A need to better understand the evolutionary process of beliefs about gods' concerns

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would become increasingly important as universalizing religions come to dominate, and it would make sense for both police and universalizing deities to be concerned with obedience, without which they would lack the authority to meaningfully monitor and sanction transgressions.

While secular policing and universalizing deities may coevolve as local groups become integrated into ever larger cooperative networks, it is easy to imagine that, at some level of social complexity, secular authority may take over completely, especially if groups with different universalizing deities become functionally integrated. When that occurs, we might imagine that orthodoxy declines.

This general theoretical trajectory is necessarily preliminary, but in broad strokes it seems consistent with the main findings of Bendixen et al. in particular and with many developments in religious evolutionary theory more generally. The authors write that, "while our assessment strongly suggests that beliefs are tied to particular contexts, we have not captured their evolution in action." I would argue, though, that, once the entirety of local context is considered, particularly its relation to extended networks, their research provides a snapshot of that evolution in action. The minute details may be out of focus at this point, but the theoretical lens presented by Bendixen et al. fits neatly into existing frameworks and suggests a program of research to bring greater clarity to these dynamics.

Disclosure statement

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In their target article, Bendixen et al. (2022) make an important contribution to the scientific study of religion by offering ethnographic evidence for the role of religious beliefs in potentially solving

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important coordination and cooperation problems. Crucially, the authors show that gods' "concerns" are specific to the local socio-ecological contexts. Such findings nicely complement the existing literature on moralistic, "Big Gods" religious traditions and greatly expand our understanding of the global landscape of religious beliefs. In the present commentary, I offer some reflections on the possible explanations for their cross-cultural findings and suggestions for future work.

The authors are careful in drawing conclusions from their findings, and they make it clear that (1) beliefs about gods' concerns may not actually motivate cooperative behavior, and that (2) there is a range of possible mechanisms from which these beliefs may arise. The fact that people don't always live up to their professed belief regarding gods' concerns is important, as it implies that there may be considerable private doubts about the veracity of culturally transmitted information in human societies (Boyer, 2020). In fact, much research on religious skepticism has amply pointed out that people do not always blindly follow "received wisdom" (Goody, 1996; Purzycki & Sosis, 2019). If cultural information about gods' concerns do not reliably trigger cooperative behavior in game-theoretic settings, then adaptive explanations (e.g., cultural group selection) for the recurrence of these beliefs in diverse societies would be incomplete and unsatisfactory. As the authors point out, the evidence on the behavioral consequences of beliefs about gods' concerns is mixed, yet it seems that at least in some contexts, these beliefs do help solve cooperative dilemmas (Singh et al., 2021). Note that the much ethnographic literature seems to suggest that supernatural beliefs (not necessarily involving agentive gods) help regulate moral behavior: for example, the Azande believe that criminals could be punished by "good magic" performed by the victims and/or their kinsmen, whereas vengeance magic performed out of selfish spite would not only prove ineffectual but would turn against the magician who employed it (Evans-Pritchard, 1937). An interesting line of future work would be to investigate the socio-ecological determinants of people's degree of belief in gods' concerns (or the potency of supernatural forces in general). What are the conditions under which culturally transmitted information regarding gods' concerns is believed by the local people and therefore deters defection? The large literature on the cultural evolution of prosocial religions suggests that Big Gods religions spread across the globe largely due to the content of their religious doctrines (i.e., supernatural punishment; Norenzayan et al., 2014), which raises the intriguing possibility that there are some additional features of Big Gods religions (or societies in which Big Gods religions arise) that make the supernatural punishment claims more credible. Credibility-enhancing displays (Henrich, 2009) would be the obvious candidate here, but I believe that this is a question that deserves more theorizing and empirical efforts.

In the Appendix, the authors admit that their data allow for a number of transmission mechanisms for beliefs about gods' concerns, including content biases and manipulative signaling. Although the authors specifically suggest that spirits and gods are "difficult to disprove" and therefore "less susceptible to skepticism," many claims about supernatural punishment (which does not necessarily involve personalized deities) for rule violation and taboo transgression are empirically vulnerable at least in principle (Lee et al., 2009; Parmar et al., 2013; Sharifah Zahhura et al., 2012; Tsegaye et al., 2021), and empirical "data" play an important role in people's confidence in such culturally transmitted information (Hong & Henrich, 2021; Hong, 2022b). In a series of studies, we have suggested that the reason many individuals end up possessing factually incorrect beliefs is partially because of biased information processing and transmission (Hong, 2022a; Hong et al., forthcoming; Hong & Zinin, forthcoming). In the case of beliefs regarding supernatural punishment, it could be that instances that "fit" these beliefs (e.g., when an individual who commits a taboo transgression indeed becomes ill) get preferentially transmitted whereas instances that do not "fit" the beliefs (e.g., when nothing happens to an individual who commits a taboo transgression) get ignored. More generally, future research could pay more attention to why some beliefs about gods' concerns that are empirically falsifiable nonetheless persist in human societies. Content biases and elite incentives likely play a role, but we also need to account for the fact that individuals update their beliefs as a result of their everyday experiences.

In summary, Bendixen et al. (2022) offer an excellent starting point for an exciting line of new research on the cognitive and evolutionary studies of religion. The authors may have been a bit too careful in hedging their conclusions regarding the transmission mechanism of beliefs about gods' concerns, and I hope there will be more follow-up work that illuminates the underlying evolutionary processes.

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