36 (.49)	0	7	20	1.72 (.46)
Dog (Al)	1	7	2	1.10 (.57)	0	16	4	1.00 (.50)	2	15	5	1.06 (.57)

382 Notes. *I* = Incorrect. *I&C = 1 Incorrect and 1 Correct.* C = Correct knowledge attribution. Responses of
383 IDK, were not included in the analysis.

384

385   Discussion
386   Similar to Richert and Barrett (2005), Israeli and British children attributed perception
387 correctly to God and the animals. Albanian children, however, only attributed perception
388 only to God. Also, all age groups in each sample significantly attributed a lack of perceptual
389 abilities to Mom and their Best Friend.
390   Past research questioned whether children differentiate among minds, or whether
391 children just relate their own state of knowledge to other minds. Children in prior studies
392 (Yaniv and Shatz 1988, Richert and Barrett 2005) did not attribute correct knowledge and
393 ignorance to all minds until age five. Richert and Barrett (2005) gave children auditory and
394 visual perceptual perspective-taking tasks but revealed the stimuli, similar to a false belief
395 task. Instead, in the present study an ignorance task was used and Richert and Barett's (2005)
396 methods were adapted by using the same auditory and visual perspective-taking tasks but not
397 revealing the stimuli. Even though the experimental tasks differed, the results reported here
398 are consistent with those of Richert and Barrett (2005). Regardless of children's knowledge
399 or ignorance of the stimuli, children demonstrated they were able to suspend their own
400 ignorance to infer the knowledge state of other minds and to differentiate among different
401 minds.
402   These findings are in contrast to work that suggests that children need to understand
403 human limitations first before understanding other minds (Lane et al., 2012). As the results
404 indicate, by four years Israeli and British children showed a trend to respond that the two
405 animals had special faculties (sight, hearing). Given that children were asked to reason about
406 God's perceptual abilities, this type of question might bring to mind that God has ears or has
407 eyes. If it is the case that children picture God as human, children should anthropomorphize
408 their responses and respond that God cannot hear or see the stimulus. Even with these
409 potentially anthropomorphic cues, children of all ages resisted anthropomorphizing God and
410 this response differed from each child's own ignorant perspective.
411 **Exploring Sample Differences for the Animals**

Contrary to predictions, children in the British sample responded more consistently than the Israeli sample that the animals would be able to perceive the stimuli. Instead, the Albanian children tended to attribute both seeing and hearing abilities to the eagle and dog, instead of differentiating the different perceptual strengths of the animals (e.g., that dogs can hear better than they can see).While it is not entirely clear why the Albanian children attributed incorrect perceptual abilities, we suggest a possible explanation. Results show that the Albanian sample of three-year-olds was small ($n = 10$) and additionally the younger British group was slightly older ($M = 3.38$) than the youngest Israeli group ($M = 3.27$). Older children may have had an experiential advantage and/or a more developed ToM. Other possible explanations may include differential exposure to animals or cultural narratives about animals with exceptional abilities. A further consideration is that Albanian children were not familiar with puppets and they were confused by the representations of the fake eagle and dog in front of them. Had children responded with puppets in mind, however, their responses should have been of attributing limitation to perceptual ability. However, we not know whether children were more likely to attribute auditory and visual perception because of the wording of the question, the presence of the puppet eagle or dog, or that children genuinely did not know how to respond so applied perception to both animals. Therefore we are limited in understanding Albanian's children's conceptualization of animal perceptual abilities. Thus, to better understand these differences, future research will need to explore the influence of age at a microgenetic level, and potentially confounding factors such as the influence of pet ownership (dogs), understanding of wild animals (eagles) or other meaningful contact with animals and other cultural variables that impact children's understanding of agency, intention, and perceptual and knowledge attribution of animals.

Cross-culturally and cross-religiously, 3-to-5-year-olds differentiated among minds at an early age and took into consideration individual differences. Further research should explore other non-WEIRD religious and cultural traditions to verify this pattern of developmental acquisition of a theory of other minds. Additionally, the complex nature of understanding a variety of constraints in humans, animals, and gods with limiting constraints needs further exploration beyond just perceptual constraints. With this in mind, the next study explores children's understanding of the influence of age on memory in varying aged minds and minds with different abilities.

Study 2

In our second study we tested children in each of the three cultures on their ability to reason about the memory faculties of 6 different minds: God; Grandad (an old man); a Baby; Mom; Swec, "a person who remembers very well;" and Bop, "a person who does not remember well."

To our knowledge, only two studies have focused on children's understanding of ToM in relation to the age of the target (Farmer and Dowker 1995, Taylor, Cartwright, and Bowden 1991). In one study (Farmer and Dowker 1995), children aged 3- to 5-years-old watched three different versions of a traditional Sally-Ann task (taken from Wimmer and Perner 1983). In each version the age of the doll that leaves the room varied: 1) a doll of the same age as the child, 2) a baby doll, and 3) an adult male doll. Results revealed that children of all age groups were more likely to attribute false beliefs to the baby than to a peer, and more likely a peer than to an adult. Taylor and colleagues (1991) asked children to participate in a similar theory-of-mind task and reason about a baby, child, and adult, but children only responded correctly after four years of age.[2] These data reveal that children may have some expectations concerning the abilities and constraints of particular individuals, even before they have a mature or adult-like understanding of other minds. We predict that

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[2] However, Taylor et al. (1991) did not recruit three-year-olds.

460 children would attribute a poor memory to a Baby and Bop and a good memory to Swec and
461 God. Because an older person's memory (Grandad) and Mom's memory might be
462 individually variable, we made no predictions regarding children's reasoning for these minds.
463 The predictions for these two minds remain exploratory.
464
465 <center>**Methods**</center>
466 **Participants**
467   The same participants from Study 1 participated in Study 2. Both studies were
468 presented in a counterbalanced manner, with some children receiving Study 1 first and other
469 children Study 2 first. Some children did not respond for some agents, saying they did not
470 know. Their responses for the other agents were still included in all analyses.
471 **Materials**
472   Up to 10 7.5 x 7.5 cm cards were used for the memory task. Each card depicted a
473 farm animal, such as a cow, pig, or sheep. A 10 x 10 cm sized wind-up magnetic fishing
474 game was also used as a distractor task, see Procedure. Seven agents were targets for this
475 task: a dog, an old man (Grandad), a Baby, Mom, God, Swec, and Bop. A realistic Boston
476 Terrier stuffed dog (approximately life-sized), a 70 cm long Grandad puppet, and a 40 cm
477 long baby doll were used to represent a dog, an older male, and a baby, respectively. No
478 puppets were used to represent Mom, God, Swec, or Bop.
479 **Procedure**
480   British, Israeli, and Albanian children were interviewed individually. The order of
481 presentation for each mind was counterbalanced during questioning.
482   Participants were shown four farm animal cards to begin and told to try and remember
483 where each animal was placed. The cards were turned over and children moved to the side of
484 the table where they were given a distraction task, a wind-up fishing game. Participants were
485 instructed to catch as many fish as they could before the wind-up mechanism stopped. This
486 distraction task took five minutes. When the game finished the experimenter directed the
487 participant's attention back to the turned over farm animal cards and asked the participant if
488 he or she could point to a target card (e.g., the cow). Targets were counterbalanced among
489 the four available farm animal cards. If the participant remembered the target card correctly,
490 the above procedure was repeated, adding two more cards each time, until the participant
491 responded incorrectly.
492   Children played the memory game until they could no longer remember the location
493 of a target card. This ensured that each child had a relevant experience of "forgetting."
494 Children were then asked if various agents would recall where the correct card was located.
495 Different agents were used to represent different types of minds. Different aged puppets
496 (e.g., a baby and granddad puppet) were used to portray minds of differing age. Two
497 imaginary minds were also used: "a person who does not remember well," called Bop, and
498 "a person who remembers really well," called Swec. These minds were used to test children's
499 understanding of age-related memory differences. If children understood "forget" correctly,
500 they should correctly respond that Bop would not remember the location of the card. If
501 children understood "remember" correctly, they should also respond that Swec would
502 remember the location of the card. A dog puppet was also added to the range of minds to test
503 children's understanding of memory in "dumb" or constrained minds. The Mom and God
504 minds were used to compare possible similarities or differences with past work (Barrett et al.
505 2001, Lane et al. 2012, 2014). To avoid prompting anthropomorphic thinking, no picture was
506 given of God, so likewise no picture was given for Mom, Swec, or Bop.

Results
Children's Responses on a "Forgetting" Task

507
508

509   For the final round of the game in which the child forgot the location of the card (i.e.,
510 the game in which the child had an experience of forgetting), answers were coded as 0 for
511 "yes" responses (e.g. "yes, [mind] remembers the location of the card") and a 1 for "no"
512 responses (e.g. "no, [mind] does not remember the location of the card"). Across all ages,
513 children responded that God (84.7%, $n = 171$), Swec (84.2%, $n = 170$), and Mom (67.3%, $n =$
514 171), would remember the location of the card, see Table 3. Moreover, children also
515 attributed forgetting to Bop (72.8%, $n = 147$). Just half of children responded that Grandad
516 (58.4%, $n = 91$), Dog (51.5%, $n = 104$) and a Baby (58.4%, $n = 118$) would forget. There
517 were a large proportion of children that responded "I don't know" for Dog (13.4%, $n = 27$),
518 Baby (13.4%, $n = 27$), Grandad (12.9%, $n = 26$), Mom (5%, $n = 10$), and God (2%, $n = 4$).

519

520 *Table 3.*

521 Number of children attributing memory recall by each mind, cultural group, and age group.

| | Age Group | | | | | |
| | 3 years | | 4 years | | 5 years | |
Mind (Sample)	*No Rec*	*Rec*	*No Rec*	*Rec*	*No Rec*	*Rec*
Ordinary						
Baby (UK)	15	9	11	7	18	6
Baby (Is)	12	15	13	11	19	3
Baby (Al)	4	2	12	1	14	3
Mom (UK)	12	12	10	8	9	13
Mom (Is)	6	24	6	17	9	13
Mom (Al)	0	8	2	22	2	19
Grandad (UK)	15	9	9	7	11	13
Grandad (Is)	9	18	12	12	13	9
Grandad (Al)	3	3	10	5	9	9
Dog (UK)	17	7	14	4	15	9
Dog (Is)	9	18	11	13	17	5
Dog (Al)	1	4	10	15	10	6
Bop (UK)	17	7	14	4	23	1
Bop (Is)	12	16	22	2	20	2
Bop (Al)	6	3	16	5	17	6
Extraordinary						
God (UK)	8	16	5	13	1	23
God (Is)	4	26	4	20	3	19
God (Al)	1	9	2	19	0	23
Swec (UK)	10	14	5	13	0	24
Swec (Is)	4	24	3	21	1	21
Swec (Al)	3	6	1	22	1	25

522 Notes. *Rec* = Recall. *No Rec = No Recall.* Responses of IDK, were not included in the analysis.

523 **Age and Cultural Differences**
524   To examine whether responses differed by cultural sample, we used binary logistic
525 regressions and used dummy-codes for sample. Bonferonni adjustments of $p < .002$ (α of .05
526 divided by 7 separate analyses for 7 minds and divided by 3 samples) were applied.

527   Analyses demonstrated that Age was a significant predictor for Baby, Bop, Swec, see
528 Table 3. With age, children were 1.74 – 2.55 times more likely attribute no recall to Baby and
529 Bob, and unlikely to attribute no recall to Swec. Age was not a significant predictor for Dog,
530 Grandad, God, and Mom. Children across all ages and samples showed inconsistent
531 responses regarding Mom, Dog, or Grandad. On the other hand, children attributed consistent
532 recall to God, thus responses did not change with age or by sample. We discuss these results
533 below.
534   The only cross-cultural difference was between Albanian and Israeli children's
535 responses regarding Mom. Israeli children were 12.6 times more likely to attribute better
536 recall of memory to Mom than Albania children, see Table 3.
537 *Table 3.*

538 Individual logistic regressions examining age as a predictor for attributing knowledge or ignorance to
539 each mind by sample.

	B	Wald	*p*	Exp(B)
Dog				
Age	.551	8.061	.005	1.735
UK vs Albania	.057	12.09	.894	1.059
UK vs Israel	.885	5.798	.016	2.432
Albania vs Israel	.828	3.268	.071	2.289
Baby				
Age	.712	12.249	**.0001**	2.038
UK vs Albania	.936	3.180	.075	2.549
UK vs Israel	.344	.863	.353	1.411
Albania vs Israel	-.592	1.206	.272	.553
Grandad				
Age	.081	.208	.648	1.085
UK vs Albania	-.360	.785	.376	.698
UK vs Israel	.332	.930	.335	1.394
Albania vs Israel	-.028	.005	.946	.972
Mom				
Age	.178	.802	.371	1.195
UK vs Albania	-1.633	7.761	.005	.195
UK vs Israel	.900	6.223	.013	2.459
Albania vs Israel	2.532	18.608	.0001	12.583
God				
Age	-.552	4.654	.031	.576
UK vs Albania	1.295	2.608	.106	3.650
UK vs Israel	.468	1.076	.300	1.597
Albania vs Israel	1.763	4.654	.031	.576
Bop				
Age	.937	16.520	.0001	2.553
UK vs Albania	-.414	.860	.354	.661
UK vs Israel	.596	1.863	.172	1.814
Albania vs Israel	1.010	4.198	.040	2.745
Swec				
Age	-1.054	13.791	.0001	.348
UK vs Albania	-.299	.218	.640	.741
UK vs Israel	.953	3.615	.057	2.595

	Albania vs Israel	.654	3.299	.069	10.849

540 + Note. These individual logistic regression analyses are not significant because they are subject to family-wise
541 error (Bonferroni-adjusted *p*-values for God and ordinary minds = .002, and for other extraordinary minds =
542 .01).

543
Discussion
545   The purpose of Study 2 was to explore children's responses on a memory task.
546 Children did not egocentrically apply their own forgetfulness to God or the other minds.
547 Children treated the minds differently. Israeli, Albanian, and British children attributed God
548 with a good memory across all age groups. Older children in all groups consistently
549 responded that Swec would recall the items in the task. Responses for Baby's and Bop's
550 recall improved with age, such that older children understood that Baby and Bop would find
551 the memory task difficult. Responses for Mom, Dog, and Grandad were much more variable
552 in children's response patterns.
553   Results from both samples confirmed that preschoolers are able to consider various
554 memory constraints and capacities of other minds before age five, even when they could not
555 remember the target card in the task themselves. Whether children's responses were
556 anthropomorphic is unclear as responses for the human minds showed so much variation.
557 However, a few things are noteworthy based on the pattern of data. If children were using an
558 anthropomorphic framework, responses would be the same amongst all human minds.
559 Indeed, there is the possibility that three-year-olds used a human model (a less strict form of
560 anthropomorphism) for some of the minds. For example, it is possible that children's
561 understanding of Baby formed their understanding about thinking of the mind of a Dog and
562 that their understanding of Mom formed their understanding about thinking of the mind of
563 God. Nevertheless, there is little evidence for such an interpretation. The pattern that
564 emerged is that with development across age, children began to understand the limitations
565 that a baby and dog might have in completing the memory task. By five years, children
566 consistently responded that both of these agents would do poorly on this task. Similar to
567 Study 1, there were some cross-cultural differences in Study 2. Albanian children were less
568 likely to attribute good memories to minds compared to other British and Israeli children. It
569 could be that Albanian children have less experience with animals than Israeli or British
570 children. Albanian children in this sample did not have pets and lived in a city. However,
571 they attributed less memory ability to all minds. This could reflect genuine negative
572 perceptions of another's memory capacity.
573   Interestingly, half of children responded that Mom and Grandad would remember.
574 The variation in responses for these agent may reflect children's experiences with their own
575 mothers and elderly people. Results could reflect a group of children who honestly stated
576 their grandfather's or mother's ability to remember. Another possible explanation is that
577 responses reflect differential experience with older persons. More experience may be
578 potentially related to better understanding of an elder person's abilities. Yet, even so, the
579 variability of the memory faculties of the elderly can vary widely. Or, perhaps the type rather
580 than amount of personal experience is key. One child may have a granddad or mom who is
581 very clever and another child may have one with a poor aptitude for memory. Justifications
582 of these responses would be helpful in determining which type of experience or intuition
583 children consider. Finally, the inconsistency with which children responded for Grandad and
584 Mom may demonstrate that people are not sure about the memory capacities of an individual
585 or someone old in age. Indeed, older individuals may be wise but also forgetful. The design
586 of the memory task allows for variation in responses for some of the human minds, such as
587 Granddad or Mom. Unlike other theory-of-mind tasks, there were no correct answers for

588 minds like Mom or Granddad. This ambiguity may have forced participants to think about
589 the individual differences and capacities of these individuals in order to assess whether this
590 mind can be attributed with a good memory or not. Because 5-year-olds attributed memory
591 recall so clearly and consistently for God and Swec, and attributed lack of recall to the Baby
592 and Bop, the most likely explanation for the unclear responses for Mom and Grandad is that
593 children may be drawing on their own personal relationships and these personal figures may
594 reflect varied individual differences in memory recall ability.
595   Children of all ages attributed a good memory to God and with age, all children
596 attributed good recall to Swec. This difference, that children attributed God with good recall
597 at all ages but that children attributed good recall to Swec with age, is suggestive that the
598 process of conceptualization and understanding of the cognitive abilities of these two
599 supernatural agents may be different. God is an agent the children in each of the samples had
600 heard of before whereas Swec was a novel supernatural agent that they had never
601 encountered. In prior work using a knowledge ignorance task (Burdett et al, 2019), children
602 attributed knowledge to God and other supernatural agents with ease. As noted above,
603 perhaps assessing a novel or unfamiliar agent's capacity for memory recall is not as easy or
604 clear as assessing knowledge acquisition. In false-belief paradigms one assesses whether
605 another has acquired correct knowledge or not and here we are assessing memory
606 capabilities. The latter may require more familiarity or knowledge of the agent in question.
607   Even though children attributed Swec with better memory with age, children
608 consistently attributed good recall to God. Compared to work that suggests that children form
609 human concepts first (Lane et al. 2012), these results suggest that children applied different
610 abilities to God than they did to human agents. This result is striking because children came
611 from a standpoint of "forgetfulness" and were still able to consider a different viewpoint, that
612 God would recall the location of a card.

General Discussion

613
614   We originally included these three samples with three separate religious traditions to
615 examine whether three very different cultural experiences would influence children's
616 developing concepts of God and other minds. Albania is also a non-WEIRD sample,
617 enabling an exploration of possible differences in ToM development with children there.
618 Across both studies, we found that Albanian children responded differently about the human
619 and animal minds from the Israeli and British children, often responding inconsistently.
620 However, there were no significant differences in responses for God across all samples.
621   Similar to prior work (Lillard 1998, Shahaeian et al. 2014, Tardif, Wellman, and
622 Cheung, 2004, Wellman et al. 2001) and according to our predictions, we found age and
623 cultural differences among children's attributions of knowledge of human and animal minds.
624 Albanian children show more inconsistent responses compared to Israeli and British children,
625 however similar trends were found for older children across all samples in that they were
626 much more consistent in their responses than younger children. Below we first discuss
627 cultural differences and then discuss the similar trajectory of ToM development across
628 cultures.
629   An increasing amount of work is demonstrating variation in ToM development
630 (Lillard 1998, Shahaeian et al. 2014, Tardif, Wellman, and Cheung 2004, Wellman et al.
631 2001). These studies show that key sociocultural factors and experiences may influence the
632 timetable for which children acquire different concepts (e.g., knowledge access, belief-
633 desires) of mind. Some work demonstrates differences according to large group factors. For
634 example, more individualistic cultures such as in the USA, Turkey, and Australia, where
635 there are cultural values of developing one's own identity, tend to develop understanding that
636 their belief and desires can be separate from other's beliefs and desires early (Etel and
637 Yagmurla 2015, Shahaeian et al. 2006, Shahaeian et al. 2011, Wellman et al. 2006). And, in

638 more collectivistic societies where there is some importance for understanding of where
639 knowledge comes from, such as Iran, China and Pakistan, children develop knowledge access
640 much earlier (Nawas, Hanif, and Lewis 2015, Shahaeian et al. 2011, 2014, Wellman et al.
641 2006).
642   This may explain part of the differences between the UK, Israel and Albania. Albania
643 is transitioning from a communist to democratic nation, therefore it is possible that in this
644 transition individualist cultural values may not be prominent or highly valued as other
645 established democratic societies.
646   Another potential group factor is national or local religion. Some work suggests that
647 cultures who are predominantly Catholic are more prone to anthropomorphism because
648 practices and belief rely on physical and tangible forms and representations of Jesus Christ
649 (Epley, Waytz, and Cacioppo 2007). Or, in Muslim localities, where God is not in physical
650 form nor tangible, children and adults are less prone to anthropomorphize (Nyhof and
651 Johnson 2017, Richert et al. 2016). We also made several predictions about children's
652 attributions of knowledge to God according to religious tradition. Unlike Richert and
653 colleagues (2016), we did not find that Muslim children performed better on these tasks.
654 Instead we found that children in all three traditions performed well, and attributed memory
655 and perception to God. This supports claims that children may develop better
656 conceptualizations of God who are raised in practicing and believing households (Lane et al.
657 2012, Richert et al. 2016).
658   While large group factors play a role, we note that further exploration is needed
659 regarding small and local group factors. A growing body of work is demonstrating that social
660 relationship and environments shape theory of mind performance, such as family size
661 (Devine and Hughes 2018), number of siblings (Coles and Mitchell 2000,; Perner et al.
662 1994), the amount of mental-state talk in the home (Hughes, Devine, and Wang 2017; Liu et
663 at. 2016), and family background (Cutting and Dunn 1999). For example, a recent study
664 showed correlations between a child's ToM performance and their parent's tendency to see
665 their children as mental agents (Hughes et al. 2017).
666   Additionally, a growing body of work is showing that children's understanding of
667 supernatural minds shows variation across cultures (Burdett, Wigger, and Barrett 2019).
668 Similar to the work for children's understanding of human minds, further work is needed to
669 understand the variation in supernatural minds, such as accounting for family dynamics,
670 frequency of witnessing or participating in rituals, religious participation, parenting
671 philosophy, and how parents conceptualize and talk about supernatural agents in
672 conversations or via prayer. Some of the most compelling research that is exploring the
673 influence of social-ecology is from Richert and colleagues (2017), who has shown that
674 children's ability to differentiate a human and God's mind is predicted by their parent's
675 tendency to anthropomorphize, and that Muslim children clearly differentiated betwen human
676 and God's mind much better than children growing up in Chrisitan or non-religious
677 households.
678   We suggest that children do not develop an understanding of human minds simply
679 just by maturational processes (Leslie, 1994) or simulation (Harris, 1991). Additionally, we
680 also suggest that children do not develop an understanding of supernatural minds *solely* by
681 default (Barrett et al. 2001, Knight 2008, Knight et al. 2004, Nyhof and Johnson 2017,
682 Wigger et al. 2013), via egocentrism (Makris and Pnevmatikos 2007), or via
683 anthropomorphism (Lane et al. 2012, 2014). Instead, we suggest that there is an interaction
684 between cognitive and cultural processes (Kline, Shamsudheen, and Broesch 2018, Legare
685 2017, Nielsen et al. 2017, Willard and McNamara 2019), based on increasing cross-cultural
686 and intra-cultural evidence, that children are influenced by their social relationships and
687 environments and that this shapes the rate and trajectory of their conception and

688 understanding of different minds (Burdett et al. 2019, Richert et al. 2017). Thus, young
689 children find omniscient agents they are familir with easy to conceptualize, and do not need
690 to do this by egocentrism (as children were themselves ignorant), by anthropomorphism
691 (children showed more consistent responses for God than other familiar agents), or do this by
692 default (children did not consistently respond regarding Swec). Thus, cultural exposure
693 combined with knowing the all-powerful abilities of supernatural agents may aid children in
694 reasoning and conceptualizing certain types of supernatural minds.
695   Further work is required to more precisely identify the degree to which local
696 ecologies and intra-cultural input influence children's conceptions of other humans, animals
697 with varying capabilities, and supernatural beings. Though the present study identified a
698 developmental pattern across three cultures, future studies may more precisely examine the
699 degree to which a child's community and family influences these conceptions. For example,
700 the recent work by Richert and colleagues (2016) is just beginning to highlight that parental
701 beliefs and perceptions influence children developing concepts of God.
702   The above evidence suggests that there is relative uniformity in that young children in
703 many different traditions and backgrounds are able to represent God's mind. Further work is
704 required to examine how children reason about other types of God(s), such as those found in
705 non-monotheistic traditions. We know to some extent that children treat non-omniscient
706 supernatural agents differently from omniscient ones (Burdett et al., 2019; Knight et al.,
707 2004, Moriguchi, et al., 2019) but we do not know whether children from Hindu, Buddhist or
708 other religious backgrounds that are not predominantly Christian, Jewish or Muslim, would
709 differentiate in the same way. We suspect that children will likely be able to differentiate
710 omniscient supernatural agents from other more limited agents but that this differentiation is
711 much more prominent in children who have had interactions or exposure to omniscient
712 supernatural agents before.
713   In conclusion, the present study included samples from three different cultures with
714 different religious traditions. Despite different cultural experiences, a common developmental
715 pattern was observed. This pattern may suggest the presence of an underlying cognitive
716 architecture that may lay the framework for development or more likely, that children raised
717 in religious traditions with an all-powerful God, develop similar rich understandings of God.
718 With this in mind further work is needed to explore the degree to which local cultures and
719 different religious traditions affect early concept development of supernatural minds.
720
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