God Can Hear But Does He Have Ears? Dissociations Between Psychological and Physiological Dimensions of Anthropomorphism

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Abstract

Anthropomorphism is a default strategy for making the unfamiliar familiar, but is it a uniform strategy? Do all dimensions of anthropomorphism "hang together"? We explored this question by involving adults ($n = 99$) in a speeded property-attribution task in which they decided, as quickly as possible, whether properties of two types—psychological and physiological—could be attributed to God. Participants not only attributed more psychological properties to God than physiological properties, but they were also faster, more consistent, and more confident in making those attributions. Participants showed the reverse pattern when denying properties to God. That is, they were slower, less consistent, and less confident in denying psychological properties to God than in denying physiological ones. These findings suggest that God is conceptualized, by default, as having a mind but not a body—a distinction that has important implications for the nature and origin of God concepts in particular and supernatural concepts in general.

Keywords: religious cognition, God concepts, folk theories

Introduction

The Greek philosopher Xenophanes of Colophon once noted, "If cattle or horses or lions had hands and could draw, and could sculpt like men, then the horses would draw their gods like horses, and cattle like cattle; and each they would shape bodies of gods in the likeness, each kind, of their own" (Lesher, 1992). This intuition—that God concepts are essentially a projection of human properties onto a nonhuman entity—has remained popular for centuries. Many scholars have appealed to anthropomorphism as a way of explaining religion in general (Guthrie, 1993; Hume, 1757; Tylor, 1871) or God concepts in particular (Boyer, 2001; Barrett & Keil, 1996; Kelemen, 2004). Guthrie (1993), for instance, has argued that belief in supernatural beings, like God, arises from an evolutionarily endowed propensity to interpret changes in the physical environment as products of intentional agency. Similarly, Boyer (2001) has argued that God concepts are highly memorable, and thus highly "contagious," because they are built from one of our most inferentially rich and early developing ontologies: the "PERSON" ontology.

This appeal to anthropomorphism, though initially a matter of speculation, has been validated by research demonstrating the ubiquity of anthropomorphic thought in everyday life. Psychological studies have shown that people regularly attribute human properties to nonhuman entities, including animated shapes (Heider & Simmel, 1944), computers (Nass & Moon, 2000), robots (Haslam, et al., 2008), pets (Epley, Waytz, & Cacioppo, 2007), nature (White, 1992), and groups of moving objects (Bloom & Veres, 1999). While there are a number of factors that influence the strength and consistency of such attributions—e.g., salience and accessability of intentional explanations, need to understand and predict the physical environment, degree of social connectedness (Epley et al., 2007)—the basic tendency to attribute human properties to nonhuman entities appears to be automatic, widespread, and early developing. Even infants appear to adopt an "intentional stance" in the presence of self-moving objects, expecting such objects to move in a goal-directed manner (Gergely, Nadasdy, Csibra, & Biro, 1995), exert stable preferences for some objects over others (Woodward, 1998), and interact contingently with other agents in the environment (Johnson, Slaughter, & Carey, 1998).

One important caveat when applying these findings to theories of religious cognition is that the kind of anthropomorphism readily displayed from infancy to adulthood is not the attribution of *all* human properties to nonhuman entities but the attribution of basic *psychological* properties—i.e., beliefs, desires, emotions, perceptions—to these entities. This distinction is important for two reasons. First, Boyer (2001) has explicitly argued that God concepts are really just "PERSON" concepts on to which God's extraordinary properties (e.g., omnipotence, omnipresence, immortality) have been grafted. This stipulation is vital to Boyer's larger claim that religious concepts derive their memorability from inconsistencies between the entailments of the concept's base ontology and the entailments of its unique, non-natural properties. In the case of God, inconsistencies between beliefs like (a) people die and (b) God does not die or (c) people are in one place at one time and (d) God is in all places at all times are what presumably makes God concepts highly memorable and thus highly transmittable. While it is possible that most people do, in fact, assign God the physiological attributes that would lead to such contradictions, this assumption does not automatically follow from the psychological literature on anthropomorphism, which documents a predisposition to treat nonhuman entities as *agents* but does not document a predisposition to treat those same entities as *people*.

Second, it is commonly assumed that people have two distinct God concepts, a concrete anthropomorphic concept, held implicitly, and an abstract theological concept, held explicitly. The two God concepts are thought to be inconsistent with one another and to be used in different contexts (Pyysiainen, 2004; Slone, 2004). These conclusions are based on a study by Barrett and Keil (1996), in which they assessed God concepts both directly, with specific questions about God's extraordinary properties, and indirectly, with a story processing task. The authors argued that if participants were asked directly what they believed about God, they would hesitate to articulate an anthropomorphic concept, for fear it might sound juvenile, but would not hesitate to articulate such a concept in a story recall task, where the object of investigation was presumably memory, not belief. The results showed that while participants explicitly endorsed abstract, theological statements like "God knows everything" and "God can do multiple mental activities simultaneously," they nevertheless imposed human limitations on God's mental activities when recalling stories about God. This inconsistency has been taken to indicate that abstract God concepts, of the form prescribed by theological doctrines, coexist with more concrete, anthropomorphic God concepts. Yet, without additional investigations of the kinds of human properties attributed to God and under what conditions, it remains unclear whether Barrett and Keil's (1996) findings are best interpreted as evidence of two globally distinct concepts or as evidence of a single concept plagued by local inconsistencies.

Given that many theoretical claims rests on the assumption that God is conceptualized as a *person* and not just an *agent*, we sought to extend the literature on God concepts by explicitly comparing property-attribution judgments for two types of properties: (1) psychological properties, like beliefs, desires, intentions, emotions, and perceptions, which are predicated on possessing a *mind*, and (2) physiological properties, like engaging in biological processes, possessing biological organs, and taking a physical form, which are predicated on possessing a *body*.

Our hypothesis was not only that participants would be more inclined to attribute psychological properties to God than physiological properties but also that the attribution of psychological properties would be *cognitively easier* than the attribution of physiological properties. We thus measured not just the frequency of psychological and physiological attributions but also (a) their speed, (b) their consistency across two sets of judgment, and (c) the confidence with which those judgments were made. Our prediction was that, if psychological properties are cognitively easier to attribute to God than are physiological properties, then participants should attribute them faster, more consistently, and more confidently. On the other hand, participants should exhibit the opposite pattern of results when *denying* properties to God. That is, participants should be faster, more consistent, and more confident when denying physiological properties to God than when denying psychological properties to God. It was also predicted that

participants would provide different types of justifications for their psychological and physiological judgments, given that the former may be based on earlier developing, and thus more automatic, modes of construal.

Method

Participants

Ninety-nine undergraduates at Occidental College were recruited from psychology courses and compensated with course credit. The majority (70%) were female, and 26% self-identified as Protestant, 15% as Catholic, 13% as Jewish, and 7% as something else (e.g., Buddhist, Quaker). The remaining 39% reported no current religious affiliation. While the proportion of participants without a religious affiliation was higher than desirable, participants' degree of religiosity did not interact with any of the findings noted below (see the "Correlations with Religiosity" section).

Procedure

Participants completed three tasks in a fixed order. The tasks were administered using MediaLab v2012 software. The first task was a speeded property-attribution task in which participants were shown one of 47 properties and asked to determine, as quickly as possible, whether that property was true of God. Participants registered their response by pressing 1 for "true" and 2 for "false," and their response times were recorded in milliseconds.

The properties were selected to cover a wide range of functions within each domain. The psychological properties were: knows things, knows what's what, is aware of things, can aim at something, can want, can strive for something, can desire something, can commit a planned action, can be goal oriented, can make plans, can be satisfied, can be happy, can be worried, can be sad, can hear, can see, can sense warmth, can smell, can sense coldness, can sense pain, and can taste. The physiological properties were: lives, can recover from an illness, can breathe, can eat food, can drink, can reproduce, can transmit a disease, can die, can grow old, can become ill, can become tired, has a heart, has a brain, has hands and feet, has eyes, has ears, has lungs, has bones, has a digestive system, has a vascular system, exerts force, has a stable existence, has an independent existence, can make an object move, has a measurable weight, has a measurable height. The ordering of the properties was randomized across participants.

Following each judgment, participants were asked to rate their confidence in that judgment on a scale from 1 to 5, with 1 labeled as "not confident" and 5 labeled as "100% confident." Participants were informed that, while their judgments were being timed, their confidence ratings were not, thus affording a brief respite between judgments.

The second task was similar to the first in that participants were shown the same 47 properties (in a randomized order) and asked to make property-attributions judgments once again. Doing so allowed us to assess the consistency of
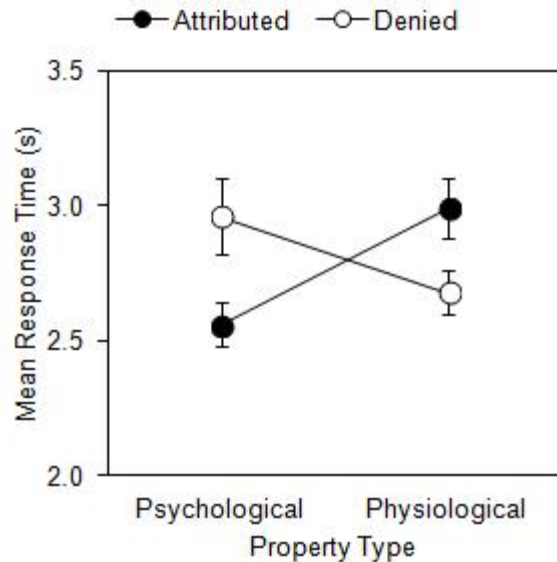
Figure 1: Response times (in seconds) by property type and judgment type.

Figure 2: Confidence ratings (out of 5) by property type and judgment type.

participants' judgments across two separate measurement periods. Participants were informed that their judgments in the second part of the survey were not being timed and were thus urged to take as much time as needed. Participants were also urged to provide a justification for each judgment. The coding of those justifications is described below.

The third task measured participants' religiosity using 16 items from the Fetzer Brief Multidimensional Measure of Religiousness/Spirituality (taken from Neff, 2006). The original scale includes 20 five-point items assessing daily spirituality, positive religious coping, private and public religiosity, and self-rated religiosity. Example items are "I believe in a God who watches over me" and "I find strength and comfort in religion." Four items were excluded because they were not specific to religious belief or belief in God (e.g., "I have forgiven those who hurt me"). Participants rated their endorsement of each item on a scale from 1 ("strongly disagree") to 5 ("strongly agree"). They also entered demographic information during this final part of the survey, namely, age, gender, and religious affiliation.

Results

Property Attributions

On average, participants were twice as likely to attribute a psychological property to God than to attribute a physiological property to God. The mean proportion of psychological properties attributed to God was 0.72 (SD = 0.27), whereas the mean proportion of physiological properties attributed to God was 0.35 (SD = 0.24). A paired-samples t test confirmed that this difference was highly significant ($t(98)$ = 17.24, p < .001). Thus, consistent with previous research (Shtulman, 2008, 2010), participants were more likely to attribute to God properties characteristic of
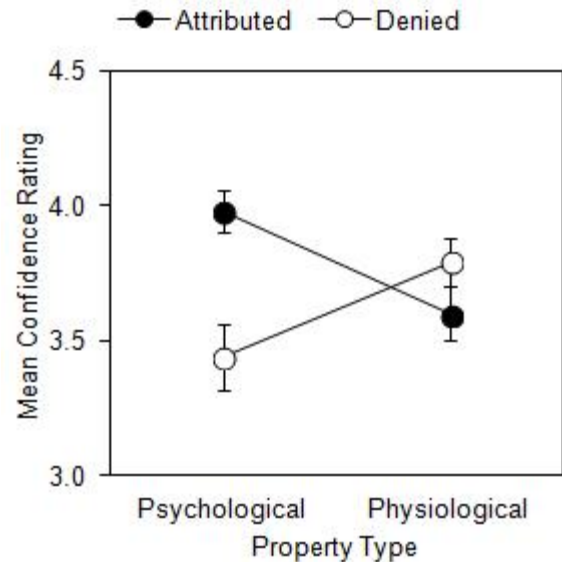
intentional agents than properties characteristic of living things or physical objects.

Response Times

Response times for the psychological properties (M = 2.59 seconds, SD = 0.78) were, on the whole, highly similar to those for the physiological properties (M = 2.65 seconds, SD = 0.73). Nevertheless, response times varied by judgment type across the two domains, as shown in Figure 1. When participants attributed a property to God, they were faster to do so for psychological properties than for physiological properties, yet when they denied a property to God, they were faster to do so for physiological properties than for psychological properties.

These effects were confirmed using a repeated-measures analysis of variance (ANOVA) in which property type was treated as a within-participants variable (psychological vs. physiological) and judgment type (attributed vs. denied) was treated as a between-participants variable. No main effects of property type ($F(1,98)$ = 1.24, ns) or judgment type ($F(1,98)$ < 1) were observed, but there was a significant interaction between them ($F(1,98)$ = 20.57, p < .001, partial eta^2 = .17). These results suggest that participants' default stance toward the psychological properties was to attribute those properties but their default stance toward the physiological properties was to deny those properties; making the opposite judgment thus required some additional degree of thought or effort.

Confidence Ratings

Participants' confidence ratings patterned similarly to their response times, as shown in Figure 2. A repeated-measures ANOVA of the same type used to analyze response times was used to analyze confidence ratings. This analysis
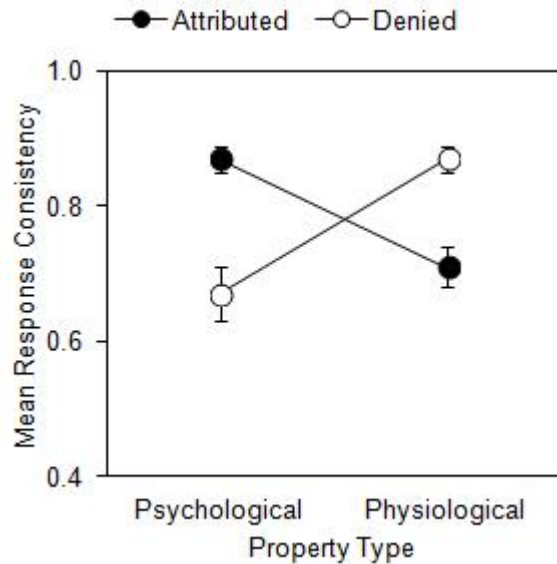
Figure 3: Proportion of consistent responses across trials by property type and judgment type.

Figure 4: Justification type (comparisons to humans vs. inferences from God's actions) by domain.

revealed no main effect of property type ($F(1,98) < 1$) but a significant main effect of judgment type ($F(1,98) = 3.99$, $p < .05$, partial eta^2 = .04), as participants were slightly more confident attributing properties to God ($M = 3.9$, $SD = 0.7$) than denying properties to God ($M = 3.8$, $SD = 0.8$). This analysis also revealed a significant interaction between property type and response type ($F(1,98) = 53.16$, $p < .001$, partial eta^2 = .35) such that confidence was highest for psychological properties when those properties were attributed to God but was highest for physiological properties when those properties were denied to God.

Response Consistency

Participants completed the property-attribution task twice, once under the prompt to respond as quickly as possible and once under the prompt to take as much time as needed. The proportion of properties for which participants provided the same judgment across trials is displayed in Figure 3 as a function of property type and judgment type. A repeated-measures ANOVA revealed similar findings to those revealed above: response consistency did not vary either by property type ($F(1,98) < 1$) or by judgment type ($F(1,98) < 1$) but did vary by the interaction between them ($F(1,98) = 53.46$, $p < .001$, partial eta^2 = .35). For psychological properties, participants were more likely to change their minds about denying those properties to God than about attributing them to God; for physiological properties, however, the reverse was true. We should note that the overall proportion of properties attributed to God in the second block of judgments was similar to that in the first block. Under speeded conditions, participants attributed, on average, 72% of the psychological properties and 35% of the physiological properties. Under non-speeded conditions, those percentages were 71% and 32%, respectively.
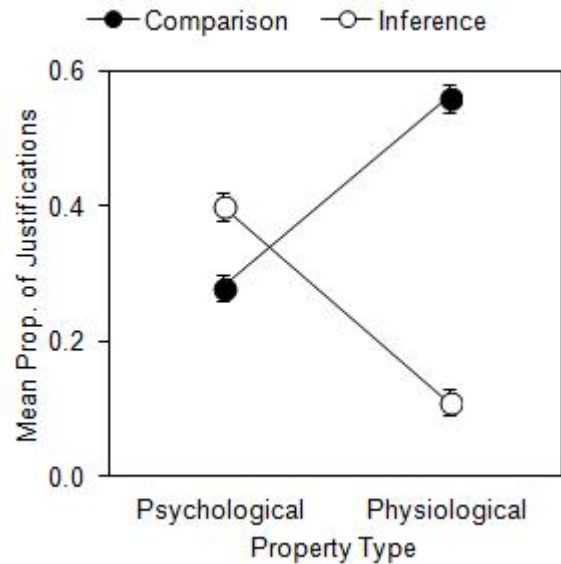
Justifications

In the second (unspeeded) block of property-attribution judgments, participants provided justifications for those judgments. Justifications were sorted into one of three categories: comparisons to humans, appeals to God's properties, or inferences from God's actions. Comparisons to humans emphasized similarities between God and humans in the case of properties attributed to God (e.g., "God has human senses") or differences between God and humans in the case of properties denied to God (e.g., "God doesn't experience the world like humans do"). Appeals to God's properties highlighted some aspect of God's unique, theologically specified ontology that was either consistent with the property at hand (e.g., "God can influence the world by any means") or inconsistent with that property (e.g., "God doesn't live because God doesn't die; God simply exists"). Inferences from God's actions specified how the property at hand was either presupposed by something God is purported to do (e.g., "If God can listen to our prayers then I would assume that he can hear them") or precluded by something God is purported to do (e.g., "God cannot transmit a disease because he never harms others"). The reliability of this coding scheme was assessed by comparing the codes of two independent coders for a quarter of the 4653 justifications provided. Agreement was high (86%, Cohen's kappa = .79).

Overall, 44% of justifications were coded as comparisons to humans, 27% as appeals to God's properties, and 24% as inferences from God's actions. The remaining 5% did not contain any codable information. Domain differences were observed for two of the three types of justifications: comparisons to humans and inferences from God's actions. These differences are displayed in Figure 4. When justifying judgments for psychological properties, participants tended

to cite inferences from God's actions, but when justifying judgments for physiological properties, participants tended to cite comparisons to humans. Participants were equally likely to appeal to God's unique properties when justifying psychological judgments ($M = 0.26$, $SD = 0.17$) and physiological ones ($M = 0.28$, $SD = 0.16$; $t(98) = 1.35$, ns).

The justification data were analyzed using a repeated-measures ANOVA in which property type (psychological vs. physiological) was treated as a within-participants variable and justification type (comparison vs. inference) was treated as a between-participants variable. No main effect of property type was observed ($F(1,98) < 1$) but a significant main effect justification type was ($F(1,98) = 23.80$, $p < .001$, partial eta^2 = .20), consistent with the overall distribution of justification noted above. More importantly, the interaction between property type and justification type was also significant ($F(1,98) = 139.72$, $p < .001$, partial eta^2 = .59), indicating that participants found different kinds of considerations salient when reflecting on different kinds of properties. God's similarity to humans was most salient when reflecting on God's physiological properties, but God's role in worldly affairs was most salient when reflecting on God's psychological properties.

Correlations with Religiosity

Correlations between participants' scores on the Fetzer Brief Multidimensional Measure of Religiousness/Spirituality (Neff, 2006) and their property attributions, response times, confidence ratings, response consistency, and justification patterns are displayed in Table 1. The higher participants' scores, the more properties they attributed to God—both psychological and physiological—and the more confident they were in their judgments. Higher scores were also associated with different justification patterns, namely, more inferences from God's actions and fewer comparisons to humans. In short, the more religious participants were, the more they treated God like a human in their property attributions but the less they explicitly compared God to a human in their justifications. Importantly, these effects did not differ by domain, which indicates that religiosity may influence overall levels of anthropomorphism but not the dissociation between psychological and physiological dimensions of anthropomorphism documented above.

Table 1: Correlations between Fetzer religiosity scores and responses to the psychological (psych) and physiological (phys) items. *$p < .05$, **$p < .01$

Measure	Psych	Phys
Property attributions	.38**	.29**
Response times	.02	.03
Confidence ratings	.24*	.20*
Response consistency	.05	.03
Justifications:		
(a) Comparisons to humans	-.27**	-.27**
(b) Inferences from God's actions	.25*	.38**
(c) Appeals to God's properties	.18	.14

Discussion

Belief in God is central to the lives of many Western adults, but much remains unknown about the conceptual foundations of this foundational belief. Previous research on the nature of God concepts has assumed that such concepts are rooted in a widespread and early developing tendency to anthropomorphize the natural world (e.g., Guthrie, 1993), and the present study investigated this assumption by clarifying (a) the dimensions along which God is, and is not, typically anthropomorphized and (b) the speed, consistency, and confidence with which those dimensions are deployed. It was found that participants not only attributed more psychological properties to God than physiological properties, but they were also faster, more consistent, and more confident in making those attributions. Moreover, participants showed the reverse pattern when *denying* properties to God, being slower, less consistent, and less confident when denying psychological properties to God than when denying physiological properties to God.

These findings complement Bering's (2002) finding that adults make a clear distinction between psychological properties (e.g., thinking, feeling) and biological properties (e.g., eating, drinking) when reasoning about the continuity of life after death, with most attributing psychological properties to the dead but few attributing biological or even psychobiological properties (e.g., hunger, thirst). These findings also complement Astuti and Harris's (2008) finding that, in cultures where it is commonly believe that the dead continue to exist as ancestral spirits, most people believe that psychological properties survive the transition from person to spirit but biological properties do not.

On the other hand, these findings are not particularly consistent with Boyer's (2001) claim that God, among other supernatural beings, is conceptualized as a *person* with counterintuitive properties. Rather, most adults appear to conceptualize God in a more limited manner—i.e., as an *agent*, in possession of mind-dependent properties like seeing, knowing, and feeling, but not body-dependent properties like eating, breathing, and growing. These findings are also inconsistent with Barrett and Keil's (1996) claim that we hold two distinct God concepts: an implicit anthropomorphic concept and an explicit theological concept. Putting individuals under time pressure is a well-established method for eliciting implicit concepts (Goldberg & Thompson-Schill, 2009; Shtulman & Valcarcel, 2012), yet, in the present study, attributions of human properties to God did not differ between speeded and unspeeded conditions. Moreover, those attributions should have decreased with religiosity if religious individuals are more familiar with, and more accepting of, theological concepts than are non-religious individuals. But, in actuality, the opposite was found: participants' attributions *increased* with religiosity, both in the psychological domain and in the physiological domain.

In sum, the findings of the present study suggest that anthropomorphism (gr. *anthropo* = human) may not be the best way to characterize people's God concepts. Instead,

these concepts may be better characterized as *agentive* or even *animistic* (lat. *anima* = soul, spirit, breath). Analyzed in this way, participants' attribution patterns appear to be symptomatic of what Lindeman and Aarnio (2007) have termed "core knowledge confusions," or instances in which the properties of one foundational domain are applied (inappropriately) to the entities within another. Examples include misapplying psychological properties to non-psychological entities (e.g., attributing memory to furniture), misapplying biological properties to non-biological entities (e.g., attributing healing powers to water), and misapplying physical properties to non-physical entities (e.g., attributing contact causality to thought).

Lindeman and colleagues have found that susceptibility to core knowledge confusions is correlated with multiple dimensions of paranormal belief (Lindeman & Aarnio, 2007) and with interpreting random events as having a purpose (Svedholm, Lindeman, & Lipsanen, 2010). The present work extends this analysis into the domain of religious belief, as participants' God concepts could easily be characterized as core knowledge confusions between physical, biological, and psychological phenomena—i.e., as the misapplication of a handful of biological properties, like "can live," and a handful of physical properties, like "has an independent existence," to the human mind. Whether or not this analysis is correct, we maintain that God concepts are best studied within a broader developmental perspective and that future research should focus not just on the concept-ualization of God's extraordinary properties but also on the conceptualization of God's "ordinary" properties, like seeing, hearing, wanting, and knowing. It is these properties, after all, that has inspired anthropomorphic explanations of religion from Xenophanes' time to the present.

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