

Anthropomorphism in God concepts: The role of narrative

Peter Westh, Department of Cross Cultural and Regional Studies, University of Copenhagen

pwesth@hum.ku.dk

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There is an emerging consensus among current cognitive theories of religion that the detection and representation of intentional agents and their actions are fundamental to religion. By no means a monolithic theory, this is an argument with several separate lines of reasoning, and several different kinds of empirical evidence to support it.

This essay focuses specifically on the notion that people tend to spontaneously make inferences about gods¹ based on intuitive, ontological assumptions, and on one of the main pieces of evidence that is cited to support it: the narrative comprehension experiments conducted by psychologists Justin L. Barrett and Frank C. Keil (Barrett and Keil 1996; Barrett 1998).²

Religion as anthropomorphism

That anthropomorphism is indeed a universal trait of religions the world over has been acknowledged by generations of scholars of religion, but it was the anthropologist Stewart Guthrie who first made this fact the backbone of a cognitive theory of religion (Guthrie 1980; 1993; 1996).

On Guthrie's view, religion quite simply *is* anthropomorphism (Guthrie 1993: 178) and the result of an evolved "perceptual strategy" (ibid. 1993: 41). Just as frogs are prone to see moving dots on a screen as flies, and sea urchins will avoid any dark shadow as if it were an enemy fish, humans too tend to interpret their environment with the "models generated by their most pressing interests" (Guthrie 1996: 418; 2002: 54). And what matters most to

¹ In this essay, I use the term "god" as shorthand for culturally postulated superhuman beings generally.

² Thanks are due to Thomas Hoffmann, Gabriel Levy, Andreas Liebroth, Anders Lisdorf and Milena Nielsen for their stimulating comments on earlier versions of this essay.

humans (and mattered most to humans during the Pleistocene) is other humans. So even if the perceptual strategy of anthropomorphism generates massive over-detection, it has had adaptive value nevertheless, as the price of false positives is much lower than the price of missing important cues. Perfect paranoia is perfect awareness.

Guthrie's theory posits a strong continuity between *anthropomorphism*, the attribution of human features to nonhuman things, and *animism*, the attribution of life to nonliving things. Their evolutionary rationale is the same: Mistaking a boulder for a bear is relatively inconsequential; mistaking a bear for a boulder is fatal. As the above examples show, animism is widespread even among nonvertebrates, and so the cognitive mechanisms underlying religion have an extremely deep evolutionary history (Guthrie 2002)

The range of phenomena covered by Guthrie's notion of anthropomorphism is exceedingly broad: from seeing faces in the clouds (Guthrie 1993) and human shapes in Rorschach ink blots (Guthrie 1980:188); through cartoons about talking animals; mistaking mail boxes for people (ibid. 1980:189) and kicking at door edges when we walk into them (Guthrie 1993:47); talking about tables having legs and genes being selfish (Guthrie 2002: 59); and seeing natural disasters as divine punishment, messages in the flight of birds (Guthrie 1980:189) and intelligent design in nature (Guthrie 1993:186). One might reasonably doubt that the same cognitive processes could lie behind all of these – and indeed, that the same evolutionary explanation is valid for all of them (Barrett 1998:609).

However, Guthrie does not seem to claim the existence of one, unifying cognitive process underlying all instances of anthropomorphism. Rather, he draws on a broad array of sources, from Piaget through Gestalt psychology to Prototype theory and Conceptual Metaphor theory, to make the general point that "models", "schemata" and "metaphor" play a fundamental role in human perception (Guthrie 1993: 43-47, 101). Guthrie recognizes that while some of these schemata have a long evolutionary history and are arguably innate (i.e. animism), others are culturally acquired. In crucial contrast to the other theorists discussed below however, he does not see this difference as very significant: The same strategic bias in favour of the models with the highest complexity and relevance is at work at both levels (Ibid. 1993: 45; Guthrie 1980:189).

Anthropomorphism in modular perspective

The psychologist Justin Barrett and the anthropologist Pascal Boyer have both criticized and reformulated aspects of Guthrie's theory. Unlike Guthrie, who makes no real attempt at formulating a coherent psychological theory³, they are both committed to some version of the strong modularity theory of the human mind. This has profound implications for how they develop Guthrie's notion of anthropomorphism.

In a modular perspective, Guthrie's "perceptual and cognitive strategy" is comprised of at least two, distinct, cognitive mechanisms. First, underlying the general bias toward animism and anthropomorphism is a bias toward attributing and inferring *agency* – in Barrett's terms, the human mind is endowed with a Hyperactive Agency Detection Device (HADD). Second, the fact that people tend to attribute human characteristics to gods is then explained with reference to "a more general intuition-generator that operates on all intentional agents" (Barrett 1998:617). That is, once the presence of an intentional agent is established by the HADD, various domain-specific inference systems proceed to produce intuitive expectations regarding it.

The Hyperactive Agency Detection Device

That *agency* is a fundamental building block of religious representations the world over was first suggested by Lawson and McCauley (1990), though at that point without recourse to specific psychological mechanisms. This is directly addressed by Boyer and Barrett, and the mechanism of agency detection that they suggest is supported by a large body of experimental evidence (Scholl and Tremoulet 2000). As interesting and controversial as this evidence and its interpretation is, it has little direct bearing on the line of argument pursued here. Two points are, however, worthy of mention.

First, it should be noted that Boyer's and Barrett's theory is in fact distinctly at odds with Guthrie's. Consider Boyer's criticism: (Boyer 2001:163-164)

³ Guthrie does explicitly denounce modularity theory (Guthrie 2002:54)

The anthropomorphic tendency described by Guthrie is certainly there. However, before we understand how it contributes to people's notions of supernatural agents, we must make this psychological description a bit more specific. [...] Note that gods and spirits are not represented as having *human* features in general, but as having *minds*, which is much more specific [...] indeed, anthropologists know that the *only* feature of humans that is *always* projected onto supernatural beings is the mind.[...] What happens in religion is not so much that people see 'faces in the clouds' (in the way described by Guthrie) as 'traces in the grass'. That is, people do not so much visualise what supernatural agents must be like, as detect traces of their presence.

As described above, a large part of the evidence adduced by Guthrie concerns exactly the kind of projection of human features that Boyer here dismisses as peripheral to religion. There is no convincing argument that, for example, seeing faces in the clouds or human shapes in Rorschach inkblots somehow involves the attribution of agency or mind. Therefore, it would seem that Boyer and Guthrie are in fact talking about different things. The agency detection of Boyer and Barrett is a very specific psychological mechanism. By contrast, the anthropomorphism of Guthrie is an umbrella term that certainly covers the psychological mechanism of agency detection, but only as one among many other phenomena. This is a problem, in so far as Guthrie is often cited as offering massive, anthropological evidence for the existence of HADD (Slone 2004:57-58; Bulbulia 2004:658).

Where does this leave the HADD thesis? There is little doubt that the perceptual mechanism of *agency detection* as such exists; the experimental evidence does suggest that both infants and adults need only very minimal cues of a specific kind to attribute agency (Scholl and Tremoulet 2000; Barrett 2004:44 n.3). However, the claim that this mechanism is generally and inherently *hyperactive* – that is, prone to firing simply in the face of ambiguity or even given no cues at all – remains to be demonstrated in a controlled setting, even if the evolutionary narrative thought to account for it seems entirely commonsensical.

This leads to the second point. As Boyer has noted, a HADD would only have been adaptive if false positives were quickly abandoned. (Boyer 2001:167-168). Being on the alert certainly increases chances of survival; being constantly recoiled in fear surely does not. The adaptive response to the detection of agency would be to search for further clues, and when these prove

to be absent quickly abandoning the idea. This in fact seems to be what people do, at least judging from the anecdotal evidence familiar to all of us: Mistaking boulders for bears, hearing voices in the wind etc. In this sense, it might be more appropriate to talk about hyperactive agency *suspicion* rather than agency *detection*. Even if HADD does exist, the question remains just how and why these agent concepts are stabilized and elaborated on, rather than simply dismissed for lack of evidence.

Domain-specific inference systems and intuitive ontology

The more general implication of the modular perspective is of course that the human mind contains an array of different inference systems delimiting, and dedicated to processing information from specific domains of experience. The number and specific functions of these systems is by no means fixed, as it is to some extent relative to the particular research interests of various scholars, and to the level of granularity of any particular enquiry. The cognitive science of religion, however, usually invokes only three broadly characterized systems dealing with intuitive physics, intuitive biology and intuitive psychology (Boyer 2002). Intuitive physics generates expectations about the behaviour of solid objects in space (an object has only one location in space; if not supported an object will fall to the ground; if pushed by an external force it will move along an inertial path etc.); intuitive biology expectations about living beings (a living being eats, sleeps, and eventually dies; if it has offspring, they will be of the same natural kind etc), while intuitive psychology underlies the whole gamut of belief-desire psychology attributable to intentional agents, often subsumed under the umbrella term Theory of Mind (an agent has intentional states; it has a focus of attention; it acts in pursuit of goals etc). Once the mind has assigned a phenomenon to one of these ontological categories, it will automatically and unconsciously deliver up a host of tacit assumptions or "non-reflective beliefs" about it. The categories are hierarchically nested, so that intentional agents are usually understood to be living beings, and living beings to be physical objects.

All of this (though perhaps not its modular architecture) is again quite well documented (Boyer 2002; Boyer and Barrett 2005). One body of evidence of particular relevance here is the phenomenon of "predicate-spanning" (Boyer 2002; Keil 1983). Even preschoolers are able to make elaborate assumptions about an unknown object, based on what predicates are attached to it. Given the sentence "The Wug is asleep", a child will immediately infer a great

deal about Wugs, for instance that Wugs may also be "awake", "hungry", "large" or "stupid", but that it would not make sense to say that a Wug "lasts two minutes" or that it was "written by Daniel Dennett" (Keil 1983: 108). These types of spontaneous inferences provide evidence of the way intuitive, ontological distinctions develop.

While some perceptual sorting of phenomena into ontological categories appears surprisingly early in development and could arguably be innate ("agency detection" being a case in point), more complex ontological distinctions obviously rely on accumulated experience to develop. Nevertheless they seem to display limited cultural variation, at least at the more basic levels.

Now, the point of all of this is that religious concepts in general and god concepts in particular rely heavily on intuitive background assumptions. [A few sentences deleted here] Even when deities are professedly believed to possess unique, out-of-the-ordinary and counterintuitive properties such as being invisible, all-knowing and immortal or beyond space and time, they nevertheless behave largely in accordance with intuitive expectations. Recapitulating Guthrie, religion *is* anthropomorphism.⁴

But how, more specifically, do these tacit, ontological assumptions enter into the formation and processing of god concepts? This is one of the questions that Barrett and Keil investigate in their story comprehension experiments, and their answer has proven extremely influential in the cognitive science of religion.

The story comprehension experiments

The experiments conducted by Barrett and Keil are variations on the classic story comprehension paradigm of Bransford and McCarrell (1974). Essentially, you let test subjects

⁴ There is an ongoing discussion whether the term anthropomorphism is in fact an adequate description of this. The cognitive systems responsible for these intuitions are not, the argument goes, dedicated to the representation of humans exclusively, but rather to "intentional agents" in a more generic sense (Barrett 1998: 617; Barrett et al. 2004). Hence, gods are not really modelled on humans. This is a complex discussion involving both questions regarding the innateness of the cognitive structures involved; their proper evolutionary domain; epistemology and perhaps even metaphysics. I will not enter into it here.

Another point of disagreement that is not directly relevant here, but which should be noted, is the question whether anthropomorphism is so widespread because it is *intuitive* or for the opposite reason: because it is (minimally) *counterintuitive*. Guthrie and Barrett quite clearly claim the former, while (Boyer 1996) argues for the latter explanation.

read or hear a narrative that, although short, is too long to be remembered verbatim. After a while, you let them retell the story. By studying how the recalled versions differ from the original narrative, you get indirect evidence of how test subjects comprehended the narrative and stored it in memory.

Generally, these kinds of tests show that comprehension and recall is very far from being a simple and passive process of storage and retrieval. Rather, test subjects are required to make a significant "cognitive contribution" in order to make sense of texts. In the words of Bransford and McCarrell "comprehension results only when the comprehender has sufficient alinguistic information to use the cues specified in linguistic input to create some semantic content that allows him to understand" (Bransford and McCarrell 1974:204f). This "alinguistic information" can be drawn from contextual cues, prior knowledge or tacit assumptions. For instance, giving the narrative a title which indicates what it is about can massively improve recall, but only if test subjects are provided with it *before* reading or hearing the narrative (Ibid. 206). In the terminology used by Barrett and Keil, the story title makes certain schemata more "salient" in the comprehension process (Barrett and Keil 1996:228).

The cultural background of test subjects too has been shown to have a profound effect on story comprehension and recall so that, for instance, people will distort and elaborate on a story about a wedding in an alien culture according to their own cultural knowledge about weddings (Steffensen et al. 1979).

The Barrett and Keil experiment used eight narratives of about 100 words each, in which "God" acted as a protagonist, for example by responding to prayers from people in need, or having attitudinal states regarding various objects and events in the world. The stories were recorded on cassette, and played back for the test subjects. The stories were deliberately formulated so that they did not impose a specific conception of God on test subjects, thus requiring them to make their own "cognitive contribution". In this way, Barrett and Keil "hoped to tap into the god concepts that subjects use in their daily lives to make judgements in real time" (Barrett and Keil 1996:223).

After having heard each story, test subjects answered a series of six to nine yes/no questions about the content of the stories. Two thirds of these were "Base Items", regarding the concrete events in the story (i.e. "the boy was swimming alone"), while one third regarded how God

was conceptualized. These "God Items" were intended to probe for various aspects of anthropomorphism not explicitly present in the texts, particularly: (ibid. 226)

- a. moving
- b. being in a particular place
- c. requiring sensory input to gather information
- d. performing only one task at a time
- e. having a single focus of attention
- f. having sensory limitations
- g. being unable to process competing sensory stimuli distinctly

As an aside here, it is noteworthy that only about half of these properties - c), e), f) and g) – apply specifically to the ontological category of "intentional agents". The rest – a), b) and d) - apply equally well to physical objects and living beings. On the other hand, several properties of God in the stories that must be considered as belonging to the domain of intuitive psychology are *not* included in the list, i.e. "listening", "answering", "enjoying", "watching" etc. (ibid. 239). Thus, just as in the case of Guthrie, the concept of anthropomorphism investigated by Barrett and Keil does not turn pivotally on Theory of Mind, as is sometimes claimed (Boyer 1998: 881).

Besides the story comprehension task, test subjects completed a questionnaire about their own view of God (assuming he existed – many but not all test subjects were believers of various denominations). The questions aimed to probe subjects' conception of God along the same dimensions as the recall items (i.e. whether God is all-knowing, can do several things at once, is spatio-temporal and so on) (Barrett and Keil 1996:225).

The result of this first experiment (Study 1A) and of the later follow-up experiment with Hindi subjects carried out by Barrett (Barrett 1998), were rather clear: Recall precision for God Items relative to Base Item performance was only 45.1%⁵. Put the other way round, in

⁵ Recall precision for Base Items was 86.2%, while recall precision for God Items was 38.8%. The accuracy of God items relative to Base item accuracy is calculated simply by dividing God Item accuracy with Base Item accuracy, on the assumption that the Base Item accuracy is the highest accuracy that can be expected. See (Barrett and Keil 1996: 230, note 4)

54.9% of all instances test subjects used an anthropomorphic God concept to process the stories. This is in striking contrast to the questionnaire results, which showed almost 100% agreement that God is non-anthropomorphic, at least as defined by Barrett.

In other words, test subjects clearly did not bring their professed God concept to the task of comprehending and remembering the stories. Instead, their cognitive contribution was in many cases a God concept seemingly far more mundane and commonsensical; that is, more in accord with intuitive, ontological assumptions.

Barrett and Keil did several additional experiments, and they discuss various possible interpretations of their results. Before looking more closely at this, however, it will be useful to consider how the Barrett and Keil experiments have been received within the cognitive science of religion.

"Cognitive pressure "

In his 1999 article on "Theological Correctness", Barrett uses the story comprehension experiments as the basis for a broader theory of religious cognition. He writes (Barrett 1999:338).

In both natural and religious thinking, people have multiple levels of representation or conceptualization that may be contradictory. These concepts range from fairly simple or concrete to very complex and abstract. Selection of the concept to be used in any given context is largely dependent on the cognitive processing demands of the task. In tasks in which there is a great demand to draw quick and precise inferences, a basic concept, comprised largely of intuitive knowledge is used. In tasks in which there is less demand, as when one is slowly and carefully reflecting on one's knowledge, more complicated, intuition-violating theoretical concepts may be drawn upon.

People, the argument goes, have limited cognitive processing capacity, and sophisticated, counterintuitive concepts are cognitively laborious. So when put under strain, people default to the most primitive, cost-effective concepts at their disposal. The implication is of course that in this respect, the story comprehension task resembles real life problem solving, and thus

the experiment offers evidence of the cognitive mechanisms responsible for the universality of anthropomorphism in religions the world over.

This idea of "cognitive of pressure" has been widely accepted within the cognitive science of religion as an empirically established fact, as the following quotations from some of the most prominent scholars within the field – not denying some important differences of nuance – show. Emphasis is added.⁶

Robert N. McCauley (2000:78):

In an intriguing set of experiments, Justin Barrett and Frank Keil have shown that subjects reliably treat deities anthropomorphically in their *on-line cognitive processing*, regardless of their nonanthropomorphic, "theologically correct" pronouncements about God during more reflective moments [...] These findings indicate that a good deal of people's knowledge about how the gods operate does not turn on any specifically cultural content or, at least, not on any uniquely religious knowledge.

Pascal Boyer (2001:103)

The recall test produces what could be called a certain '*cognitive pressure*' which *diverts their attention* from the desire to express 'correct' beliefs... When the task allows for conscious monitoring, we get the theological version; when the task *requires fast access*, we get the anthropomorphic version.

Ilkka Pyysiäinen (2004:156)

It has, for example, been shown in empirical experiments that in *fast on-line reasoning* people rely on a rather unorthodox concept of God, although they explicitly say they are committed to the orthodox concept. Their intuitions thus differ from their explicit beliefs, and it is the intuitions that largely drive behavior. People have unorthodox beliefs because it is often quite impossible to draw any relevant inferences from such abstract beliefs as for instance "God as the Ground of

⁶ See also (Lawson 2001:160) and (Slone 2004:66)

Being." People *slip back* into intuitive religion, which is both *easier to handle* and more relevant from the everyday point of view.

Harvey Whitehouse (2004:189)

Barrett has assembled a compelling body of evidence that Christians, for instance, whether experts or novices in their particular tradition, readily *slip* into more intuitive ways of conceptualizing God, *if the cognitive system is under pressure*. In particular, they will abandon their TC concepts of omnipresence and adopt a more humanlike notion of God, whenever the cognitive resources available for the task of reasoning about God's behaviour *have been sufficiently restricted*.

Leaving aside the impression that Barrett's idea has been interpreted in rather more Freudian terms than originally intended (as evidenced by such elaborations as *desire* and *slipping*), the questions that will concern us here are more fundamental: What is cognitive pressure? And why would the story comprehension task make a greater "demand to draw quick and precise inferences" than the questionnaire? The answers to these two questions are, I submit, far from clear.

It is true that in Study 1, the story comprehension task was performed under some time pressure, while the test subjects were allowed to fill out the questionnaires at their leisure (Barrett and Keil 1996:225-227). In studies 2 and 3, however, and in the later follow up study by Barrett, test subjects were allowed to complete the story comprehension task at their own pace, even with the printed stories in front of them. (Barrett and Keil 1996: 235, 238; Barrett 1998:614) This did not alter their performance significantly. (Barrett and Keil 1996: 235-236, 238-240; Barrett 1998:615; and see discussion of Study 2 below). Hence, there is no reason to think that the anthropomorphic bias in the story comprehension task was caused by a pressure to perform "*fast* on-line reasoning" or by limited memory capacity. If indeed there was a "cognitive pressure", it must have been due to the *complexity* of the task rather than a demand for simple and fast heuristics.

In other words, processing stories must somehow be intrinsically more difficult than introspective reflection on ones beliefs about God. But is that a plausible claim? On the face of it, it would seem that it was the other way round. Narrative is a universal feature of human culture; four year olds can tell and retell stories, and do so routinely and spontaneously;

processing stories does not depend on intensive schooling or socialization, beyond that involved in language acquisition. By contrast, talk about abstract concepts decoupled from any concrete setting is rare, late to develop and clearly dependent on the acquisition of complex cultural codes. This is a crude argument, but it is sufficient to cast doubt on "cognitive pressure" as an adequate explanation of the results of the story comprehension task.

The role of narrative

If cognitive pressure cannot explain the anthropomorphism evident in the story comprehension task, what can? Could it be that the anthropomorphic bias is not contributed by the test subjects at all, but rather is prompted by the task itself?

As noted above, some of the language used in the stories to describe God is certainly anthropomorphic, even though it does not fall under the working definition of anthropomorphism employed in the experiment. "Enjoying", "watching", "listening", "being pleased" etc. are all intentional states, and thus imply that God is an intentional agent. Perhaps cues such as these prompt test subjects to anthropomorphize God? Is this not exactly what would be expected, given what we know about "predicate spanning"? If the sentence "the Wug is asleep" can prompt preschoolers to make ontological assumptions regarding what a Wug is, one might suspect that the sentence "God enjoyed the smell" could prompt similar intuitions (Barrett and Keil 1996: 239).

Barrett and Kiel counter this argument in several ways. In study 1C, test subjects completed the questionnaire immediately prior to doing the story comprehension task, in an attempt to make their professed, non-anthropomorphic God concepts more "salient". This increased recall accuracy for God Items relative to Base Item performance from 45.1% to 54.9%⁷. This result, Barrett and Keil argue, rules out the explanation that "the tendency to anthropomorphize is a product of the task and the agent's ontological category membership and independent of actual concepts of God" since, if that was the case, "no manipulation of God concepts before entering the task should have an effect on the results." (ibid. 232).

This argument is logical enough, but it does not really counter the suggestion that anthropomorphization is prompted by certain features of the story itself; it counters a straw

⁷ Recall precision for God items was 47.3%, while recall for Base Items was the same as in study 1A.

man. The "strong" thesis that the process of story comprehension is *completely divorced* from whatever concepts test subjects bring to the task is entirely implausible. However, a weaker version of the argument – namely that certain features of the story *create a strong anthropomorphic bias* – might still hold. In fact, it would explain why recall accuracy was still so poor in spite of the salience manipulation.

Very similar results were obtained in study 1B, in which "God" in the stories was replaced by a fictitious, future super-computer named Unicomp. Before the task, Unicomp was explicitly described to test subjects as being physically everywhere at once, able to read minds and detect all events by non-sensory means, able to perform multiple tasks simultaneously etc. – that is, as not possessing the anthropomorphic properties a) - g) listed above. Test subjects completed a short questionnaire about Unicomp, and then proceeded to complete the story comprehension task (ibid. 227)

The conditions of this study were thus very similar to those of study 1C, and so were the results: Recall accuracy for Unicomp Items relative to Base Item performance was 60.2%⁸. This is only insignificantly higher than in the salience condition of study 1C. Barrett and Keil argue at length that the mechanisms underlying the results of these two studies are in fact very different (ibid. 231-233, 241), but given the similarities in both test conditions and results, the conclusion that the same mechanisms are at play in both studies immediately suggests itself.

Only one test condition was able to reduce anthropomorphism even further. Study 2 was, as already mentioned, conducted with no time pressure, and subjects were allowed access to both the written stories and any additional material while completing the task. This was done to rule out the possibility that the anthropomorphism in study 1 was caused by memory distortion. The experiment was conducted under five different conditions, each aiming to manipulate the level of anthropomorphism in different ways. The five conditions and their results, given as Recall Item accuracy relative to Base Item accuracy, were as follows (ibid. 235-236):

1. A "Superman condition" in which God in the stories was replaced by Superman:
46.1%

⁸ 81.5% accuracy on Base Items and 49.1% accuracy on "Unicomp Items". (Barrett and Keil 1996:230-231)

2. A "nonhuman God condition" in which, prior to the task, subjects were explicitly instructed to think of God as "radically different from a human": 55.9%
3. A "God condition", which was essentially a replication of study 1, apart from the fact that subjects had access to the written stories while completing the task: 62.2%
4. A "Super-agent condition" where God was replaced in the stories by three "beings from another dimension of existence" named Mog, Beebo and Swek. The descriptions presented to test subjects of these beings were in all relevant respects similar to the description of Unicomp in study 1B (Ibid.245): 92.4%.
5. A "Survey God condition" where subjects filled out a survey prior to the task, rating their agreement with a series of statements in which God was described with the same formulations as Mog, Beebo and Swek in the "Super-agent condition": 76.6%

By Barrett & Kiel's own criteria, the results of conditions 1 - 3 are not significantly better than those of study 1A (Ibid 236). In the other hand, the result of condition 4 is exceptionally striking: Under this condition, anthropomorphism was almost completely erased. The result of condition 5 is less clear: Though significantly higher than study 1A, it is in fact not significantly higher than those of conditions 2 and 3.

What do these results show? (Barrett 1999: 329) interprets them as follows:

Control experiments successfully ruled out artefacts of the narratives as the cause of the differences between self-reported concepts and concepts used to process the narratives. When cognitive demands were grossly simplified, the errors disappeared

This interpretation is far from compelling. Surely, it is only condition 4 that warrants the description that "the errors disappeared". In this condition, test subjects had access to the written descriptions of Mog, Beebo and Swek during the story comprehension task. They were thus exposed to strong contextual cues to interpret the narratives non-anthropomorphically. This is entirely consistent with the view that the anthropomorphism in the other studies, and in conditions 2 and 3, was prompted by textual features.

Regarding the poorer performance in condition 5 compared to condition 4, Barrett and Keil see it as "strong evidence that the results [of condition 5] are due to subjects' applying their own anthropomorphic God concepts to the task" (Barrett and Keil 1996:237). This is indeed a

possible explanation, but so is the following: Even though the description of the supernatural beings in condition 4 and the questions regarding God in condition 5 have approximately the same semantic content, their logical force is very different. A description is simply not the same as a series of questions. That the latter should act as a somewhat weaker cue is only to be expected.

Textual cues for anthropomorphism

The number of textual features that could serve as cues for anthropomorphism is no doubt large and varied, and no comprehensive treatment will be attempted here. The following examples serve merely as an illustration. One of the stories used in the experiment reads (ibid. 239):

A boy was swimming alone in a swift and rocky river. The boy got his left leg caught between two large, gray rocks and couldn't get out. Branches of trees kept bumping onto him as they hurried past. He thought he was going to drown and so he began to struggle and pray. Though God was answering another prayer in another part of the world when the boy started praying, before long God responded by pushing one of the rocks so the boy could get his leg out. The boy struggled to the river bank and fell over exhausted.

I have already suggested that predicates like "answering" and "responded" are inherently anthropomorphic, and thus – all else being equal – cue readers to anthropomorphize God. Another important feature of this story is the use of the conjunction "Though". According to The Oxford English Dictionary "Though" expresses (1933:340)

[T]hat relation of two opposed facts or circumstances (actual or hypothetical) in which the one is inadequate to prevent the other, and therefore both concur, contrary to what might be expected.

The two opposed facts are in this instance God answering a prayer far away, and God answering the boy's prayer within a short span of time. These two facts are opposed if and only if God has one location in space, and if the time it takes to move from A to B is directly proportional with the distance between them. In other words, the conjunction "Though"

prompts test subjects to interpret the story in terms of intuitive physics, and thus to anthropomorphize God. The adverb "before long" adds further force to this prompt, in a way that a more neutral expression such as "after a while" or "three minutes later" would not. Test subjects do not anthropomorphize God because their cognitive systems are under pressure; they anthropomorphize God because they are competent language users.

That this is in fact what happens is illustrated nicely by Study 3, in which test subjects were asked to paraphrase the stories in their own words. One subject paraphrased the above story as follows (Barrett and Keil 1996:239, emphasis added):

This story suggests that God cannot listen to more than one prayer at a time, however, he will get to each prayer and answer it in time. Much like Santa Claus delivers toys to all houses in one night.

This comment illustrates another point as well. As discussed above, Barrett and Keil see the fact that it is even possible to decrease the level of anthropomorphism in test subjects' story comprehension by priming their "theological", non-anthropomorphic God concepts as "strong evidence that the results are a measure of the subjects' own concept rather than the stories' author's concept" (ibid. 232). This is not necessarily so. The above comment strongly suggests that considerations of perspective and intentionality play a role in the story comprehension process, as it unquestionably does in most real life comprehension tasks. Test subjects try to work out what the "point" of the story is, what its intended meaning is, what point of view it has and so on. In short, their "Theory of Mind modules" are buzzing away. It seems extremely likely that the priming of test subjects' theological concepts by the questionnaire in study 1C (and in study 2, condition 5) is mediated by such processes as well. Test subjects may be trying to work out not only what the point of the story is, but also what the point of the whole task is. These processes need not be reflective or conscious to affect task performance.⁹

⁹ The claim that textual features prompt tests subjects to anthropomorphize God could be tested empirically, by replicating the experimental setup of (Barrett 1998) with two or more versions of the stories: 1) The exact same stories and 2) the same stories, but with all textual cues removed. If the argument made in this essay holds, manipulating the textual cues will alter the degree of anthropomorphism in test results significantly. On the other

Theological Correctness reconsidered

The argument made here, then, is that rather than test subjects applying "their own" anthropomorphic God concepts as a default mechanism, they weigh various textual and contextual cues against each other and apply whichever concept at their disposal fits best. This might be characterized as a kind of abductive reasoning¹⁰.

On this account, intuitive ontological assumptions do not surface in the story comprehension process simply because they are intuitive; rather, they are *selectively recruited* by the task itself.

This in no way contradicts Barrett's notion of "Theological Correctness". People everywhere no doubt have multiple and often contradictory conceptualizations of their gods, and indeed "selection of the concept to be used in any given context is largely dependent on the cognitive processing demands of the task" (Barrett 1999:338). Only, we need a more sophisticated account of what these cognitive processing demands are. The ubiquity of anthropomorphic models in religion cannot be explained simply with reference to the naturalness and relative cognitive cost-effectiveness of these models. What the present argument suggests is that their ubiquity may be *causally linked* to the ubiquity of specific cultural forms such as, for example, narrative.

Comparative evidence that god-concepts vary with cultural context along parameters that have little to do with cognitive pressure can be cited from many places. The Maasai, a semi-nomadic people living in Kenya and Northern Tanzania, represent their god *EnkAi* in radically different ways in different contexts. In myth, he is represented as fully anthropomorphic, even living among men in primeval times; in traditional hymns of prayer, he is identified variously with the sky, the earth and with other elements of nature. Yet, according to Swedish historian of religion Tord Olsson, who has done fieldwork among the Maasai, none of these concepts are considered to be literally true in the context of theological reflection (Olsson 1999).

A similar, differential distribution of god concepts can be observed in Babylonian and Assyrian religion. Here, the god Girra was quite literally identified with fire in ritual contexts,

hand, it is unlikely that removing textual cues would eliminate anthropomorphism altogether as other, structural and cultural aspects of the narrative framework probably play a role as well.

¹⁰ For abduction in text comprehension see (Smith and Hancox 2001). For abduction in religious cognition more generally, see (Boyer 1994: 146-148, 221-222 and 236-242)

while in the context of narrative texts he was completely anthropomorphic (Westh 2001). Likewise, in the context of the official temple cult most gods lived in their temples, where they received daily food offerings, while in other contexts they were represented as immanent in natural phenomena, or as anthropomorphic beings living in heaven (Jacobsen 1987). Parallel cases can be cited from Egyptian and Greek religion (Olsson 1999:87-91), as well as from the Old Testament.

In the perspective suggested here, various cultural forms may act as cognitive and interactional frames favouring specific conceptual structures over others (Fillmore 1976:23). Many of these frames will obviously be culture specific, but some cross-cultural patterns will emerge as well. Particularly, there seems to be a strong link between narrative and anthropomorphism (McCauley 2000:78; Fludernik 2003). Indeed, it could be argued that humans are not so much hyperactive agency detectors as hyperactive storytellers.

The origins of anthropomorphism in god concepts

Stewart Guthrie, by positing a strong continuity between animism and anthropomorphism, gave the cognitive mechanisms underlying god concepts an extremely deep evolutionary history. Animism, in this view, evolved first as a mechanism of predator evasion; as the evolutionary pressure of human social groups intensified, anthropomorphism developed as a cognitive strategy. The mechanism of hyperactive agency detection posited by Boyer and Barrett shares more or less the same evolutionary narrative. The same goes for the other inference systems and cognitive biases thought responsible for the formation of god concepts.

By contrast, the processes of narrative comprehension discussed in this essay would be far more recent in evolutionary terms, since they are clearly dependent on both language and quintessentially cultural artifacts such as writing and storytelling conventions. Certainly, older and more primitive cognitive structures may undergird these processes, but the question remains just how radically the introduction of culture altered the parameters of human cognition. If the story comprehension experiments of Barrett and Keil have any bearing on this issue, it is to suggest that the causal role of culture in cognition is in fact a lot stronger than most cognitive theorists of religion seem to think. The view that "people's knowledge about how the gods operate does not turn on any specifically cultural content" is without empirical basis.

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