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Multifunctional religious systems and perturbed dynamics of psychological wellbeing

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Kevin Flannely presents an ambitious book that connects evolutionary approaches to the study of human psychopathology with the study of various facets of religious beliefs, revealing comprehensive correlational evidence for the buffering effects of religious belief against mental disorders. The author has my full support in applying evolutionary theories to the understanding of human psychology and, especially, psychopathology, which is not yet as common as it could/should be. As Flannely shows, evolutionary theory has a great potential to improve our understanding of mental disorders by revealing how various disorders spring from evolved cognitive mechanisms or are a sign of their dysfunction. In this commentary, I will focus on the problematic aspects of correlational evidence presented in the target book and suggest ways to disentangle the causal relationship between religious beliefs and mental health by implementing the theory of dynamical systems (Strogatz, 1994).

Correlational evidence has an important role in pointing out associative relationships between variables but its well-known inability to support causal claims prevents scholars from asking important questions about the relationship between religious beliefs and mental health. In the target book, religious belief was mostly treated as a static, trait-like variable with a positive or negative valence that has either positive or negative effects on mental health (e.g., unpleasant afterlife beliefs were negatively correlated with mental health). However, this approach neglects the question why some people hold positive or negative beliefs and, more importantly, this approach ignores possible changes in religious beliefs over time, which may reflect individual trajectories of mental health. There is ample evidence that religiosity varies across the lifespan (Chan, Tsai, & Fuligni, 2015; Kirkpatrick, 1997; McCullough, Enders, Brion, & Jain, 2005; Stoppa & Lefkowitz, 2010) and some of this variation may even be associated with the onset of generalized anxiety disorder in women (Maselko & Buka, 2008).

Thus, the correlational evidence amassed by the author does not allow us to decide whether religious beliefs indeed have a positive/negative impact on mental health or whether the valence of religious beliefs just mirrors other personal characteristics or traits that are responsive to adversity (or some other confounding variables). I believe that the author is well acquainted with this issue as he presented a few longitudinal studies and experimental designs that may help tackle the causality issue. However, while studying such single-cause linear relationships is a good starting point, it is insufficient to account for causal nonlinear dynamics inherent in any complex system such as the individual human being (Young, 2016); and this problem only exacerbates when we posit the individual amidst complex cultural systems like religions (Sosis, 2017). Translated to the interest of the current commentary, we can understand, in a simplified way, wellbeing as a state of an individual's internal bio-psychological system that is responsive and adaptive to environmental challenges. This individual system interacts with other individuals to perpetuate more complex social systems such as religions, which can, in turn, exert influence back on the individuals. Accounting for this feedback relationship between individual and religious systems may help us disentangle some of the causality issues related to religious beliefs and mental health, given two basic assumptions.

The first assumption is that shocks to the bio-psychological system caused by adverse events (e.g., natural disasters, death of a loved one, severe illness, lost meaning of life) manifest as psychological distress, which, if untreated, could destabilize the system toward various anxiety disorders. From an evolutionary point of view, psychological distress facilitated by the Evolutionary Threat Assessment System (ETAS; chapter 14 of the target book) may be adaptive in motivating people to avoid

potential threats and other hazards. Its long-term overactivation or hyper-functionality, however, may lead to severe impairment of the whole bio-psychological system (Flannelly, 2017, p. 280; Sapolsky, 2004), and potentially to mental-health problems mentioned in the target book (for simplicity, I neglect other important variables like genetic predispositions, family history, and personality traits). Second, I assume that the intensity of religious beliefs fluctuates during the lifetime (see above), and that such fluctuations may be detectable even over shorter time periods, for instance, religious holidays. For decades, the scientific study of religion has examined the dynamics of religious conversion (Gooren, 2007; Lofland & Skonovd, 1981; Paloutzian, Richardson, & Rambo, 1999; Stark & Bainbridge, 1980), but here I argue that the intensity of religious beliefs may vary over different frequencies (over the lifespan, a liturgical year, or sudden events) without the necessity of major shifts like conversion. Together, these two assumptions allow for both the psychological distress and the intensity of religious beliefs to vary over time, and importantly, to co-vary under the influence of external and internal variability that generates destabilizing shocks to the bio-psychological system.

Based on these two assumptions, the main thesis of this commentary is that whenever the individual bio-psychological system is perturbed out of its equilibrium by adversity, religious beliefs are recruited as a coping mechanism that pushes the individual system back to stability. That is, psychological wellbeing is a form of homeostasis in which the bio-psychological system thrives, and destabilization of this wellbeing is dampened by increased energy investments into religious beliefs. By intensifying thoughts about gods and other devotional expressions like prayer, believers may recruit personal and social resources to cope with distressing events and bring the bio-psychological system back to the wellbeing equilibrium. Whenever this equilibrium is reinstated, the increased energy investments into religious beliefs should cease to baseline levels, exhibiting the typical pattern of negative feedback loop dynamics (Carey, Mansell, & Tai, 2014). While scarce and heterogeneous, there is preliminary evidence supporting this proposition.¹

For example, previous studies have manipulated mortality salience, finding that death anxiety increased belief in gods for both religious and non-religious participants (Jong, Halberstadt, & Bluemke, 2012; Norenzayan & Hansen, 2006). A subsequent study challenged or supported participants' religious beliefs, revealing that the latter decreased death anxiety, measured both explicitly and implicitly (Jackson et al., 2018). Furthermore, increasing uncertainty heightened participants' belief in spiritual control (Kay, Moscovitch, & Laurin, 2010), and religious beliefs have been shown to buffer against error-related negativity (a proxy for distress) generated by the Stroop task (Inzlicht, Tullett, & Good, 2011). In a related strain of studies focused on ritual performance (rather than beliefs), Lang et al. have found that psychological distress prompts repetitive and rigid ritual behaviors (Krátký, Lang, Shaver, Jerotijević, & Xygalatas, 2016; Lang, Krátký, Shaver, Jerotijević, & Xygalatas, 2015), and Sosis and Handwerker have shown that repetitive recitation of psalms helped Israeli women to cope with anxiety from air strikes (Sosis, 2007; Sosis & Handwerker, 2011). Similar results have been obtained during the Indian rituals of Holi and Navratri (Snodgrass, Most, & Upadhyay, 2017; but see Lang & Sosis, 2017). Finally, evidence from large-scale surveys suggest that religiosity indeed fluctuates around naturally occurring adverse events. Sibley and Bulbulia (2012) have used the New Zealand Attitudes and Values Study (NZAVS) to show that in the aftermath of earthquake that hit Christchurch, New Zealand, this region experienced increased rates of religious conversion (primarily to Christian churches). In a similar study of 600 subnational districts across the world, incremental risk of earthquake was associated with increased belief in gods and afterlife (Bentzen, 2015) and in Canada, human losses during natural disasters increased the intensity of belief in religious participants (Zapata, 2018).²

Whereas these studies are somewhat supportive of the general claim of this commentary, none of them provide direct evidence regarding the feedback relationship between psychological distress and religious beliefs. Laboratory studies offer great control over simple causal relationships, yet they do not allow us to study naturally occurring feedback loops between religious beliefs and mental health. Furthermore, religious beliefs are notoriously difficult to manipulate in the laboratory. The field has

attempted to activate religious concepts mostly by employing priming methodology (reminding participants of various religious concepts), studying the effects of primes on short-term cooperative exchange and prosociality (Lang et al., 2016; Shariff, Willard, Andersen, & Norenzayan, 2016; Xygalatas, 2013). However, this methodology has been criticized (Gomes & McCullough, 2015; van Elk et al., 2015) and works mostly on participants who are already religious. Despite fruitful attempts to solve this issue (Jackson et al., 2018), laboratory experiments offer only limited understanding of religious dynamics.

The macro-level longitudinal studies, on the other hand, offer great insights into naturally fluctuating levels of religious beliefs but are often too coarse-grained (with gaps of several years between data-collection waves) and/or unable to capture individual-variance in adversity. Thus, to test the hypothesized negative feedback loop relationship between religious beliefs and mental health, the field needs individual-level longitudinal data capturing temporal variation in the intensity and/or content of religious beliefs and its relationship to various adverse events. Using surveys with fine temporal resolution together with ethnographic observations should provide desired control over the tangled causality in the fluctuating levels of psychological distress and religious beliefs. Moreover, employing portable physiological measures that assess distress such as continual measurement of Galvanic Skin Resistance (GSR; Xygalatas et al., 2018), salivary levels of cortisol (Snodgrass et al., 2017), or telomers shortening (Zahran et al., 2015) offer promising venues to non-invasively assess continuous fluctuations in physiological distress, adding a much needed physiological component to the studied system (Xygalatas, 2015).³

Nevertheless, the proposition to study negative feedback loops between religious beliefs and mental health does not account for another important finding presented by Flannelly: the fact that negative religious beliefs have adverse effects on psychological wellbeing. For instance, belief in punishing god is negatively associated with self-esteem (p. 302), and belief in harsh god decreases happiness via symptoms of anxiety disorder (p. 190). That is, while I suggested that religious beliefs may be recruited as a coping resource during the times of adversity, for some people, certain aspects of religious beliefs seem to even worsen the distress symptoms. These results directly contradict the predictions put forward in this commentary. To sketch possible reasons for such findings, I will treat different aspects of religious beliefs as a part of multifunctional religious system (Purzycki & Sosis, 2009; Sosis, 2017), in which beliefs nonlinearly interact with other components (e.g., taboo, rituals, myths) to create an array of individual- and group-level effects. That is, the homeostatic concept of psychological well-being is just one of multiple simultaneous states that the individual bio-psychological system calibrates in order to adaptively function in the environment.

For example, it has been hypothesized that belief in punishing and harsh gods is an important evolutionary mechanism stabilizing cooperation among anonymous unrelated individuals (Norenzayan, 2013; Norenzayan et al., 2016), and a recent cross-cultural study showed that it is solely the belief in monitoring and punishing gods that predicts fair treatment of distant co-religionists in an economic game (Purzycki et al., 2016, 2018). Thus, the fear mechanism together with reputation sensitivity may be recruited through belief in harsh gods in order to regulate normative conduct; however, the same belief processes may dysregulate psychological wellbeing by stressing the role of fear and punishment, bringing the whole bio-psychological system to the edge of disorder.

This proposition is in line with debates about the usefulness of the homeostasis concept in dynamical systems with multiple simultaneously running regulatory processes (Berntson & Cacioppo, 2007). Instead of homeostasis, researchers have proposed the concept of allostasis (McEwen & Wingfield, 2003; Sterling, 2012) in which different homeostatic set points are negotiated between subsystem, resulting in a trade-off equilibria (e.g., increased blood flow to muscles during exercise at the expense of kidneys). The homeostatic parameter of each subsystem is constantly changing in relation to other subsystems based on the brain's predictions (Clark, 2013; Friston, 2009) in order to facilitate adaptive responses to upcoming challenges (McEwen & Wingfield, 2003; Sterling, 2012). Thus, the intensity of belief in gods and their various aspects may result from a trade-off between the need for wellbeing facilitated by loving and supporting gods on one hand, and distress from fearsome gods

that motivate people to behave normatively on the other hand. Since this trade-off constantly adapts to environmental challenges, at some critical point (given personality risk factors), the system may bifurcate into anxiety disorder (Hardy, 1996; Stewart & Peregoy, 1983), in which gods' negative aspects become pressed too hard at the expense of the loving aspects. Modeling the control parameters of bifurcation into anxiety disorder may be yet another fruitful area for future research.

In summary, the evolutionary approach to the study of mental health proposed by Kevin Flannelly is instrumental in the understanding of the human bio-psychological system and its reciprocal relationship to religious systems manifested at the social level. The target book leaves a little doubt that there is an inherent connection between religious beliefs and mental health, a fact that I aimed to elaborate by introducing dynamics into the otherwise static concept of belief. While I offer only a little empirical support for the propositions made in this commentary, I hope it can serve as an inspiration for future experimental studies.⁴

Notes

1. Note that from the perspective of the complex social systems, it is difficult to isolate the specific effects of religious beliefs from the multiple interconnected elements that co-create the religious system (Sosis, 2017). Whenever possible, I use the term religious beliefs to keep the commentary close to the target book; however, the purported effects of religious systems on psychological distress are multifactorial (including specific ritual behaviors). Hence, I present available evidence relevant to the broadly construed religious systems. Moreover, other theories such as the meaning-making dynamics (Park, 2010; Park & George, 2018) include religious coping as an important facet of an individual's global meaning.
2. I presented general findings from the selected studies in a simple linear fashion where adverse events prompt religiosity but some of these studies show also an opposite effect of adversity on religious beliefs, i.e. apostasy for some participants. While this is mostly a minor effect and I do not wish to complicate this commentary too much, it is worth noting that for some people, too much adversity may signal a lack of divine governance. Predicting who is more likely to convert/intensify belief and who may de-convert after distressing situations should be a fruitful area for future studies.
3. The ideas presented in this paragraph were developed together with Dimitris Xygalatas.
4. I would like to thank Tomáš Hampejs for useful discussion of ideas developed in this commentary.

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