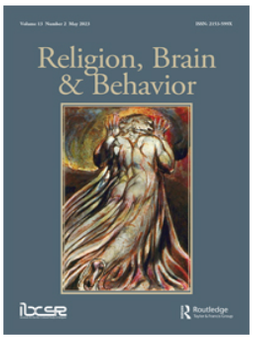

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COMMENTARIES

A systems theory of religion

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1. Introduction

In *Religion Evolving* (2022), Benjamin Purzycki and Richard Sosis, both renowned scholars in the cognitive and evolutionary sciences of religion (CESR), synthesize their mutual research programs from over the last decade to present an engaging and thoughtful argument for religion as a complex adaptive system. To be forthright, I find much of what they say valid and significant. (Knowing both scholars I'm quite prepared to make this endorsement generally; Purzycki and Sosis are prolific, their ideas are insightful, and both are wonderful scientists and equally wondrous collaborators —but I'll wait to defend *those* points elsewhere). For now, there are a few points in their book that bear expanding upon given they're importance for CESR.

Specifically, I wish to address potential challenges to their concept of the religious system. For, contrary to the scientific virtues of reductionism (Ruse, 2005, p. 793), Purzycki and Sosis (2022) argue that religion is not reducible to any fundamental phenomenon, because religion is more than the sum of its parts, whether we consider religion as a factual matter, as a concept of methodological investigation, or as a subject of theory construction. Religion is, they argue, a complex system that functions to (re)direct resources into collective acts that can inhibit selfishness among adherents and respond to environmental feedback. In so doing, religion evolves: put succinctly, a similar set of constituents emerge across contexts that in most cases work together in an environment for sustained social cooperation and cohesion, without which a particular religion would eventually break down and die (see also Sosis, 2020). These viewpoints are likely to spark excitement and debate. Respectively, a systems theory of religion has the potential to serve as an overarching framework for various research programs in CESR but also to initiate a paradigm shift away from researching religion reductively, namely as a cognitive epiphenomenon or psychological signature.

My goal in this article is to defend the religious system concept by reconstructing parts of Purzycki and Sosis' (2022) general argument for it, and thereby demonstrating the following. The religious system is descriptively holistic and consistent with prior models in anthropology; is comprehensive and conducive to methodological ethnographic research; and is consistent with systems theory in the behavioral and brain sciences. After addressing these points, I consider six particular challenges regarding the religious system that I suspect will be the focus of many commentaries, if not ongoing debates about the religious system in CESR.

2. Describing religion

Rather than defining religion outright, Purzycki and Sosis (2022) start from the anthropological observation that *religion*, albeit a fuzzy descriptor, identifies a collection of interconnected phenomena in the world that are best described as comprising a system. According to this line of thought (see also Geertz, 1973; Rappaport, 1979, 1999), religion is neither static nor reducible to a single underlying element, whether that is belief or ritual. Instead, whatever fits the family resemblance

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of *religion* in the world around us and across cultures involves a complex set of traits that incorporate neurological, developmental, affective, cognitive, and behavioral elements. Furthermore, religions foster these traits towards extended human communication through speech, symbols, and various modes of signaling (e.g., Bulbulia & Sosis, 2011). Over time, religions with these variously extended modes of communication tend to cultivate greater group cooperation and the maximization of environmental resources than otherwise. From these observations, Purzycki and Sosis (2022, p. 139) defend the view that religion is emergent, dynamic, and functions relative to an ecology (see Rappaport, 1968).

This outlook is likely to raise objections from skeptics. For in giving pride of place to religion as a system and in denying reductionism, Purzycki and Sosis seem to be reviving functionalism and begging the question of what is wrong with reductive approaches to religion. The hallmark of functionalism is focusing on the interdependence of behaviors and social structures in maintaining the survival of a system (Goldschmidt, 1966; Malinowski, 2010/1922, 2015/1954). But critics have claimed that in explaining a system's so-called *functions* or *adaptations*, functionalists tend to give pseudo-explanations that are particularly dangerous when coupled with just-so stories of evolution (Harris, 1968, p. 524). Turning to reduction, reductive approaches to religion, such as the cognitive byproduct thesis, are scientifically rigorous—presumably more so than holistic accounts—because they isolate distinct variables at microlevels for precise analyses (e.g., Barrett, 2000; Boyer, 2001; Pyysiäinen, 2001). (The skeptic may also add that contrary to its portrayal in *Religion Evolving*, the cognitive byproduct thesis posits that human psychology fosters religion at the level of populations, not individuals. Hence, the byproduct thesis is analytically but not ontologically reducible to evolved cognition).

Be that as it may, such criticisms would stand as *strawmen* depictions of Purzycki and Sosis' actual views. Their narrative avoids the pitfalls of functionalism by neither claiming that religions function only to assuage the anxieties of individuals nor do they say that the evolution of religion precludes cultural drift (random changes), diffusion (appropriation), or inventions (behavioral "mutations"). They also never claim that reductive approaches, such as the cognitive byproduct thesis, play no role in explaining the emergence of religion. Rather, Purzycki and Sosis defend a framework for an observation that is derivable from the ethnographic record: the most distinguishing feature of religion is not belief—nor is it the cognition on which religions supervene—but its flexibility (see Purzycki & Sosis, 2009). Indeed, religions are strikingly flexible. They respond to changing ecological and social conditions and therefore change over time while nevertheless maintaining a degree of constancy at their core (Purzycki & Sosis, 2022, p. 142).

Based on this observation, Purzycki and Sosis argue that when a religion survives chronologically or geographically, it is adapting to changing environments while maintaining eight constituent parts. Because these constituents provide apparent constancy and are prototypical across cultural contexts, they are what Purzycki and Sosis call the *building blocks* of religion (Sosis, 2019). They include "authority, meaning, moral obligations, myth, ritual, the sacred, supernatural agents, and taboo" (Purzycki & Sosis, 2022, p. 142). What makes these building blocks is that when they are removed from the system, the religion in question transforms or collapses. Purzycki and Sosis (2022) describe this in stark terms: shared meanings diminish in religions without authority or institutional structure; group cohesion is lost without rituals; social commitments are blurred in the absence moral obligations; moral limits are undefined without taboos; memory and memorialization fade without myths; nothing is sanctified without the sacred; and achieving transcendence is difficult without the supernatural (p. 146).

And yet, religions have the appearance of timelessness. This is due, in part, to another common set of elements identified by ethnographers, including "ultimate sacred postulates, cosmological axioms, ritual proscriptions, commandments, directives, social rules, and other religious assertions" (Purzycki & Sosis, 2022, p. 157). Under the right circumstances, these elements are maintained by religions but they, like the building blocks, are bound to change with environmental feedback (Sosis, 2019, pp. 431–439). When cooperation and coordination in a religion break down, it is

often correlated and preceded by birth declines, health deficiencies, or other negative impacts on the community (p. 434). In such circumstances, the religion becomes prone to reform, at which point reinterpretations and innovations ensue and the constituents, elements, and other features are altered, otherwise the religion will continue to decline (Purzycki & Sosis, 2022, pp. 163–165).

3. Researching religion

Just as Purzycki and Sosis (2022) draw from anthropology to break from reductionism, they propose a research strategy that attempts to integrate both experimental and ethnographic methods in studying religion as a system (and their approach is open to social simulations using artificial intelligence; see Wood & Sosis, 2019). But why a system? For Purzycki and Sosis, religion self-organizes itself given the dynamics of its underlying constituents and elements (pp. 161–162). This allows religions to initiate changes that can contribute to their survival in their respective contexts. Accordingly, religion overall is an adaptive complex or what Sosis and colleagues have described formally as *the religious system* (e.g., Alcorta & Sosis, 2005; Finkel et al., 2010; Kiper & Sosis, 2014; Purzycki & Sosis, 2009; Sosis & Kiper, 2014).

Purzycki and Sosis (2022) summarize the religious system as follows:

> By re-routing the allocation of resources into collective and other ritual acts with signaling functions, religions inhibit the kinds of selfishness that otherwise plague social life … It diverges from the view that religions are merely byproducts of human cognition; we have argued that the form, variation, and fitness returns that religions offer indicate a far more significant role in human evolution than mere epiphenomena of other adaptations would normally be expected to play. Accepting this possibility entails expanding our conception of behavioral adaptations beyond the functionally isolated cognitive systems in which the cognitive science of religion and evolutionary psychology are largely interested. Instead, we see adaptations—even those cognitive systems themselves as constellations of other sub-components. (pp. 171–172)

As with culture, religion is not static, agentic, or centralized. It is rather emergent, self-organizing, decentralized, and subject to random fluctuations and disequilibrium, despite maintaining regulatory mechanisms that cultivate signaling and various meanings for adherents (p. 4). Religion is thus alive and evolving. Consequentially, researchers can investigate predictable systemic outcomes or "what if" questions regarding changes to the constituents of religion with respect to ecology and social problems (I return to the virtue of "what if" questions in systems theory later).

Hence, a key theoretical question for Purzycki and Sosis is not what religion is but rather how it evolves. They explain that given the correspondence between religions and ecology, the evolution of religion resembles cultural and linguistic evolution. Regarding the latter, cognitive mechanisms for language are triggered by environments and individuals acquire language through interactions with conspecifics in their environment (e.g., Chomsky, 1980; Deacon, 1997; Fitch, 2010; Nowak & Komarova, 2001). For Purzycki and Sosis (2022, pp. 172–173), the same is true for religion: it originates with cognitive mechanisms but is acquired by participating in a living tradition that is culturally particular with respect to an environment. As with language, religion involves cognition *and* culture, meaning that it incorporates nearly every component of what it means to be human, ranging from genetics and neurology to history and the development of cultural niches. And just as languages evolve across time and space, so too do religions.

On a smaller scale, religions change during the average person's lifetime. This is often the case with responses to social dilemmas or ecological shifts (e.g., Smrke & Vovk, 2021; Spadaro et al., 2022; Staples, 2017). When a religious system adapts to its environment, its systemic properties can be rather exquisitely attuned. To demonstrate this, Purzycki and Sosis (2022, p. 183) refer to famous ethnographic studies such as Martu field burning, water temples of Bali, and Tyvan spirit-masters. These case studies demonstrate that religions not only change to address environmental problems but intensify cooperation to minimize collective threats (pp. 183–184).

Purzycki and Sosis therefore advocate researching religion as a CAS by conducting in-depth ethnographies and contextual experiments, as opposed to studying religion from the lab, ethnography, or

theory alone. Ethnographies that combine traditional methods from cultural anthropology, field experiments, and various modeling are likely to identify how the constituents of religion are realizable but vary across multiple cultural contexts. For example, cross-cultural studies have already discovered what people believe that supernatural agents care about, how they prompt persons to respond to those concerns, and ways that supernatural concepts promote culturally local forms of morality (p. 188). Such features are measurable against other behavioral outcomes and can thereby show whether (and how) the religious system contributes to group cohesion and cooperation.

When the reach of the religious system is considered, it becomes evident that researching religion requires multiple disciplinary tools. Purzycki and Sosis claim that studying religion as a CAS would not only capture the complexity of religion but also bring together the diverse methodologies used in CESR. For heterogenous theories that examine religion are, from a systems theory perspective, looking at different levels of the system. As such, they are not competing as much as they are complementing one another in examining various energy distributions within the system. Given the promise of CAS for CESR, Purzycki and Sosis observe that "linking facets of what [they] have been calling the 'adaptive religious system' to both greater social context and the distribution of energy within that context" could shed much light on religion (p. 189)

4. Researching religion as a complex adaptive system

There are several benefits to researching religion as a CAS. First, under the concept of the religious system, it offers consilience by synthesizing seemingly disparate research programs under a single framework (Purzycki & Sosis, 2022, p. 166). Second, it provides the means to unite environment with behavior and cognition. Third, it offers falsifiable predictions about system-wide effects—for instance, changes in a ritual's frequency should intensity or diminish cooperation (p. 169). Fourth, the logic of the religious system can account for a religion's ostensible failure or success. As an illustration, "[s]ystems that are too ordered become inflexible, like fundamentalist religions. On the other hand, complex adaptive systems that are too chaotic are unable to gain traction within an environment" (p. 159). Fifth, there is ample evidence for the religious system and thus an empirical groundwork for it.

In terms of empirical predictions, the two major outcome variables for researching religion as a CAS are reproductive success and cooperation. For instance, Purzycki and Sosis recognize that "Religions are associated with some of the highest fertility rates in the world, as well as the lowest" (p. 156). Without researching religion as a CAS, this finding is difficult to explain. Yet, if religion is a CAS, there is a guiding hypothesis. Individuals from within a religion will participate in practices and beliefs that overcome challenges in local socioecological contexts, such that religions can exploit adaptive strategies and thus maximize them, even ratcheting them up or down (p. 25). Whether this is true in all environments (e.g., declines in religion worldwide raise several questions about the extent of such claims), the concept of the religious system offers falsifiable predictions about the relationship between constituents, communities, and environment (e.g., see Lynch et al., 2022; Spake et al., 2022).

Here, I pause to consider a potential objection. Aside from raising alarms about the dangers associated with ambitious evolutionary theory (e.g., Buller, 2005; Nichols et al., 2019), the skeptic may wonder whether Purzycki and Sosis (2022) conceive of the religious system as a heuristic or as a biological reality. For it seems that holding to *biological realism* and the related claim that the religious system *is* an adaptation as opposed to *biological conceptualism* and viewing religion *as* a system is a bold position to defend. But Purzycki and Sosis do exactly that. Even though their interest at times seems to lie elsewhere (in the more moderate position that portrays the religious system as a framework; see p. 146), they often claim that the religious system is, in fact, an extended phenotype, which is selected to overcome collective action problems (p. 4).

The skeptic may dispute this claim, arguing that religion is not a phenotype subject to natural selection but a social institution (e.g., Wood & Shaver, 2018) dependent on evolved cognition.

Purzycki and Sosis (2022) would likely agree with the latter point but not the former, since the extended phenotype remains consistent with evolutionary theory and coheres with extant data on religion (for a review, see pp. 4–25). The extended phenotype is also congruent with the very idea of the religious system. For if religion is an adaptive complex, it is necessarily an extension of adaptations at multiple levels of the system. At the cognitive level, religion would exploit capacities for theory of mind (ToM), promiscuous agency-detection, memory, and information transmission biases (p. 15–18). At the behavioral level, religion would survive by making use of rituals to enact hard-to-fake signals of group commitments (p. 20). At the collective level, shared commitments would be culturally selected, and from sustained cooperation over time, cultural niches could be created by way of religion (p. 23).

In the same way, Purzycki and Sosis argue that individual-to-group and group-to-environment relationships yield several dynamic interactions and feedback loops that initiate changes at micro- and macro-levels in a religion (p. 4). Given this set of dynamics, there is no clean break between cognition, individuals, and the collective, but instead various energy flows within an environment. They call the sum total of these relationships *sacred coupling*—or the synergy most easily detected between ritual and belief in supernatural agents (Purzycki & Sosis, 2013, p. 99). Because nature has selected traits for human sociality that the constituents of the religious system exploit, the result is a cognitive niche at the collective level that extends the human capacity for cooperation at lower levels and is not reducible to a single element (see also Lang & Kundt, 2020). Put another way, religion links minds to environments (Purzycki, 2012).

But if cognition is not the centerpiece of religion, then what is? More consistently with Purzycki and Sosis' (2022) argument, what provides for sacred coupling (or bridges minds and cultures)? As explained throughout *Religion Evolving*, it is the individual. Individuals provide the religious system with energy by converting calories away from themselves and into behaviors. For instance, rituals require time and energy, but their payoff is often multi-leveled and systemic: because they offer indexical information about adherents, they serve as the central technologies for building trust and cohesion (p. 149). Yet rituals also influence the individuals who perform them, effecting their neurology, cognition, emotions, and physiology. These effects result in shared personal experiences but also the creation and reinforcement of norms that fortify the social order (pp. 83–93). Alongside the other constituents, rituals provide feedback onto both persons and groups. Thus, the individual experiences health, survival, or reproductive success on the one hand, or disease, suffering, or death on the other (p. 156).

Accordingly, we arrive at the two fundamental systemic properties of religion. When there is positive feedback onto individuals, the religion is in dynamic equilibrium and the constituents are maintained. However, when the feedback is negative, the religion is in flux and the constituents are subject to change. Taken together, positive feedback reinforces the religion's core form if not its growth, while negative feedback initiates change. Again, what this means is that religion evolves.

When considering this conclusion and the cause-and-effects of religions evolving, it's easier to appreciate why the roots of religion are individual cognition but religion in its full form is far more; religion emerges from individuals entering into states of affairs within the system that ultimately yield cooperation or disfunction. More to the point, the appearance of religion as an institution occurs with multiple individuals participating in shared rituals, moral obligations, and taboos under authorities who countenance certain myths, supernatural agents, and meanings with respect to the sacred. Changes and environmental feedback eventually effect the religious community and the conditions of individuals within it (pp. 4–6, 160–166). While these dynamics are evident over time, understanding them requires attention to complexities and adaptations within the particular religion. Thus, what Purzycki and Sosis are encouraging us to do, as scholars of religion, is shift our attention from reductionism to emergence, from one level of explanation to explaining multiple levels of the human experience, and from particularism to holism.

5. The coherence of the religious system

The skeptic may object that networks of individuals or organizations that reproduce themselves are indeed *conceivable* as systems. However, it is difficult if not impossible to identify such systems in the real world (Luhmann, 1995; Parsons, 1951). This is because religions are still reducible to traits of individuals within a culture open to the environment, while a hard system must consist of distinctively separate interacting constituents *and* be closed (Bertalanffy, 2015/1968, 4). Yet religious communities, like cultures in general, are often porous and thus open, meaning we can study them as if they were systems but in the end our analyses center on individuals in groups (Boas, 1909; as cited in Bashkow, 2004, p. 137). Likewise, the traditionalist in CSR may add that the only systems we can analyze as such are the micro units of cognition that holism seeks to replace (see also Bourdieu, 1972).

Two caveats are in order before proceeding. First, Purzycki and Sosis (2022) do not rehearse the difficulties of these views, but instead focus on articulating the religious system concept for broad readership in CESR. Second, the skeptic and traditionalist may be justified in their criticisms about the extent to which we can research living religions as systems, which I address more fully in the next section (I think there are challenges, but they can be overcome). For now, I wish to show that the religious system concept, as one that describes an adaptive complex, coheres with five necessary conditions for any patterned network or set of relationships to constitute a system.

Systems are, in the simplest terms, emergent phenomenon whose higher order functions are greater than the sum of their lower-level parts (Montuori, 2011). At the risk of suggesting that nearly everything in nature is a system, what holds a complex adaptive system together—and distinguishes it from other non-systemic units of analysis—are flows of information that improve the system's performance as it interacts with an environment (Kjosavik, 2014, p. 379). These information flows integrate the system's constituents into a purpose (a seeming teleology; see Bertalanffy, 2014/1962, 46; see also Buckle, 2003) that is beyond the individual utility of each constituent. The apparent purpose of a system is by no means obvious based solely on its constituents, and though it remains difficult to say what the behavior of any system is at some particular moment in time, its purpose is revealed in a series of events over its history (Meadows, 2008, p. 188).

Given this much, it is difficult to dismiss Purzycki and Sosis (2022) observation that religion behaves like a system. Religions are greater than the sum of their parts, and those parts bring about recurrent states that are not obvious based on any one performance at a single point in time. A function of ritual, for instance, is signaling trust, and while trust is necessary for prosociality, ritual alone is not sufficient for trust, nor would it be enough by itself to uphold a religion.

Equally as supportive of a system, the behavior of any religion at a single moment in its history reveals a spectrum of goals, ranging from economic growth, support for war, and so forth. Yet the religion's total history includes periods of diffusion, syncretism, and change in the form of revivals, reformations, and divisions that result from social and environmental changes. For those religions that survive, their historical trajectory bends towards cooperation and coordination (pp. 173–188).

Stocks and flows characterize the way systems achieve dynamic equilibrium or a state of balance (Meadows, 2008, p. 189). All systems operate on stock—or *information*—that circulates throughout the system, constituting its energy and health (Bertalanffy, 2015/1968, 41). This energy keeps the system alive; it flows into, throughout, and out of the system, responding to feedback loops (see below). According to Meadows (2008), if the sum of the stock is less than the outflow, the stock falls and the system declines; if its inflow exceeds its outflow, the stock rises and the system grows; and whenever the stock level remains the same, the system is in dynamic equilibrium (p. 189).

Returning to the religious system, Purzycki and Sosis (2022) have specified exactly what the stock is: individuals. Recall that individuals provide the religious system with its energy. This means that individuals confer the information that keeps the system alive, including signals of commitment in

the form of rituals, linguistic content in the form of myths, beliefs, and moral obligations, and other symbolic information that constructs meanings and justifies hierarchies. Thus, keeping a steady stock of individuals in a religion is arguably the central task of maintaining a religion and innovating upon it, both of which are necessary for a religion's survival (see model on p. 153).

Feedback loops include information from the environment that in function maintain or correct the system's behavior (Bertalanffy, 2015/1968, 90–91). Systemic feedback comes in two fundamental kinds: reinforcing feedback which is self-enhancing and can lead to exponential growth or runaway systems, while balancing feedback corrects the behavior of constituents and can lead to change (Meadows, 2008, p. 189). Maintenance, growth, or change occur not in spite of stock but precisely because of it, in conjunction with feedback. Feedback loops effect stock, and stocks in turn alter the system's constituents; moreover, when systems of the same stock encounter similar types of feedback, they develop strikingly analogous constituents (p. 189).

These points lend themselves to the religious system concept. Purzycki and Sosis (2022) argue that the output of the religious system is cooperation and coordination or conflict and dysfunction. These outputs are the result of environmental feedback, stock, and constituent performance. Positive feedback comes in the form of individuals experiencing health, survival and reproductive success, while negative feedback is experiencing illness, death and low fertility (pp. 155–156). Such feedback would explain the cultural evolution of analogous structures across religions such as the eight constituents identified by Purzycki and Sosis.

Oscillations and constraints are respectively systemic fluctuations within the system and the limits placed upon it, which together, and overtime, reveal the common behavior of a system (Bertalanffy, 2015/1968, 39, 166–191). Most critically, oscillations depend on feedback loops. If the feedback is strong and the stock is responsive, the constituents are altered, and the system can shift from one dominant behavior to another. However, if the feedback is weak, the system can remain in equilibrium for a relatively long period (Meadows, 2008, p. 190). Equally as critical, constraints are energy limits. While a system could in theory grow infinitely, no environment is limitless: systems are limited by the amount of energy available to them and will therefore oscillate with energetic changes in the environment (p. 190).

If the religious system concept is designed with any systemic components in mind, it is oscillation and constraint. Elsewhere Sosis and colleagues have modeled the religious system as having both a reinforcing feedback loop that drives maintenance or growth and a balancing feedback loop that drives decline or change (for a review, see Sosis, 2020, 2019, 2016). These loops represent the critical relationship between environmental constraints and the behavior of constituents and its stock (Purzycki & Sosis, 2022, pp. 160–166). (It is worth noting that a narrative thread in *Religion Evolving* that I do not have the space to explore here is the suggestion that it is possible to draw on the fourteen features of CASs to address how religions self-organize in a decentralized manner with shifting environmental constraints. Such a development would indeed represent a significant contribution to the study of religions as systems).

Hierarchical arrangement is a fundamental characteristic of emergence within any system. After emerging from lower orders, higher order levels of a system "serve the purposes of the lower levels" (Meadows, 2008, p. 190). When systems have hierarchical arrangement, they respond to feedback and exercise what may be called *memory* in striving for equilibrium and diversifying as an adaption to a local environment (Davidson, 1983, p. 159).

Purzycki and Sosis describe the religious system as having three nested orders. The core is the collection of individuals entering the religion and giving it energy. Above individuals are the eight constituents that shape the space of behaviors for persons in the religion. The third level are shared behaviors and social norms. Given this hierarchical structure, individuals within Purzycki and Sosis' schema are primary, and the higher orders of the system—social norms and constituents—serve the needs of individuals. Even though it is the group level that interfaces most directly with the environment, the feedback loops are nevertheless experienced by individuals in the form of positive energy extraction or energy depletion.

6. Additional challenges and replies

The religious system concept is thus consistent with systems theory. Still, one large issue remains: although religions are analyzable as CASs, and the religious system concept is a useful analytical framework to that end, the application of the model to living religious communities is likely to generate debate. Therefore, I would like to offer what I regard as a collegial and potentially collaborative thought experiment to consider with Purzycki and Sosis.

Imagine that in some part of the world there is a sports team comprised of young adults who are entirely devoted to their religion, let us call that religion "R" for sake of simplicity. Let us say too that this team and its players attend a school centered entirely around R and only for persons devoted to R, which is one of several R schools in a town of people who mostly identify as R. Further, the town itself is located in a region that is populated by other R communities, and though its neighboring regions vary in terms of religious composition, they live within a nation state whose main religion is R. Further still, these various R communities are part of an international church organization for global R. Imagine as well that on average, people in R have higher birth rates compared to most other communities. Yet, some groups within R suffer more than others such as women and lower-ranking individuals who are mandated to serve others. My questions are: which one of these communities is the religious system and how do we conceptualize particular experiences relative to generalizations about the religion?

We may be tempted to say that each R community in the above scenario is its own religious system or that they all operate together within an overarching religious system. But either answer leads to problems. Specifically, I can foresee the religious system facing six potential challenges:

The boundary problem is determining where the religious system begins and ends. Addressing the boundary of a system is necessary for identifying endogenous, exogenous, and excluded variables. Endogenous variables are internal to the system and respond to feedback as parts of the system's internal dynamics, exogenous variables are within the system but respond to the core endogenous variables, and excluded variables are outside the system in the environment (for a review, see Ford, 2009). Would, then, the international organization of R be an exogenous variable with respect to an R town or village of R practitioners, or would it be endogenous? If endogenous, what then would be the environment—the entire planet? If exogenous, what separates the constituents as practiced by the local religious community from the international religion and potential variants therein? Equally, the questions concerning where the system begins and ends applies to every instance of R raised above, from the sports team to the international organization.

The plurality problem is demarcating multiple systems that operate within an apparent global system. It is perfectly plausible that the above religious communities constitute multiple agents in themselves who at times cooperate and coordinate with one another but at other times conflict and oppose one another's goals. If each represents a system, do we need to demarcate multiple competing systems or many systems within a single religious system, ranging from the local to the international? But notice that either conception raises the question of whether we can call any of these tokens of religion *the* religious system—for instance, would we need to designate a particular religious community as *a* religious system in itself that reflects the ideal type of *the* religious system? That is to say, is the religious system realizable in any context of religion? If so, would the religious system not be a concept as opposed to a biological reality?

The stock problem follows the boundary and plurality problems. It asks whether the same information flows through an entire religious system that, in turn, encompasses multiple communities or whether it flows through each variant individually. Based on Purzycki and Sosis (2022), the stock of the religious system is the collection of individuals in the religion. However, if different communities of the same religion are distinct systems given their disparate environments (e.g., Muslims in Detroit vs. Fulbe Muslims in the Cameroon), then the stock for each would be the local participants. But if that is true, why would the same logic not apply all the way down to distinct religious congregations or sports teams. Returning to the above thought experiment, if different towns or villages

of R make distinct systems, then congregations of R within a single town would also be distinct, provided they didn't share the same stock. The same would be true for a sports team of R whose members were isolated from other R groups in a town or region. However, this leads to a paradox of migration: for instance, let us imagine Muslims moving from (say) Detroit to Cameroon, would they now be in a different system? On one level, it would seem so. But given their status as Muslims, it would seem they were still in the same religious system.

The culture problem is differentiating religious from cultural systems. Based on the constituents of the religious system, it is difficult discerning what is religion and what is culture. After all, cultures bear similar properties to the religious system, including (arguably) constitutions that resemble the building blocks of religion, the output of cooperation or dysfunction, and feedback loops (e.g., Situngkir, 2004). The problem becomes more apparent considering the previously mentioned thought experiment. We may be tempted to say that the global church of R is more of a culture while the local community is closer to a system. But this would beg the question of where the religious system ends and a different cultural system begins.

The sports problem is separating sport from religion using a systems approach. If religion and culture are difficult to separate, then aspects of culture will be equally as difficult. To illustrate, sports closely resemble religion (e.g., Alpert, 2015), but so too do political movements (e.g., Kiper, 2023, 2012). Should we say that these are quasi-religious systems—and if so, what makes them quasi-religious and not religious? Elsewhere Sosis and I have argued that in the case of sports, it is meaning-making (Sosis & Kiper, 2022) and in the case of political movements it is the over sanctification of power (Kiper & Sosis, 2022). Yet the challenge to these respective claims is that sports may in fact parallel religion more than we have initially presumed, and that religious powers throughout history have also over sanctified power. Hence, separating religion from both culture and other institutions may require further and more detailed investigations.

The disadvantaged problem is explaining cooperation at the cost of internal dysfunction or even exploitation of a subset population. If overall cooperation and coordination improve within a system but that accomplishment is achieved by disadvantaging a minority, can we still describe the system as cooperative? In short, more attention should be given to the kind of cooperation and exploitation in religions to explain the necessary and sufficient conditions for systemic cooperation and coordination in living religious communities.

Despite my anticipation that others will raise similar critiques, I do not think such inquiries discredit the current model but invite clarification. However the religious system model is clarified or reformulated, it will remain a helpful model for at least a few reasons. First, the religious systems framework provides a pathway forward for investigating certain scenarios involving religions and testing the model itself. As Meadows (2008) observes, "System dynamic models explore possible futures and ask 'what if' questions" (p. 190). The value of the religious system concept, I think, depends *not* on whether it captures every part of an actual religion, but whether it can predict or explain patterns in living systems. Second, the boundary and plurality problems may prove to be moot points because the world is, after all, a plurality of systems—it's probably not inaccurate to describe the world as systems all the way down, such that there is no separation but instead a continuum of systems. Thus, where to draw the boundary, how to answer the query of just how many systems there are, and what separates systems is up to the researcher to determine.

Finally, I wish to offer a potentially provocative suggestion that the religious system *concept* is a model, and that everything we think we know about the world is a model or, for lack of better words, cognitive schema of the world. While some models are better than others, our cognitive schemas are not the world itself (p. 190). Hence, the value of the religious system is not whether it exists ontologically but whether it conceptually helps us investigate religions and likewise other systems such as sports, political regimes, or culture writ large. Consequentially, I may take a different route but I reach the same conclusion as Purzycki and Sosis in finding great value and promise in the idea of the religious system.

7. Conclusion

To support Purzycki and Sosis even further, I would like to close by juxtaposing their theory to the alternative paradigm in the cognitive science of religion by asking: why is religion a human universal? According to Purzycki and Sosis (2022), the byproduct thesis posits that religion is universal and everywhere corresponds to robust cultural institutions by virtue of stories that exploit evolved cognition. Yet this does not explain why religions maintain similar constituents; something that a systems theory of religion can explain. As Purzycki and Sosis observe, the religious system adapts and varies according to socioecological conditions and historical developments (p. 171).

Whether the religious system concept gets adopted by scholars or the byproduct thesis remains the paradigm, Purzycki and Sosis' defense of the religious system entails two implications, which I consider significant for CESR. The first is that in light of Purzycki and Sosis' argument, it is difficult to maintain that religion is little more than psychological outputs. I consider this Purzycki and Sosis' *minimal claim* since it is perhaps radical for the cognitive science of religion but is a long-standing view in anthropology (e.g., Geertz, 1973; Rappaport, 1999). The second is that the religious system is an adaptation and thus that evolutionary accounts of religion must involves multiple levels, ranging from cognition to culture. I consider this their *maximal claim* because it breaks from prior systems theory in cultural anthropology (e.g., Bateson, 2000/1971) and the social sciences (e.g., Vallacher & Nowak, 2007) where systems are closed fields of interaction, and instead purports that the religious system is an adaptation that exploits other lower-level adaptations.

Regardless of a minimalist or maximalist break in the scientific studies of religion, the religious system is a contribution articulated in *Religion Evolving* (2022). As I've attempted to show here, it is a concept that involves predictions that are falsifiable, rendering it a sound scientific construct. According to Purzycki and Sosis, researching the religious system is also akin to investigating language, since the cultural evolution of religion is likely to resemble linguistic evolution (pp. 14–22, 101–127, 148–166). Specifically, interactions with conspecifics in local contexts should activate underlying cognitive devices or domains for acquiring schemas (perhaps in some kind of Bayesian sense) for religion just as persons acquire language (pp. 172–173). And if the religious system is indeed an adaption, then particular religions ought to respond to social dilemmas, such that shifts occur within communities towards cooperation to address environmental threats (pp. 183–184). As with many claims in *Religion Evolving*, these are bold predictions and push CESR in the direction of studying religions as systems, with relatively new insights about cognition and adaptation.

The final point I want to reiterate about Purzycki and Sosis' systems account is that it is conducive to anthropology and encourages scientists of religion not to limit themselves to studies in the lab, but to engage in or draw from ethnography, models, and simulation (see also Wood & Sosis, 2019). Such holism is inherent in any systems approach, and in the case of religion, it lends itself to treating religion as a CAS—or, now in a name, thanks to Religion Evolving, studying *the religious system*. According to Purzycki and Sosis (2022), the religious system, as a model, both synthesizes and can guide recent movements in CESR, and as a system in nature, the religious system interlinks religious activities within environments that can only be appreciated through holism (p. 189). Thus, I believe Purzycki and Sosis have advanced studies of systems in anthropology and provided a bridge for connecting various approaches in CESR. For this and many other reasons, *Religion Evolving* is an excellent book that will be valued by scholars across the sciences.

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