Religious Experiences Are Interpreted through Priors from Cultural Frameworks Supported by Imaginative Capacity Rather Than Special Cognition

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Abstract

In this commentary of McCauley and Graham's book on mental abnormalities and religions, we identify a number of challenges, and present possible extensions of their proposed research. Specifically, we argue that no specialized religious cognition should be assumed, and instead suggest that the cases of mental abnormalities discussed in the book specify particular instances of religious content, and that other disorders may show a more causal relationship to religiosity. We argue that the discussed religious content may be best explained in the context of cultural frameworks and their contribution to experiencing the world through priors and predictive processing. Moreover, cognition required to understand and engage with religion, but not special to it, might crucially involve our capacity for imagination, supported by memory. Disorders in imagination are therefore expected to show likewise dysfunctions in religious phenomena.

Keywords: Cognitive Science, Religion, Mental disorders, Cultural frameworks, Predictive processing, Imagination

Introduction

In *Hearing Voices and Other Matters of the Mind*, McCauley and Graham discuss a relatively neglected but extremely important topic of similarities between religious phenomena and mental disorders (McCauley & Graham, 2020). They are to be congratulated for investigating this topic with care and the required depth. The examples they picked to illustrate their point, such as the depression of Mother Teresa, or the scrupulosity of Martin Luther, speak to the imagination and make the religious experiences real to the readers (even if some examples, like Martin Luther's, may border on the overly speculative). McCauley and Graham also champion a highly interdisciplinary approach, as is necessary for the topic at hand, reflected in their "ecumenical naturalism." In doing so, they also advance the meta-theoretical framework of the Cognitive Science of Religion (CSR), which we wholeheartedly embrace. Indeed, complex phenomena such as religious experiences are best approached by a synthesis of multiple levels of investigation (Lang & Kundt, 2020). Notwithstanding the benefits of such an approach, a multilevel investigation of religious phenomena also presents important challenges for researchers, some of which are manifested in the work of McCauley and Graham. We discuss these challenges and provide suggestions for future research.

Naturalism and Religious Cognition

McCauley and Graham frame their inquiry into the relationship between mental disorders and religious phenomena as "ecumenical naturalism." Ecumenical naturalism combines earlier propositions by McCauley and Bechtel (2001) regarding explanatory pluralism of cognitive sciences with philosophical naturalism. Such a combination lays a solid meta-theoretical foundation for their investigation without the need to reduce religious phenomena to pathological manifestations of the human mind (*sensu* Freud, 1907). That is, ecumenical naturalism allows McCauley and Graham to investigate how "many features of religious

experiences rely on maturationally natural cognitive processes that underpin much of ordinary mental life" (McCauley & Graham, 2020, p. 28). However, while arguing that religious experiences are facilitated by "ordinary cognition" (p. 5), McCauley and Graham also maintain a concept they call "religious cognition," rendering it unclear what exactly religious cognition is, if not simply ordinary cognitive systems engaging with religious content. While we agree that neurocognitive mechanisms underlying religious phenomena likely did not evolve for this reason, putting forward a concept of religious cognition may confuse the reader to thinking that McCauley and Graham suggest that there is a special type of cognition dedicated to religion, which by their own admission, McCauley and Graham claim not to do. This potential confusion is exacerbated by the fact that the book intentionally focuses on specific religious flavors of mental disorder (labelled "religious disorders" in the book; e.g., scrupulosity), which again suggests an impairment in specifically *religious* mental mechanisms.

Taking a hard stance on the non-existence of true religious cognition creates somewhat of a problem for the main goal of the book, which is to explore the continuity between religious cognition and specific cognitive structures impaired in patients suffering from depression, obsessive-compulsive disorder, or individuals on the autistic spectrum (Figure 1.1, p. 3). According to McCauley and Graham, this approach should serve to inform both our understanding of religious experience and of mental disorders. The former (research on mental disorders informing the CSR) can indeed be reached if we assume that religious cognition is just ordinary cognition. Examining the neurocognitive mechanisms that underlie mental disorders expressing hyper- or hypo-religiosity should help us better understand mechanisms facilitating religious experiences.

However, the latter goal (religious experience informing the research on mental disorders) is more equivocal until we assume the existence of actual *religious* cognition. While we agree

that there are interesting similarities in certain features of religious experiences and mental disorders and highlighting them bears merit, sometimes, the similarities appear tenuous and depend on religious *content* rather than religious cognition that could enrich our understanding of the underlying neurocognitive mechanisms. It is difficult to see for example what researchers on depression can learn from, for instance, the particular case of Mother Teresa when not assuming specific neurocognitive mechanisms related to her religious conviction.

The main underlying cognitive mechanism that is considered shared between "religious" and "ordinary" depression is a strong sense of abandonment, whereby a previously felt connection or attachment is felt lost, which results in desolation, feelings of unworthiness, and ultimately, depression. While this clearly can underlie both cases of "ordinary" and "religious" depression, it is not clear that a lost connection to the Christian God is cognitively different from a connection to a close loved one. A relationship with the Christian God has been likened to, and explained by, the *attachment theory* (Granqvist, 2020; Granqvist, Mikulincer, & Shaver, 2010), whereby God takes a place much like a parent would, who, when disappointed or disapproving of the individual's actions, may retreat their affections and attention. If God and God's love features in someone's life as a human person and their love, then the loss of such presence and love would be (at least) equally devastating. Thus, while there may be a common underlying cognitive mechanism – for example processes of attachment – McCauley and Graham have focused on the content instead: loss of a connection to God instead of a human loved one. Again, this helps elucidate the mechanisms facilitating relationships to supernatural deities but likely not the mechanisms of depression.

Chapter 2, on hearing voices, is another example of how the discussed cases of mental disorders may be explained by religious content rather than religious cognition. At the core of this chapter lies the argument that hearing voices and other forms of hallucinations may not

be considered a disorder or pathology if it is not accompanied by other symptoms of mental disorders such as schizophrenia, if frequency and duration are low (a recurring argument in the book that we agree with) and if there is narrative or social support. Cultural expectations influence how people represent their experiences as voices or inner speech or thought (Luhrmann, 2012), for example through narratives (van Mulukom, 2017). Religion clearly provides a cultural framework by which the phenomena can be understood, but also shaped: thoughts formulated in words make available the objects of narratives ("language processing"; McCauley & Graham, 2020, p. 63). They become both available and accessible: "People's specific interpretations of their experiences are made more probably by (among other things) how culturally imaginable or readily available the interpretations or descriptors are" (p. 60). This means that religion is not associated with a special type of cognition to interpret the world with, but rather a cultural framework. By way of simile, the voices one hears may be in German or French, or in secular or religious "language."

Mental Disorders and Religiosity

Establishing that McCauley and Graham refer mostly to religious content, we suggest that there are other disorders, which may be particularly enlightening to hone in on mechanisms *required* for religion, rather than mechanisms merely *involved* (cf. brain lesion studies, like Cristofori et al., 2016).[1] For example schizophrenia, which is discussed in Chapter 2 in the context of auditory verbal hallucinations, is associated with religiosity in a more general way (Gearing et al., 2011). A crucial aspect of schizophrenia is abnormal dopamine signaling, which may lead to (psychotic) experiences with *aberrant salience* (Kapur, 2003). Dopamine release is implicated in the "stamping-in" of memories that attaches motivational importance

[1] Aside from a potential underlying shared mechanism between schizophrenia and religiosity, there is also important research suggesting that, depending on the culture, religious/spiritual coping may be beneficial for adherence to treatment in schizophrenia (Gearing et al., 2011).

or salience to otherwise neutral environmental stimuli (Wise, 2004). If dopamine contributes to a feeling so unusual but also significant that it is often interpreted as "sacred," then it may be a crucial factor in religious experiences (Deeley, 2004; Geertz, 2010).[2] If this hypothesis holds true, then one would also expect that, conversely, abnormally low levels of dopamine are associated with *hyporeligiosity* – and this is indeed the case. Patients with Parkinson's disease – a disease marked by low levels of dopamine – frequently experience reductions in religiosity (Butler, McNamara, Ghofrani, & Durso, 2011; McNamara, Durso, & Brown, 2006). This suggests that cognitive abnormalities can inform us about aspects of religiosity without the need to claim that dopamine is a religious chemical or the only mechanism facilitating religious experience, for that matter.

Furthermore, there are other cognitive abnormalities directly related to changes in religiosity that may be of interest, namely epilepsy. While the research on the connection between epilepsy and religious experiences initially allured many researchers to speculate about the presence of this disorder in important religious figures (Dewhurst & Beard, 1970) or make simplistic claims about the god part of the brain, we believe that a careful and informed interdisciplinary research on epilepsy can be extremely fruitful. Indeed, epilepsy may be associated with sudden personality changes, which can include changes in religiosity (Hansen & Brodtkorb, 2003), thus creating an opportunity to investigate whether the cognitive mechanisms that are affected by epilepsy are causally involved in religiosity (or in cultural frameworks more generally).

However, even if a disordered brain-mechanism related to epilepsy may be crucial for facilitating religious experience, a cultural framework enveloping these experiences is still crucial. The ictal experience (i.e., during a seizure) can involve a variety of ecstatic

[2] It has been suggested that imagistic religious rituals induce dopamine release with referentially open stimuli (Deeley, 2004) the interpretation of which needs a referential framework.

sensations, including sensory hallucinations and erotic sensations (Hansen & Brodtkorb, 2003). On closer inspection, some reported experiences include common religious components, such as feeling a presence, hearing voices, and receiving messages (Hansen & Brodtkorb, 2003). Therefore, it may be the case that people experiencing these phenomena have heard about these phenomena before, but only in a religious framework (regardless of whether they themselves are religious), and therefore are prone to interpret the experience as such.

Cross-Cultural Variation in Religious Cognition and Content

Our argument that McCauley and Graham focus mostly on the religious content of mental disorders that is crucially dependent on specific religious contexts suggests that this issue would best be investigated cross-culturally. For instance, it would be interesting to examine whether some psychopathology is more likely to be cross-culturally associated with religious contexts, but this goes beyond the goals of the McCauley and Graham book. Indeed, despite acknowledging that religion can "colour" experiences through the cultural framework it provides, the focus of the book is heavily biased toward monotheistic – and in particular, Abrahamic – religions, which is sometimes called out (p. 78) but not always (p. 91). In the light of the discussions of narrow sampling in psychology and related fields (Henrich, Heine, & Norenzayan, 2010; Sears, 1986), we believe that the conclusions offered by McCauley and Graham are limited by the overt focus on the U.S./Christian populations.

While we do not want to discuss at length the need for understanding religion outside of the so-called WEIRD (Western, Educated, Industrialized, Rich and Democratic) populations (Newson, Buhrmester, Xygalatas, & Whitehouse, 2020), we would like to highlight the possible drawbacks of implicitly assuming that one type of religion is "prototypical" (McCauley & Graham, 2020, p. 79). In the field of linguistics, a paradigmatic shift took place

when Chomsky proposed the concept of generative grammar (Chomsky, 1957), introducing a theoretical framework through which all languages could be analyzed and their universals unveiled. This proposition revolutionized linguistics, similar to how the study of religion was revolutionized by the inception of the CSR. However, Chomsky took English to be the default or prototypical language, from which the grammars of other languages diverged. Regardless of the historical inaccuracy of English even being close to a proto-language, this means that all kinds of cognitive operations had to be postulated to fit non-English languages (essentially, coming from non-WEIRD populations) in the same underlying cognitive grammar. For example, he postulated that in languages where "wh-" question words ("what", "where", etc.) do not appear at the beginning of a sentence, would move "covertly" (i.e., in one's head outside of conscious awareness, not in spoken or written language) to the beginning of the sentence for syntactical operations to be presumed equal across all languages (Chomsky, 1995), despite there not being an *a priori* reason or a reason based on cognitive principles for the wh-words to appear at the front of the sentence. The CSR has done well to embrace the diversity of religions but it is important to continue relying on ample cross-cultural and comparative work when studying universals to avoid potential biases related to using one religion as prototypical.

Moreover, understanding the cultural evolutionary history of particular religions (i.e., the historical processes that formed religions under various socio-ecological conditions (Lang & Kundt, 2020; Sosis, 2020) could help us elucidate why religious content may be more typical for some disorders than others in particular social systems. For example, some religious traditions may include harsh, punitive, and omniscient deities that help to stabilize cooperation among anonymous co-religionists (Lang et al., 2019; Norenzayan et al., 2016;

Purzycki et al., 2016).[3] While such beliefs play important societal functions and are favored by cultural evolution, they also non-trivially interact with "maturationally natural capacities" and may cause distress and anxiety from fearsome gods (Flannelly, 2017). On the other hand, the cultural evolution of omnipotent deities may also have important by-products, for instance, the belief that such omnipotent deities can help people in difficult situations. One study of participants in the extreme ritual of the Thaipussam festival in Mauritius showed that painful acts of devotion celebrating Murugan (a Hindu god of war) was associated with later improvements in participants' self-reported well-being (Xygalatas et al., 2019; see also Tewari et al., 2012). These examples suggest that mental health may be affected by specific religious settings in complex, non-linear ways (Lang, 2020).

Predictive Processing and Priors

Cultural frameworks such as religions further influence phenomenological experiences as do individual differences in cognition (e.g., the capacity for absorption). For example, whether the boundary between self/other or inside/outside the mind, is "porous" rather than "bounded" varies between individuals and cultures (Luhrmann et al., 2021; see also McCauley & Graham, 2020, p. 52). Whether the boundaries are porous or bounded determines whether a person is thought to be able to receive thoughts, emotions, or knowledge directly from outside sources (such as through telepathy or divine inspiration). This means that beliefs may differ interculturally prior to even having an anomalous experience such as hearing voices. In other words, different religious traditions would provide different priors for their adherents to interpret their unusual experiences (in a predictive coding or processing framework; Clark, 2013), which would affect the specific

[3] In this respect, we found the argument that some traditions (e.g., Protestantism) may push their members further on the psychopathology continuum (e.g., in scrupulosity) intriguing and see this as a fruitful intersection of the CSR research with cultural evolutionary theories.

manifestations of particular disorders. The extent to which religious concepts are woven to the everyday fabric of life in various cultures would create differently strong priors for the top-down generative models in the minds of particular religionists (Taves & Asprem, cf. Lang & Kundt, 2017) and impairments in the self-monitoring capacity may be more readily populated with religious concepts in some cultures over others (Fletcher & Frith, 2009). That is, priors such as a religious framework or other socially supported interpretation can help frame the event into a religious experience. Crucially, these priors would affect whether individual cultures encourage or stigmatize psychological abnormalities.

While McCauley and Graham discuss this process of "background beliefs and expectations" influencing interpretations in the source monitoring section of Chapter 2, they do not refer to predictive processing explicitly. We suggest that the predictive processing framework can provide a more parsimonious explanation for the discussed phenomena (van Elk & Wagenmakers, 2017) than source monitoring, which we argue is more closely involved with assessing the status of the thought (i.e., derived from external or internal sources; Johnson & Raye, 1981), and to which we return below. Indeed, the effect of degraded inputs or bottom-up signals, whether due to external circumstances (e.g., unreliable sensory signals due to low levels of lighting, etc.) or internal circumstances (e.g., trauma) has been suggested to be an opportunity for religious interpretations, or top-down priors, to sweep in (Schjoedt et al., 2013a, 2013b). Besides a reduced reliability of bottom-up signals, an increased reliability of top-down priors, such as the presence of material religious artefacts, can further steer the experience (Clark, 2013).

Imaginative Capacity Underlies Religious Representation

Despite the caveats of the previous sections, we believe that McCauley and Graham would agree there are neurocognitive mechanisms not *dedicated to* religion but *required for*

religion. In the current section, we will argue that imagination may lie at the center of religious beliefs and behaviors, and may be at the foundation of such cognition (van Mulukom, 2019), and suggest some possible extensions for the work that McCauley and Graham have put forward.

The ability to imagine a god is a recurring underlying theme in Chapter 2, 3, and 5: The ability to hear the voice of God is supported by practicing one's imagination; a reduced ability to "imagine" the presence of God is associated with depression; and the inability to imagine other minds is associated with reduced religiosity in individuals on the autism spectrum. Imagination defined as the cognitive capacity to simulate mental representations in the absence of external input shares with religion its involvement with content that "transcends the here and now" (van Mulukom, 2019). Given the transcendental nature of religion, we argue that the capacity for imagination is a prerequisite for religious experience (regardless of the ontological status of supernatural beings, places, and so on). In other words, imagination is at the core of the ability to engage fully with religion. We now investigate whether mental disorders with religious content have similar abnormalities in imaginative ability.

Pentecostalists engage in certain prayer techniques such as imagining oneself talking to God and imagining observing the church from God's point of view to increase their feelings of connectedness to God (Luhrmann, 2012). Such practice increases the ease of imagining over time, which in turn contributes to plausibility or felt realness of the experience (Tversky & Kahneman, 1973, 1993; see also, van Mulukom et al., 2015). The process by which thoughts are assessed has also been called source monitoring or reality monitoring (Johnson & Raye, 1981). Importantly, reduced source monitoring, such as in individuals with high levels of fantasy proneness or absorption, may cause imaginings to appear more real (van Mulukom, 2020). Higher levels of perceived realness can in turn influence beliefs following

from religious experiences. Scrupulosity might be an instance of this – the thought-action fusion entails that thoughts are thought real to the extent that they can be perceived as actions in of themselves. This can prove debilitating, especially when combined with rumination, or an excessive simulation of (imaginary) threat.

Besides individual differences, excessive belief in the imaginary ("delusions") is crucially manifested in mental disorders such as schizophrenia. When the imaginary, that is content that transcends beyond the here and now, is no longer perceived as such and is considered as real, we might call this "hyper-imagination." Conversely, "hypo-imagination" refers to impaired ability to imagine (for a similar framework, linking mental disorders to creativity, see Flaherty, 2005). McCauley and Graham suggest that in the case of hypo-imagination, it becomes impossible for the individual to feel God's presence. Indeed, since the Christian God is faceless and invisible, imagination is required to invite His presence during prayer. However, depression compromises imagination (Williams et al., 1996) and reduced or blocked imagination during prayer means that no connection to God can be made, plunging the praying individual into feeling abandoned by God, which in turn further reduces the ability to imagine in a vicious cycle.

Theory of Mind, like future event imagination, relies on autobiographical information and involves imagining an alternative perspective to one's own perspective in the here and now (Buckner & Carroll, 2007). Autism, in this sense, may be considered a deficit in imagination as well (see also Roth, 2007; though cf. Visuri, 2019). McCauley and Graham point out that autistic individuals may develop an "ersatz" Theory of Mind by systemizing their social experience, in particular in terms of social conventions rather than psychological insights about other people's minds. This ersatz theory is a factual representation of what might have happened without the requirement of an imagining of another person's mind. A similar distinction might be made between semantic and episodic memory: whereas the former is the

storage of factual information, the latter involves storage of remembered personal experiences including an experiential aspect through which the imaginer can relive the experience (Tulving, 1985b). Indeed, autistic individuals display a similar deficit in episodic memory as compared to semantic memory (Crane & Goddard, 2008), as do individuals with depression (Williams et al., 1996), suggesting an important role for (the feeling of) experience (or "autonoetic consciousness"; Tulving, 1985a).

Given that religion requires a capacity for imagination to represent gods' minds (Purzycki & McNamara, 2016), it would stand to reason that religiosity is impaired in autistic individuals. However, it has also been argued that in religions with bodiless supernatural agents, religion might be easier for autistic individuals, as they do not have to engage with full persons (Visuri, 2018), and can, as it were, create them in their image. However, due to this increased idiosyncrasy, such religiosity does not always get picked up by studies of religion (Visuri, 2020).

Furthermore, weaved throughout the book is an underlying tenet that a coherent, stable *sense of self* contributes to mental wellbeing, whereby an interruption of this sense of self is connected to mental disorders (Waters, 2014). A healthy sense of self or identity is crucially supported by *narrative*, which weaves one's past, present and future together into a coherent whole (McAdams, 2001), stored in and accessed from autobiographical memory. Through their support of identity, narratives are crucial for psychological wellbeing (Baerger & McAdams, 1999), and deficiencies in narrative or identity are associated with psychopathology (Neimeyer, 2000). However, contrary to McCauley and Graham (McCauley & Graham, 2020, p. 99), we argue that narrative thought comes naturally and automatically (Bruner, 1986) and is required for the establishment of an identity (McAdams, 1993, 2001). These narratives are ways of telling ourselves and others who we are (i.e., our identities), and

religiosity can be an important part of that. Religious rituals, especially high-arousal ones, can contribute significantly to such narratives (van Mulukom, 2017).

To conclude, in so far that one of the main functions of autobiographical memory may be to provide the building blocks for imagination (Schacter & Addis, 2007), and that narrative and other social constructions may rely on imagination (van Mulukom, 2020), we do not have to postulate additional cognitive systems to account for religious experiences. In Chapter 2, McCauley and Graham explicitly propose five cognitive systems that may underlie hearing voices: source monitoring, language processing, agency detection, Theory of Mind, and "penchant for narrative." Of these, we have covered all except for agency detection and showed that the capacity for imagination, supported by memory, plays a crucial role in all of them. In the interest of space, we will not contribute further to the agency detection debate (in the CSR), and will simply agree here that it is likely that humans are "naturally poised to detect intentional, purpose-driven agents" (McCauley & Graham, 2020, p. 63), and suggest that this may be another (predictive) prior influencing human perception (cf. Andersen et al., 2019).

Conclusions

How cognition supports religion and religious thoughts and behaviors has been the target of decades long research. In their book, McCauley and Graham examine an under-investigated corner of that research: the overlap between cognition in mental disorders and cognition involved in religion. In this article, we have put forward caveats as well as possible extensions of their research proposal, in particular referring to cultural frameworks, predictive processing, and imaginative capacity. The interaction is a rich and fascinating aspect of cognitive science, and we applaud McCauley and Graham for bringing so many interesting aspects together into a coherent book.

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