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On breaking the cognitive science of religion and putting it back together again

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I first read this book while doing fieldwork in Mauritius, an incredibly socially complex multi-ethnic and multi-religious country. In this context, it becomes hard to ignore the depth with which religion is woven into all aspects of the societies we live in. Religion is closely tied to social organisation and hierarchies (Norenzayan et al., 2016), beliefs about what is right and wrong (Purzycki et al., 2021), and even how people understand cause and effect (e.g., Luhrmann, 1991). It permeates everything. When you are faced with the reality of complex religious systems out in the world like this, the edict put forth by Purzycki and Sosis – that religions both shape and are shaped by the social and natural worlds we live in and cannot be understood separately from these things – becomes impossible to ignore. With this, Purzycki and Sosis petition researchers to pay closer attention to the ecological context in which a religion is set, and its complex relationships with all parts of the social world. Across the diverse chapters, this book is a much-needed call to rethink how we approach the cultural and evolutionary study of religions and all their complexities. By isolating religions outside of their social and ecological contexts, much of the work that has been done in recent decades has given us an incomplete and potentially incorrect picture of these complex systems. Some of our theoretical approaches may even be holding us back. This book can be seen as a call for change, but the question remains, both theoretically and a practically: how do we make this change?

The book's primary opponent, and the strongest claim of things we need to change, are the theories and research stemming from the by-product view of religions. At its core, the by-product perspective claims that human have a suite of evolved cognitive capacities that have created religions as a by-product, rather than religions being functional in and of themselves (Atran & Norenzayan, 2004; Kirkpatrick, 1999; Lawson & McCauley, 1990). Specifically, religions are a by-product of cognitive capacities – such as theory of mind – that evolved for other reasons. While it is plainly true that the ability to think about supernatural minds relies on the more general ability to think about minds, and the evolution of this ability was pushed by the benefits of understanding other people's minds, not supernatural minds (thus a by-product), the argument that religions are explainable through by-products has been over extended. The belief that religions can be mostly or solely explained as a by-product of cognitive capacities is both misguided and impoverishes our understanding of what religion is and does (e.g., Barrett, 2008).

Despite the continued use of some past their prime by-product derived theories, it is not clear that anyone still holds a strict 'religion as a by-product' view, and most researchers probably never did. This is not suggesting that Purzycki and Sosis are making a strawman argument as much as saying that – given the original publication dates of many of these essays – these early chapters have already been somewhat successful in their goal. The field seems to have largely accepted that social learning, cultural niches, and explanations of the cultural functions of religion are a necessary part of explaining religious belief. Still, the by-product perspective has led to a view of religions as something that can be studied and understood as a predominantly cognitive phenomenon divorced from context. Even without a strict by-product view, many papers written on the role of cognitive biases in religion (including my own) often imply an outsized role for these tendencies than what may be

realistic (see Willard, Turpin, & Baimel, in press). The comparatively tiny role these biases may play in belief when compared to things like social learning (e.g., Willard & Cingl, 2017) need to be more prominent in the work we do. With this, the critiques held in these chapters are still presently relevant and important.

This isn't to say these by-products play no role, and that research into by-product based cognitive biases for religious beliefs has taught us nothing about religions. This is a perspective the authors also hold. Gods have minds that are often very human like (Purzycki & McNamara, 2016). The belief in souls and ghosts and any disembodied supernatural agent is probably made possible by mind-body dualism (Bloom, 2005). The consistency in religious and supernatural content around the world does suggests a tendency to fill in the gaps of our knowledge using some type of potentially universally biased thinking. At the same time, in over 30 years, there has been no research to suggest that the hyperactive agency detection device (HADD) exists (Willard, Turpin, & Baimel, in press). Similarly, the very little research that suggests a minimally counterintuitive memory bias leaves a lot to be desired and notably does not obviously support a role for this bias in religious belief (Purzycki & Willard, 2016). Maybe it is time to let these theories go.

The undoubtable progress that the by-product perspective (and the broader cognitive revolution in the study of religion that spawned it) did push was the understanding that religions happen in minds of people, and this can help us understand why some things may be universal (Sørensen, 2005). People from very diverse cultural backgrounds still shared the same evolved biology that makes us all human, and part of this sharedness is the structures of our minds. This original purpose of the by-product theories – to account for why religions exist with similar content everywhere – still stands. But here too, we have been lazy in accepting existing theories on very little evidence. Our understanding of the

universal features of religion is incomplete, as is our documentation and identification of what these universal features might be. More work still needs to be done here. Understanding what may or may not be a universal requires broad cross-cultural research based in formal theory (Muthukrishna & Henrich, 2019). It is not enough to just claim something is an evolved cognitive process, and thus universal, and then only test it in western, vaguely Protestant, samples.

Another practice of our field that the authors take aim at, albeit less devastatingly, is the decomposition of religion into easily studied parts, or 'fractionation' (Boyer & Bergstrom, 2008). Again here, the aim is is not to say there is no value in this practice – it may even be necessary – but that without more in-depth research into the complexities of the whole system, it can hamper our understanding of religion as a complex system. Fractionation is a practical approach to the very difficult problem of how to empirically study something like religion, a phenomenon that you cannot define and therefore cannot operationalise for empirical research. The solution is to take religion apart and look at the more easily definable pieces, such as synchronous behaviour in ritual or belief in supernatural agents. This is a necessary step for some of the ways we study religion, but cannot be the only way we study religion. Like the comments on the by-product perspective above, the problem exists when this is treated as *the* solution to the problem of complexity in religion rather than a small step on the way to understanding this complexity. How our fractionated pieces work in isolated highly controlled lab situations may not reflect how they work in the real world, and we cannot know this without also conducting our researching in a real-world context. Fractionated aspects of religion may not work, or not work in the same way, without other pieces of the system or a relevant context. Studying them as isolated units cannot help us understand these complexities. To understand religion

and how these pieces fit together, we need to put the pieces back together and see what a happens.

The major question that Purzycki and Sosis' critiques raise is: what do we need to do to do better? One of the solutions on offer is to focus on religions as functional, rather than a collection of by-products. A lot of great work has come out of this approach already, but like the by-product and fractionation methods described above, a similar level of caution is needed in this approach. A focus on functionalism may get us out of one trap and into another by creating an assumption that any part of religion is necessarily functional, and we can understand it's existence through that function. There is strong evidence that certain aspects of religions can be functional, from the role of moralizing gods in promoting prosocial behaviour (Lang et al., 2019; Purzycki et al., 2016) to the variety of social and learning functions of rituals (Whitehouse, 2021; Xygalatas, 2022). There is certainly a lot we can learn about the functional aspects of religion, and this is a line of research that needs to be continued. At the same time, not all parts or practices of religion (or any cultural institution) are likely to be functional. We may be underestimating the possibility of cultural drift, or chance, in determining what beliefs and practices currently exist, and I would suggest that some of the critiques of functionalism stand much more strongly than is outlined in this book. Functionalist approaches can ignore some key mechanism of cultural inheritance, and underestimate the role of social learning in maintaining non-functional or even maladaptive features (Atkisson et al., 2012). Cultural beliefs and practices, including religious ones, can become widely held and stable because of a subjective belief that they are effective, regardless of any real functional effect (Singh, in press). Searching for functions where there are none can lead us down the wrong path (see Bromham et al., 2021).

A great example here is the recent work by Ze Hong and colleagues on ritual practices in China (Hong, Ze et al., in press). Hong convincingly argues that the maintenance of rainmaking rituals for thousands of years of Chinese history should not be seen as product of a shared identity or social bonds created by the rituals, or any other functional theory of ritual. These rituals were maintained because of their perceived instrumental value; people kept doing them because they thought they worked. Though any specific rain making ritual can be shown faulty with evidence (it doesn't rain), some of these rituals will be supported with evidence (be followed by rain) by chance alone. When you live in a society where the impact of ritual on the natural world is part of your basic understanding of cause and effect, the whole enterprise of rainmaking rituals can persist through these chance temporal associations, even when specific individual rituals are deemed unreliable, and those perceived as more reliable are adopted. The enterprise of rainmaking rituals is likely to persist in this way until that entire worldview is replaced with something else. Trying to describe these particular rituals with functions commonly associated with other types of rituals would lead us down an unnecessary and incorrect path.

The most prominent call to change throughout the book is the need pay more attention to the social ecology in which religions exist, and to understand them as complex systems, both points with which I strongly agree. Yet, there is little on offer here as to how we might put all the pieces back together and study religions as complex systems. This is the only place I feel the book is lacking; it is not clear where we go from here. Complex systems require complex models. Though progress is being made in modelling and simulations of complex systems, including religious ones, this solution will not solve these issues without a substantial change to how we do the rest of our science. I am a huge proponent of basing our research on formal theories based in formal models, but formal theories are only as

good as the assumptions they make, and these assumptions are based on how we understand complex systems in the real world. Modelling the interaction of hyperactive agency detection with ritual behaviour is not going to lead to useful insights if hyperactive agency detection is not real.

I propose we start with some simpler solutions, ones that I am confident both Purzycki and Sosis would agree with. We need to get back to the age-old practice of talking to and interacting with our research subjects in the environments they inhabit, even when those participants are from our own cultures. We need to treat the cognitive and evolutionarily science of religion as anthropological, sociological, historical as well as psychological, more comprehensively than we have been, even when the people we are studying practice a familiar religion from a familiar culture, such as American Christians (e.g., Malley, 2004). Though we often give lip service to this type of interdisciplinarity, the cognitive study of religion has increasingly turned to contextless online samples to conduct research. This is, in part, a resault of the replication crisis in psychology coming to the cognitive science of religion and telling us that we need larger samples to test our theories (van Elk, 2019). This is true, but it has brought with it the movement away from face-to-face data collection *in situ*. There are much-needed places for large online samples to test our theories, but they are not a replacement for more in-depth small sample research done within a religious community. We need to sperate these types of research by their goals. Confirming findings and theories as robust and reliable phenomena requires large scale replication but creating good theories in the first place requires something else. Our theories themselves are impoverished by a lack of interaction with religious believers and ritual practices in context, and bad theories are unlikely to produce good science even when the effects are robust (Muthukrishna & Henrich, 2019). We need to get back to thinking

about *in situ* research as a means for creating and contributing to theory that can (and sometimes cannot) be tested with these larger samples. This first step cannot be skipped.

Understanding context isn't just about talking to the people in a place. It is also about understanding history, demography, culture, and ecology of those people and that place. All of this is standard in anthropology, but it's value often overlooked in the disciplinarily diverse cognitive and evolutionary science of religion. Qualitative and ethnographic research needs to go along side our large sample surveys. Smaller studies (or larger where possible) need to be done face-to-face in real places with all the complexity that brings. Universals in religion need to be demonstrated, not assumed. That doesn't mean there is no place for careful and controlled lab studies, fractionation, and computational models, but these need to be based in a more careful understanding of what religion is like for real people practicing their beliefs in a real and complex world.

From here, we may need to backtrack a bit to some of what was done in our field's past, without losing the knowledge of what we learned along the way. The brilliance of the by-product view is that it took us to a place where we recognised that religions could be studied in the minds of people, who all share the same evolved biology and thus share common traits. Fractionation gives us the tools to run careful studies on parts of a system too diverse and complex to operationally define as a whole. This is so obviously valuable to what we do. Similarly, religions have functional parts and understanding their function is a key component to understanding religion, and complex systems can behave in ways that are difficult to understand without computational models. Still, none of these methods alone is a solution and none of them will get us to a better understanding of religion without other tools. We need the combination of strategies to capture the complexity of what we are

studying, with rigor, and we need to be prepared to get our hands dirty in the field, face-to-face with our participants, even if our participants are white American Protestant Christians.

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