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Children's attributions of beliefs to humans and God: cross-cultural evidence

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Abstract

The capacity to attribute beliefs to others in order to understand action is one of the mainstays of human cognition. Yet it is debatable whether children attribute beliefs in the same way to all agents. In this paper, we present the results of a false-belief task concerning humans and God run with a sample of Maya children aged 4–7, and place them in the context of several psychological theories of cognitive development. Children were found to attribute beliefs in different ways to humans and God. The evidence also speaks to the debate concerning the universality and uniformity of the development of folk-psychological reasoning.

Keywords: False-belief tasks; God; Religion; Theory of mind; Yukatek Maya

1. Introduction

Humans routinely attribute intentions, beliefs, and desires in order to interpret the behavior of others. Other humans are seen as agents, that is, as entities that pursue goals in accordance with their beliefs and desires. Attributions of agency are so ubiquitous that they are typically taken for granted in everyday life. These attributions are not always correct in identifying the beliefs and desires that underlie a specific action of an agent; yet, if people did not see others

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as agents, the capacity to understand their behavior would be severely impaired (for example, people would be surprised when others got up and moved).

Abundant research documents children's acquisition of human agent concepts over the first several years of life (Astington, Harris, & Olson, 1988; Perner, 1991; Wellman, 1990), but there is little work available on the development of non-human agent concepts. Yet, people often attribute intentions, beliefs, and desires to animals as well as to ghosts, gods, demons, and monsters. Scholars have long assumed that children first acquire concepts of human agency and then use them as templates to understand all non-human agents. One exception in this regard is found in the work of Barrett and coworkers (Barrett, Richert, & Driesenga, 2001; Richert & Barrett, 2004; see also Atran, 2002, for an evolutionary account of why children cognize non-human agency).

In this article, we offer further support for Barrett's point of view, showing that Yukatek children do not reason in the same way about the agency of humans and God since early on in development. In the first part, we discuss the development of human agent concepts, specifically with regard to the false-belief task. Then, we outline the predictions implied by several theoretical positions concerning the development of children's understanding of humans' and God's beliefs. After that, we present experimental evidence from a Yukatek Maya sample that supports the hypothesis that young children do not reason about God's beliefs in human terms. Finally, we discuss the theoretical positions and their predictions in light of the results and place the evidence in the larger context of theory of mind research.

2. The development of human agent concepts

The cognitive literature on child development usually distinguishes three phases in the development of understanding of agency (see for example, Csibra, Gergely, Biró, Koós, & Brockbank, 1999; Gergely, Nádasdy, Csibra, & Biró, 1995; Gopnik & Meltzoff, 1997; Wellman, 1990). During the first year or so, children are believed to apply a principle of rational action, that is, they begin to appreciate that humans do not merely propel themselves, but do so in purposeful and rational ways. By the second or third year, children incorporate simple mentalistic attributions into this rational principle: the purposeful and rational action is understood to be driven by desires. Finally, during the fourth or fifth year, the principle of rational action is coupled with representational attributions: agents are seen as pursuing goals in accordance to their *beliefs*.

The emergence of this representational stage, which is a necessary condition for the possession of a full-fledged conception of the mind, is the most relevant to the arguments and experimental results presented in this article. Exactly when this transition takes place has been a matter of considerable debate generating an abundance of research (e.g., Astington et al., 1988; Carruthers & Smith, 1996; Whiten, 1991). Although some evidence has emerged for the presence of representational reasoning in 3-year olds (Chandler, Fritz, & Hala, 1989; Hala, Chandler, & Fritz, 1991; Lewis & Osbourne, 1990; Siegal & Beattie, 1991), the bulk of the data available suggests that this ability is neither stable nor robust until children are 5 or older (Flavell, Flavell, Green, & Moses, 1990; Perner, Leekam, & Wimmer, 1987; Wellman & Bartsch, 1988; Wellman & Wooley, 1990; Wimmer & Perner, 1983).

Since Premack and Woodruff (1978) started experimenting with non-human primates in order to establish the possibility that they had a 'theory of mind,' different ways of testing for this have been designed and tried out. As Dennett (1978) pointed out, you can credit an entity with a conception of belief only if there is evidence that it is able to understand that others may entertain false beliefs. Therefore, to probe children's representational understanding of agency—whether they have a conception of belief—it is necessary to ascertain that they figure out that people can have false beliefs and that these *beliefs* can motivate behavior.

A variety of false-belief tasks have been developed in the last 20 years to test children's understanding of beliefs. One such experiment is known as the 'Sally-Ann' test (Wimmer & Perner, 1983). In this test, the child is made to look at a scene in which two dolls are animated by experimenters. The dolls are used to represent human beings—Wellman, Cross, and Watson (2001) have shown in a meta-analysis of false-belief studies that using a doll as a proxy for an actual human being does not affect the outcome of the experiment. The two dolls enter the stage; one of them (Sally) places an object in one of two containers and leaves the room. While Sally is out, the second doll (Ann) moves the object into the second container. Sally re-enters the stage; at that point, children are asked where Sally, who is unaware that the switch took place, will look for the object. Children, therefore, are asked to infer whether Sally will act according to her false belief (that the object is still in the original container) or not.

Another false-belief task, the one used in the experiments that will be presented later, is known as the 'surprising contents' task. In it, children are shown a closed container (usually a cracker box with a conspicuous picture of its contents on the outside) and asked what they believe is in it. The experimenter then opens the box to reveal that the crackers have been removed, and that small rocks (or a similarly unexpected item) have been put in their place. After reclosing the box, the experimenter checks that the children are still clear on what the box contains. The experimenter then introduces a doll who has not seen the inside of the box, and asks what the doll would think is in the container. Again, the point of the experiment is to establish whether children are capable of figuring out that other agents may have false beliefs and act accordingly.

3. The development of God concepts

By and large the research pertaining to children's understanding of agent concepts deals exclusively with *human* agent concepts: how children's concepts of human agency become increasingly specialized. In false-belief tasks, as well as in most other studies of children's understanding of agency, experimenters have asked children to reason about human actions, beliefs, desires, and emotions. Very little available research addresses the generalizability of children's understanding of agency to non-human agents in general, and to God in particular. However, by looking at the assumptions of several theoretical positions, we can envisage their predictions concerning the understanding of God in comparison to humans in a false-belief task.

In Fig. 1, we offer a tree diagram to show how these positions are related to each other. The graphs outline predictions of false-belief task performance in relation to humans and God. To illustrate the graphs, consider a surprising contents task: suppose children are presented with

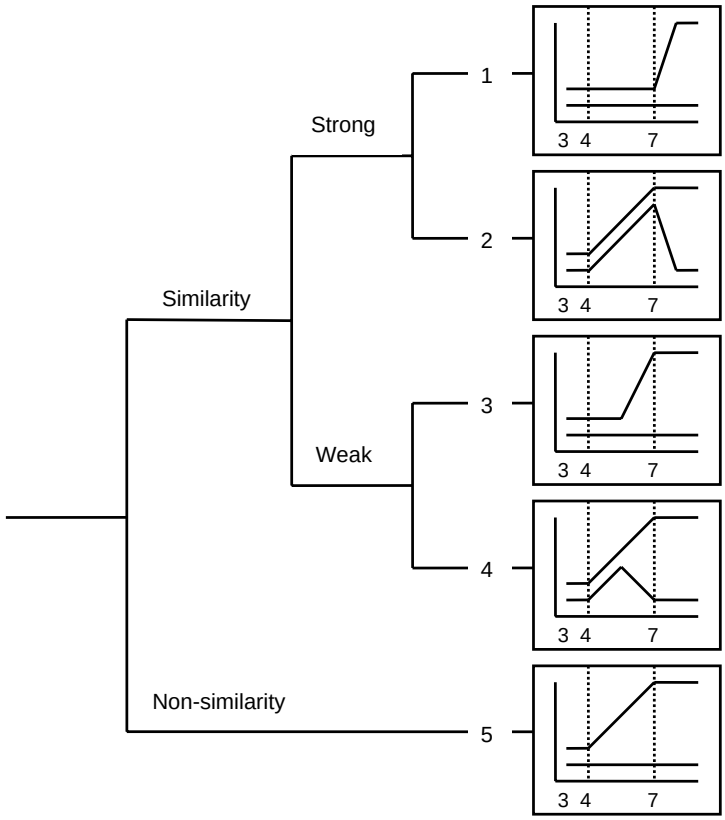

Fig. 1. Predictions of false-belief task performance.

a closed cracker box, shown that the box contains small rocks, and then asked what a human and God, who did not have a chance to look inside the box, would think is inside.

In all graphs, the top line represents attribution of beliefs to humans, and the bottom line represents attribution of belief to God. On the *Y*-axis, performance is mapped; the higher the line, the more likely it is that a child would attribute false beliefs to the agent in question—to say that a human or God would think that the box contains crackers. The *X*-axis shows the developmental time frame. As indicated by the dotted lines, the age range of 4–7 is the most relevant to our discussion, since it is then that children, according to the current literature, come to attribute false beliefs to human agents (see discussion in the previous section).

At the highest level of the tree, the opposition is between similarity and non-similarity perspectives with regard to the way beliefs are attributed to God and humans. From a non-similarity perspective, children would start to differentiate humans and God (attributing more false beliefs to humans than to God) from the very beginning of the developmental stage of our concern. From a similarity perspective, children would attribute either true beliefs or false beliefs to both humans and God *in equal measure, initially, and for at least some part* of this developmental time frame.

Similarity positions (graphs 1–4) postulate that children initially use humans (or some humans) as an analogical basis to understand God's beliefs. At the very least, we can distinguish two stances: a strong and a weak one. The strong stance is perhaps best represented in Piaget's work (1960). There are two possible interpretations of Piaget's understanding of the development of God concepts. In graph 1, an infallible parent (who is capable of knowing what is inside the box without having to see it) is used as the basis to understand God until quite late in development. At some point, children start to recognize that parents can entertain false beliefs but they do not transfer this characteristic to God, since at this same point they start to learn that God has special qualities such as omniscience. For example, children would initially say that both agents believe that rocks are inside the box, then, only by age 7, they would start to say that humans believe that crackers are inside the box, and God believe that rocks are inside. Conversely, in graph 2, a normal human being is used as the basis to understand God until quite late in development. Then, children start to learn that God possesses certain special characteristics that set God aside from common humans.

The weak stance postulates that children initially use humans as a basis to understand God's beliefs but start to differentiate them earlier in development than Piaget postulated—before reaching the age of 7. In other words, we are envisaging the possibility of Piaget being wrong simply in terms of the onset of the differentiation. In graph 3, an infallible human is used as a basis to understand God. In graph 4, a normal human is instead used as the basis. This explains why both the human and the God line stay flat for some time in the first instance, and climb initially in the second. Although these positions are not well established in the literature, they are possibilities that one should consider when dealing with cross-cultural data. For example, graph 4 can be seen as a plausible representation of people living in a society where the concept of God as omniscient is not very widespread.

Finally, moving on to the last graph in Fig. 1, a non-similarity perspective would predict that children being tested on the false-belief task would start differentiating between humans and God very early in development. This is the position that Justin Barrett and collaborators have been advocating (Barrett et al., 2001; Richert & Barrett, 2004; see also Atran, 2002). Their main idea is that young children do not need to conceptualize human agency first and then use it as a basis to understand supernatural agency; rather young children have already the potential to think independently about different types of agents and reason accordingly. In graph 5, the God line remains close to floor level, which signifies that children from an early age attribute mostly true beliefs to God, that is, that God knows that there are rocks in the box. The human line, on the other hand, starts at the same level as the God line but then by the age of 4 steeply climbs—children increasingly say that humans believe that the box contains crackers, as their capacity to attribute false beliefs improves.

Experimental data from the United States supports the prediction of this non-similarity position (Barrett et al., 2001). In Fig. 2, the results of a surprising contents experiment run with a sample of American children recruited from Reformed and Lutheran Protestant churches are presented. Children in the US sample can be seen to treat humans and God in the same way up to age 4. By age 5, they already sharply differentiate between the two agents. The divergence between God and the mother took place as children started to attribute false beliefs to the latter. A Wilcoxon Signed-Ranks Test for matched pairs comparing "crackers" responses between

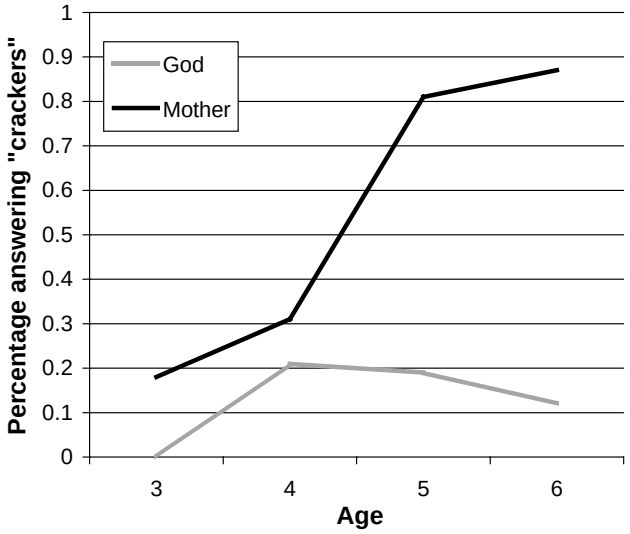

Fig. 2. False-belief task—US children.

mother and God at each specific age detected significant differences only for 5- and 6-year olds ($z = 2.37$, $p = .018$, $N = 17$ and $z = 2.93$, $p = .003$, $N = 9$, respectively).

However, there is no available cross-cultural evidence that addresses this question. In the next section, we present data on a similar false-belief task run with a sample of Yukatek Maya children, in order to provide a test of these theoretical predictions.

4. Methods

The Maya sample consisted of 48 children divided in four age groups: eleven 4-year olds (4.0–4.11), twelve 5-year olds (5.0–5.11), twelve 6-year olds (6.0–6.11), and thirteen 7-year olds (7.0–7.10). Twenty-six children were male and 22 were female. The experimenter piloted the protocol with some 3-year olds, but, since most of them seemed to have difficulty in concentrating long enough, they were dropped from the sample. The children resided in four small rural villages in the Quintana Roo state in the Yucatán peninsula (Southeastern Mexico). The overwhelming majority of people living in the rural interior of Quintana Roo are ethnic Maya.

The children generally began attending preschool when they were 4- or 5-years old, and started primary school when they turned six. Both the preschool and the primary school offer bilingual education, in Spanish and Yukatek Mayan. Although many individuals below the age of 50 are reasonably proficient in Spanish, the favored language in the domestic environment is Yukatek. For this reason, most of the children who enter preschool are virtually monolingual in this language. All children were interviewed in Yukatek by a native speaker, who has participated in several other studies in the region and is known to many of the participants' families.

The experiment consisted in a version of the "surprising contents" task. Participants were interviewed either in the hut of the experimenters or in their family's hut. The agents used were a doll named Soledad and the Catholic God (the Maya have adopted this religious entity into their pantheon several centuries ago). We decided not to use the mother as stimulus in Yucatán as it proved impossible to interview the children while their mother was away. In this situation, it would not have been feasible to control for the possibility of the child thinking the mother had a chance to see what was inside the container. The researchers used a container made out of a dried squash, known in Yukatek as *ho'ma*, which keeps maize tortillas warm after cooking them. The *ho'ma* has a small opening carved out on top, just large enough to put one's hand through. Every family visited by the experimenters owned at least one and usually several of these containers. Although they may be occasionally used to store other objects, there was high consensus among the participants that the normal, appropriate content was indeed tortillas, as measured by control questions asked at the beginning of the experiment ("what is this container called?"; "what would you usually find in it?").

The *ho'ma*'s opening was closed with a piece of cardboard, so that children could not tell what was inside. One of the experimenters opened the container to reveal a pair of shorts, a most unusual content. The container was closed again and the experimenters then asked the set of questions about the doll and God, in the following form: "What does X think is in the *ho'ma*?" In this experiment, children were not asked questions about other agents' behavior. However, Barrett et al. (2001) obtained very similar results when a sample of US children were asked a question about behavior—"Where would agent X look for object Y?" instead of "Where would agent X think the object is located?"

5. Results

Answers were coded as 1 when children said "tortillas" and 0 when they said "shorts." The percentage of children answering "tortillas" in each age group for the doll and God is shown in Fig. 3.

The answers for the doll showed a statistically significant positive correlation with age [$r(46) = .341$]. Therefore, as age increased, Maya children were more likely to attribute false beliefs to the doll. For example, 33% of the 4-year olds said that the doll would think tortillas were in the container compared to 77% of 7-year olds. In contrast, children treated God differently from the doll—as in the US, no significant correlation was detected between answers for God and age [$r(46) = .066$]. A Wilcoxon Signed-Ranks Test for matched pairs comparing "tortillas" responses found significant differences between God and the doll for 5-year olds ($z = -2.000$, $p = .046$, $N = 12$) and 7-year olds ($z = -2.449$, $p = .014$, $N = 13$), but not for 4- and 6-year olds.

When looking at the results, some patterns become apparent. The human line follows the same developmental course in both samples, but the Maya children seem to reliably pass the task about a year later than the American children. In the Maya sample, the difference between God and humans is not significant for 6-year olds, while it is both for 5- and 7-year olds. Furthermore, Maya children do not seem to reach the near-ceiling levels that are reported for many Euro-American samples of the same age on the 'doll' false-belief question: a *t*-test

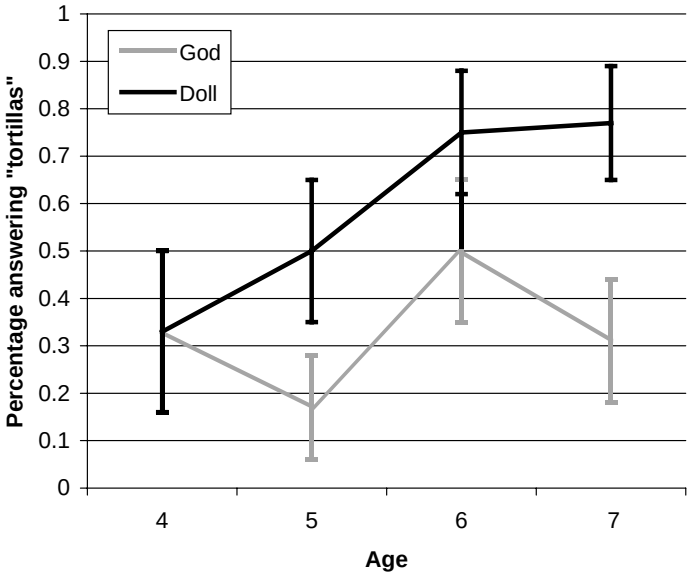

Fig. 3. False-belief task—Maya children. Error bars show ±1 standard error.

against chance for 6-year olds did not reach significance ($t(11) = 0.75$, $p = .082$); even 7-year olds, while significantly above chance ($t(12) = 0.77$, $p = .047$), are below the performance level of the American sample.

6. Discussion

The vast majority of developmental studies of false-belief understanding in reference to humans focus on samples of Euro-American and East Asian children, often from relatively high SES backgrounds (see Wellman et al., 2001). The cross-cultural evidence available from traditional societies so far is incomplete and inconclusive. At any rate, the two available studies of traditional populations (Avis & Harris, 1991; Vinden, 1996) and the present one seem to show that there is some uniformity in the way false-belief understanding develops, at least where human agency is concerned. However, even a brief inspection of the data presented above reveals that Yukatek children seem to be able to reliably pass a false-belief task only at age 7 (although their performance level is extremely close, though not significantly above chance, a year before); besides, they fail to reach near-ceiling levels at the same age as the children in the American sample. One possible explanation is that children in this community are less familiar than American children with the question/response format that characterizes this experimental task. This suggestion is corroborated by the fact that we were not able to successfully test an adequate number of 3-year olds due to their shyness, which does not usually pose problems to American experimenters. Another problem, now related to the God results, is the anomalous performance of 6-year old Maya children. This is less easily explained, but may be due to small sample size. To fully account for the general delay in performance in

relation to humans, and the 6-year olds' performance in relation to God, further studies are needed.

Now turning to the general discussion of the theoretical positions and their predictions, we can say that, while our results do not address the question of whether children consider the mother as a special kind of agent, they do add to the US findings in speaking against the idea that young children need to use humans as a basis to reason about God, which is the rationale behind all similarity positions. In this sense, the Maya results go in the direction of the non-similarity position, thus providing cross-cultural evidence for the perspective advanced by Barrett and collaborators.

It is important to emphasize that this implies simply that young children do not treat God and humans in the same way in terms of attribution of beliefs. That children truly understand God as a different sort of agent, and not just a human with a few strange properties (e.g., infallible beliefs, ability to make mountains, etc.) is difficult to disambiguate. Also, by no means do the data here support the claim that children's concepts of God are completely independent of their understanding of people in general and their parents in particular. For example, Christian theology teaches about a God who practiced self-anthropomorphization by becoming human in the form of Jesus of Nazareth.

The present results, however, clearly demonstrate that Yukatek young children, as well as American young children, do not treat God as *merely* human. For this reason, this work joins the growing literature that provides evidence against Piaget's notion that young children cannot treat other agents as importantly different from humans. For example, contrary to Piagetian artificialism (Piaget, 1969), Petrovich (1997) found that, although 4-year olds know that humans make machines and God does not, when asked to account for the origins of natural objects such as large rocks or mountains, they gave God the credit and not people. Similarly, several studies have uncovered evidence that 4-year old (and, in some cases, older) children believe magicians are a special type of agent able to perform actions that apparently violate natural causation (Chandler & Lalonde, 1994; Rosengren & Hickling, 1994). Further, recent research suggests that 4- and 5-year olds appreciate differences in perceptual abilities of different agents across sensory modalities (Richert & Barrett, 2004) and appreciate that God is more likely than humans to possess various forms of perceptual knowledge (Barrett et al., 2001).

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