**The Role of Experience in Religion: Accommodation vs. Assimilation**

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Sterelny’s “re-explanation” of religion is rich and wide-ranging. In this brief commentary I offer a gloss on two inter-related aspects: anomalous experience and agency detection.

Sterelny suggests the “family resemblances between small world mythologies” may stem from attempts (perhaps collective attempts) to explain unusual and intense experiences. The idea, I take it, is that the nature of these experiences may have been similar across cultures, owing to shared neurochemistry and similar (albeit independently discovered) consciousness-altering technologies (e.g., psychoactive drugs, emotionally charged rituals). As a result, the explanations for these experiences (eventually coalescing into ideologies) may have taken a similar form in different cultures.

As Sterelny notes, the notion of anomalous experience is also found in the literature on delusions (Gerrans, 2014). Indeed, paralleling the argument above, the cross-cultural and historical recurrence of certain delusional forms may reflect their origin in specific experiential aberrations generated by reliably occurring (if rare) neurocognitive impairments. For example, the dominant neurocognitive account of Capgras delusion (the delusion that a loved one has been replaced by an impostor) invokes dysfunction in brain networks subserving the experience of familiarity (Darby, Laganiere, Pascual-Leone, Prasad & Fox, in press; Ellis, Young, Quayle & de Pauw, 1997). Because of this dysfunction, affected individuals have a discordant experience when they encounter those close to them (who are recognisable but don’t feel familiar), and the notion that those others have been replaced by impostors may make sense of this experience (whether the impostors are construed as doppelgängers or cyborgs may depend on the particular cultural and historical context; Gold & Gold, 2012).

Other delusions yield to similar experience-based accounts: for example, patients who misidentify their own reflection in a mirror (“That’s not me!”; Breen, Caine, Coltheart, Roberts & Hendy, 2000, p. 83) may be trying to make sense of anomalous experiences of reflected space (mirror agnosia) engendered by underlying neurological damage; and patients with severe tinnitus may come to believe they have bees buzzing about inside their heads (Maher, 1988; Southard, 1912). However, is anomalous experience sufficient to account for delusions? Although some theorists have thought so (e.g., Maher, 1988; 1999), the fact that anomalous experiences do not always generate delusions suggests the need for a second factor in delusion formation (Coltheart, 2005; Coltheart, Langdon & McKay, 2011; Coltheart, Menzies and Sutton, 2010). For example, Turner and Coltheart (2010) discuss a brain surgery patient who reported, post-surgery, that her mother *felt* different: “[T]he first thing I noticed was Mum, when she walked in the room... Just didn’t feel like her” (pp. 371-2). Nevertheless, this patient did not develop Capgras delusion. Likewise, cases of mirror agnosia have been reported in the absence of the mirror delusion (Binkofski, Buccino, Dohle, Seitz & Freund, 1999), and of course tinnitus rarely results in delusions about intracranial insects.

But what is the nature of the postulated “second factor” in delusion formation? One possibility is that the second factor involves, or produces, a bias towards accommodating direct sensory experience (Langdon & Coltheart, 2000; McKay, 2012). At the extreme, belief formation would be constrained only by direct experience, with prior expectations wholly disregarded. Bizarre experiences would always engender bizarre beliefs.

A different type of departure from rational belief updating – or a departure in the other direction – would be a bias toward assimilation (McKay, Langdon & Coltheart, 2005; Piaget, 1952). At the extreme, new experiences would be incorporated seamlessly into pre-existing schemas for making sense of the world, some of which may be shaped by evolution. Thus males may inherit a bias to interpret ambiguous female responses as signals of sexual interest (Haselton, 2003; Haselton & Buss, 2000; cf. Perilloux & Kurzban, 2015); healthy humans may share a tendency to selectively integrate evidence that is consistent with their preferences and desires (Sharot, 2011; Sharot, Korn & Dolan, 2011; cf. Shah, Harris, Bird, Catmur & Hahn, 2016); and people may be biologically predisposed to over-infer the presence or activity of *agents* (Barrett, 2000, 2004, 2012; Bloom, 2007; Guthrie, 1980; 1993).

Sterelny, however, critiques the idea that religion emerges partly as a result of an evolved tendency toward agentic interpretations of experiences. In particular, he disputes the evolutionary rationale for“hyperactive” or “hypersensitive” agency detection, whereby asymmetric costs – relatively costly false negatives and relatively cheap false positives – supposedly lead to the evolution of biased agent-detection mechanisms (Barrett, 2000, 2004, 2012; Guthrie, 1980; 1993). Sterelny is “very sceptical about the supposed cost asymmetry and its effects.” He argues that false positives in the agency-detection domain are more costly than is usually appreciated – perhaps *more* costly than false negatives (foragers “cannot afford baseless dreads”, and predators “cannot afford to give away their presence by responding to false positives”). He concludes that although agency detection was critical in forager environments, “there is no reason to think selection would tolerate cognitive designs biased in favour of false-positive beliefs about agency.”

I share some of Sterelny’s skepticism here, but for slightly different reasons. Whereas Sterelny doubts that agency-detection false negatives were more costly than false positives in the ancestral past, I question whether considerations of ancestral cost asymmetries – whichever direction the asymmetries go – can ground claims about biased beliefs (McKay & Efferson, 2010). “False negative” behavioural errors in the agency domain (e.g., failing to take evasive action when a predator approaches) may indeed have been costlier in ancestral environments than “false positives” (e.g., running away when a tree rustles in the wind); but it simply doesn't follow that humans will have evolved a belief bias in favour of false positives. *Un*biased beliefs about agency would be just as adaptive (indeed, more so; see McKay, Ross, O’Lone & Efferson, in press) if coupled with a liberal threshold for action (McKay & Dennett, 2009). In that case humans would have no bias in *beliefs* about the presence or absence of agents, but when uncertain should tend to behave *as if* an agent were present (i.e., they should err on the side of caution).

This point pertains to the theoretical case for hyperactive agency detection. But what about the empirical evidence? Here again there is reason to be cautious. Sterelny references evidence that subtle cues of agency (photographs or stylized images of eyes) affect behaviour, and also mentions our tendency to attribute agency to artefacts and abstract shapes. But how compelling are these effects? With regard to agency cues, Northover, Pedersen, Cohen and Andrews (in press) recently conducted two meta-analyses to investigate the effect of surveillance cues on generosity (the most widely studied behavior in this literature), and found no evidence of this effect. Consistent with this, Saunders, Taylor and Atkinson (2016) tested a range of monitoring cues in a large online sample and found no evidence that these cues influenced charitable giving.

As for the misattribution of intentional agency in ambiguous scenarios, what is needed is not merely evidence that humans make frequent false positive errors in this domain (e.g., attributing agency to the wind or to an abstract shape), but that people make such errors at a higher rate than they make false negative errors. New work by David Maij and colleagues (Maij, Ploeger, van Schie & van Elk, in preparation) suggests, if anything, *hypo*active agency detection – across a range of paradigms, experiments and conditions, their participants displayed a response bias against detecting agents (e.g., human agents embedded in visual noise; see also Riekki, Lindeman, Aleneff, Halme & Nuortimo, 2013). As agents were at least as likely to be present as absent on each trial in these paradigms, this response bias should yield a non-uniform distribution of errors across the two error types, with *false negatives more frequent than false positives*.

Whether this is evidence against an evolved propensity to detect agents hyperactively is unclear, because these experimental conditions may not match those faced by ancestral humans.[[1]](#footnote-1) In view of these findings, however, more work is needed to establish a) evolved hyperactive agency detection in humans; b) the contexts in which this bias manifests; and c) its contribution to religious mythology, whether small world or global. It may be that religion owes less to the agentic assimilation of ambiguous evidence than to the collective accommodation of intense agentic experience.

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1. For example, if, in the ancestral past, intentional agents were rare, then a moderate response bias against the attribution of intentional agency could still have produced a bias in favour of false-positive agency detection errors (see McKay & Efferson, 2010). [↑](#footnote-ref-1)