

A critical evaluation of the cognitive science of religion and its contribution to the field of religious studies, up to and including the present.

Introduction

This essay seeks to critically evaluate the contributions that the cognitive science of religion (CSR) has made to the field of religious studies up to, and including, the present and potentially beyond. I will draw on an eclectic mix of interdisciplinary research and resources, much originating in the west from the late 1800s (Darwin 1859; James 1902; Hardy 1979; Newberg and d'Aquili 1999; Andresen 2001; Boyer 2002; Pyysiäinen and Anttonen 2002; Hick 2006; Yaden and Newberg, 2022) and probably, from the east, much earlier (Bodhi 1993). To distil the value of this approach in helping to explore and explain religion and associated experience I will take a specific focus on one particular individual, George Fox, who, inspired by a revelatory vision, a formative epiphany, became one of the major founders of the Quaker movement (Ambler 2007).

First, an overview of the development of cognitive science and CSR is presented alongside Fox's vision, his developing mission and his impact on the formation of the Religious Society of Friends. This provides an opportunity to highlight CSR's contribution to the field of religious studies and provides a basis from which to critique the value and virtue of CSR alone in explaining the origin and nature of personal religious and spiritual experiences. Next, current trends within and around the field are suggested offering a more integrative way of researching, interpreting and explaining religious practice and spiritual experience which lean toward a more constructivist, embodied and acculturated way of exploring past and present religious development and lived spiritual experience. To conclude a summary overview is provided.

The development of CSR aligned to George Fox's vision, mission and impact

The development of CSR

CSR studies how mental processes and religious expression interact with regard to, but not exclusively with, religious concepts and behaviours, mental processes, cultural forms, rituals and memory systems, together with how this contributes to our perception, ongoing evolution and lived experience. It has been influenced by several disciplines including religious studies, cultural and cognitive anthropology, cognitive, evolutionary biology, psychology, philosophy, neurology, neuroscience, and now neurotheology, embodiment theories and consciousness studies. It continues to evolve as a significant field in its own right, is adaptative, informed by empirical research, evaluative of personal and collective experience and practice and is helping to advance our understanding of individual religious experience, shared and divergent belief systems, and the ongoing perpetuation of the religious in daily life.

George Fox and his vision

George Fox (1624-1691) was very much inspired by his faith, his father was a church warden, and yet he was unsettled by much in the tradition as it was early post-reformation and up to and during the English Civil War (1642 – 1651). He is reported to have broken off an apprenticeship as a shoemaker, troubled by depression and

melancholy and spiritual restlessness. Encouraged by friends to drink, smoke and sing, he gained no solace and instead spent much time in isolation and contemplation, travelling across the Midlands of England, conversing with clerics, in a hope of addressing his 'malady' but to no avail (Oxford DNB, 2025). He became very anti-clerical and a challenger to many as he searched for answers to how and why Christianity was as it was in the 1600s. There is much more to say on Fox that sits outside of this study. Most important here is that within this man, something was at play neurologically, psychologically and theologically, and at this time of unrest, both within him and without, Fox experienced several religious experiences which deeply affected him and led him on a mission which eventually resulted in the establishment of the Religious Society of Friends, the Quakers. The most significant, experienced after a climb up Pendle Hill, Lancashire, in the spring of 1652 is reported in his journal, as follows.

"I saw there was none among them all that could speak to my condition. And when all my hopes in them and in all men were gone, so that I had nothing outwardly to help me, nor could tell what to do, then, oh, then, I heard a voice which said, 'There is one, even Christ Jesus, that can speak to your condition;' and when I heard it my heart did leap for joy. Then the Lord let me see why there was none upon the earth that could speak to my condition, namely, that I might give Him all the glory; for all are concluded under sin, and shut up in unbelief as I had been, that Jesus Christ might have the pre-eminence who enlightens, and gives grace, and faith, and power. Thus when God doth work, who shall prevent it? and this I knew experimentally." (Fox 1647 in Britain Yearly Meeting 2013: 19.02).

This experience, and its impact on Fox and others, is the basis from which I now explore the field of CSR.

Early psychology and neurological science

James (1902) is arguably the first published academic who drew on psychology and neurological studies to explain the cause of religious experience. He suggested that religious experiences could be studied scientifically as expressions of individual consciousness. James comments directly on Fox as someone who, from his perspective, was a 'psychopath', someone known to be,

"... liable to obsessions and fixed ideas; and frequently they have fallen into trances, heard voices, seen visions, and presented all sorts of peculiarities which are ordinarily classed as pathological... Often, moreover, these pathological features in their career have helped to give them their religious authority and influence.... Yet from the point of view of his nervous constitution, Fox was a psychopath or *détraqué* of the deepest dye. His Journal abounds in entries of this sort." (James 1902; 6).

James' thinking and feeling, in part, aligned with Freud (1913) viewing religion as a cultural byproduct of our human psychology, much of it subliminal, emanating from our subconscious fears and desires. The added value of cultural influence suggests that Fox's psychology, with his potentially pathological fixations and possible psychopathy, placed him in a unique position, and that his religious epiphany, for a man seeking something more from faith, was a result of concurrent factors, way beyond his own and others comprehension at the time.

James (1902) did develop a typology for the varieties of religious experience, latterly augmented by others (notably by Yaden and Newberg 2022), which does help in some way to classify the nature of experience outside of any necessary scientific analysis. He arrived at four major thematic areas; ineffable - beyond words and cannot be accurately described; noetic - some kind of knowledge or insight; transient - temporary; passive - it happens to the person, and the person doesn't make it happen. For Fox, on Pendle Hill, his vision would have been noetic, and arguably his searching, internally and externally, made it more of a likely occurrence than a passive one.

Evolutionary theory and The Quaker Movement

Developing from Freud's concept of religion being a cultural byproduct, evolutionary theory, inspired by Darwin's seminal work (1859), has been adapted and developed by individuals such as the sociologist Émile Durkheim (1912) and the evolutionary biologist Julian Huxley (1927) and can help to explain something of the social and cultural change the Quaker movement was born from, inspired by Fox and his vision. Durkheim examined religion as a social phenomenon that helps to sponsor community cohesion and shared morality while Huxley sought to connect religious behaviour to evolutionary advantage. The connection between CSR and evolutionary biology has more recently been further explored in Norenzayan (2015) which linked the belief in moralising deities to the rise of large, cooperative societies. Whether or not the Quakers initiated something of an advantage for themselves and others, as Huxley implies, can be debated with many early Quakers were persecuted, isolated from the mainstream, left to find their own employment, and outlawed from gathering for worship (Quaker Act 1662).

Cognitive approaches to understanding religion

In the mid-20th century there seems to be a more obvious shift toward the use of cognitive approaches to help in understanding religion. Piaget (1929) and Vygotskij (1978) highlight the developmental and socio-cognitive processes that underpin our formation of belief. Fox, keen to maintain a journal for many years, highlighted his own cognitive processes at times illustrating confusion and vulnerability, at other times, clarity and insight.

Boyer (2001) offers interdisciplinary insights from cognitive science, anthropology, and evolutionary psychology that help explore the reasons for our development and maintenance of religious beliefs. He argues that by being "minimally counterintuitive", religious beliefs become particularly memorable and compelling. Revisiting Fox, he did, in part, become counter-intuitive. He went from seeking without to finding something within "and when I heard it my heart did leap for joy." This turn-around, subtle and minimal, became central to his preaching and to the Quakers.

Building on the work of Guthrie (1993), Sperber (1996) and others, Boyer (2001) argues that beliefs, like Fox's, occupy a 'sweet spot' in human cognition. They are counterintuitive enough to grab attention and stand out making them memorable and worth transmitting, yet intuitive enough to allow others to cognitively, and perhaps in an embodied way, process, understand them, and respond accordingly. There is some

suggestion from Boyer (2001) that these counter-intuitions are close enough to existing collective and shared cognitive processes that they can be spread within community and across generations. Again, in initiating support, generating interest from others, maintaining his own commitment to his faith, and eventually creating a break-away religious community, Boyer's suggestion of the minimally counterintuitive bringing powerful leverage to initiate change holds credibility with Fox.

Several known cognitive mechanisms contribute to supporting Boyer's ideas. Agency detection, being hyper-sensitive to detecting agents we attribute cause and effect to unseen forces such as supernatural beings. This mechanism, further developed by Barrett (2004) as *Hyperactive Agency Detection Device* (HADD), similar to the idea of projection (Psychology Today 2024), was perhaps at play for Fox as he saw 'that of God in everyone.' HADD is believed to have evolutionary benefits, survival being one. For Fox, and his focus on seeking the truth, he was struggling to survive his own mental distress and depressions. Theory of mind, another cognitive mechanism, is where our ability to attribute thoughts, feelings, emotions and intentions to others underpins our beliefs in the ability of supernatural forces such as gods, angels, spirits to be in relationship with, and impact on, ourselves. Fox's Pendle Hill vision and his journal account typify this as he attributes his experience to God. We have a tendency, across all cultures, to anthropomorphise, and this metaphorical construct can impact on our cognitive relationships with others and the world around us (Guthrie 1993). Memory and attention bias suggest that minimally counter-intuitive ideas are more likely to be remembered and shared and so can become culturally embedded and transmitted over time (Boyer 2001).

Boyer's promotion of these cognitive mechanisms certainly helps explain something of the mental processes at work within Fox's thinking and behaviour. Whether they can account for the content, his belief in his experience being of divine intervention, or not, remains unfathomable, and yet definitely plausible as a part of his meaning making. Whilst agency detection, theory of mind and memory and attention bias can all be seen to be operative, and arguably generative within the brain so creating experience, they do not discount the fact that they may also be stimulated by something outside of the self, be that a known trigger, something unseen, or from Fox's personal perspective, the divine.

Cognitive Science of Religion

Expanding Boyer's ideas Whitehouse (2002) studied how cognitive factors interact with social practices to sustain religions while Henrich (2009) has explored how religious beliefs can promote cooperation and group survival and so helps to connect Boyer's ideas to broader evolutionary theories. Arguably the early Quakers, inspired by Fox's vision and subsequent teachings, created very intense meetings for worship using silence, especially when contrasted with the then more prevalent church service, a Catholic mass in Latin. Further, Whitehouse (2004) conceptualised *modes of religiosity* differentiating *doctrinal* from *imagistic* modes of religious transmission, reinforcing the role of memory and ritual intensity in shaping religious systems which together with learning as,

“a recursive process and input systems that dynamically interact with internal cognitive processes progressively produce more explicit and consciously accessible understandings” (Whitehouse 2002; 138).

Fox may well have reinforced his implicit memory and behavioural mastery and through this worked with the world with his own unique mystical Christian bias.

Atran (2002) explored how cognitive processes, combined with evolutionary pressures, make religion adaptive for social cohesion. Fox's state, in advance of his hillside vision, may certainly have been influenced by extant pressures of the day, as society adjusted to the impact of the reformation and lived through the civil war. The shift in focus from viewing religion as a purely social or cultural phenomenon to understanding it as an outcome of evolved cognitive processes occurs within space and time, not outside. Our cognition is also not in isolation. It is a product of need, desire, both reactive and proactive, within community and environment. Uniting cognition with society and culture does highlight something of how a vision, a very internal experience, unites with an external society and extant culture. By identifying religion's cognitive foundations, Boyer's theories help to explain something of Fox's experience and subsequent behaviours and actions. But, as others note, it is not a one-way street, cognition is both a response to and an agent on self, others and the wider environment.

Pyysiäinen (2002) examined how the counter-intuitive elements of religion challenge our everyday understanding of the world facilitating the transmission and persistence of religious beliefs across generations while Guthrie (2002), previously arguing that religious experience emerges from dispositions to overgeneralise agency (Guthrie 1993), explored the evolutionary origins of animistic beliefs, proposing that humans have an innate tendency to attribute agency and intentionality to non-human animals and inanimate objects. This cognitive bias, rooted in our evolutionary history, leads to the perception of spirits and deities inhabiting the natural world, forming the basis of many religious systems and cognitive constraints shape the structure and form of religious rituals with participants' cognitive capacities influencing competence in performing and understanding rituals, leading to the development of ritual forms that are both cognitively manageable and culturally transmissible (Lawson and McCauley 2002). Quaker worship is simple. Meet in silence, speak from the silence, close in silence.

Anttonen (2002) revisits the question of the origins of religion by identifying the generative cognitive mechanisms that give rise to religious thought with cultural and environmental factors producing the diverse religious expressions observed across human societies. Integrating insights from both cultural and cognitive analyses, offers a more nuanced perspective on how religious beliefs and practices are formed, maintained, and transformed within societies (Jensen 2002). Bulbulia (2007) suggests that the first wave of cognitive research on religion began with an appreciation of human imperfection, implicitly suggesting a second wave is coming. Early proponents understood that natural selection has the power to build intricate psychological architecture. They also understood that this power is constrained. He notes that,

“Culture matters to how we understand and engage with the world and each other. Yet psychologists have discovered that many features of cognitive processing and

development closely resemble the function and growth of biological organs... The perception and inference engines that guide us through hostile reality need to operate quickly. And for invariant aspects of our world, richly structured and rapid cognitive processing can emerge in a lineage without strong external scaffolding.” (Bulbulia 2007: 623)

For Fox, culture and the radical changes he and others saw in society, politics and the organisation of religion would have been a strong influence on his worldview, cognition, emotional state and behaviour, and yet he initiated something counter-intuitive, radical in itself, with little external support or ‘scaffolding’. Perhaps his vision was a conscious observation of his own rapid cognitive processing and at the heart of this man’s world the machinations of thought, feeling and behaviour were being driven, in part, by cognitive processes.

Current trends, challenges and future developments

Currently, parallel to the growth of cognitive science as a multidisciplinary approach, neuroscientists, now equipped with scientifically validated evidence from brain research, psychology, psychopharmacology and improvements in imaging technologies imaging techniques, began to explore the neural basis of religious experience. More empirical in nature, neuroscience has helped to identify, quantify and qualify what and how cognitive processes occur within the brain, both as generative internal occurrences and as responses to external stimuli.

Penfield (in Leblanc 2019) is often cited as one of the first to work on electrical brain stimulation in epileptic patients and so to study the brains responses and resulting effects mentally and emotionally, even spiritually. In the 1950s his research revealed that certain brain regions, when stimulated, evoked intense spiritual feelings, paving the way for later neurotheological research. His later work on the expansion of the interpretive cortex sought to explore and explain *déjà vu*, and whilst not conclusive, it would seem that there are miscommunications between short-term and long-term memory which create the sense of having already experienced a situation.

In their studies on the neuropsychological basis for religion Newberg and D’Aquili (1998) seek to identify causal neurological mechanisms that help sustain religion across time. Focusing on the brain and its support in our perception of reality they argue that it fulfils both a self-maintenance and a self-transcendent function and that the mechanisms are deeply rooted in the way the brain is able to perceive reality in various states of arousal. At one level of a sliding scale there is a baseline reality that can be perceived and at another level, the other end of the scale, a reality they typify as that of Absolute Unitary Being (AUB).

“Therefore we must conceive of the brain as a machine which operates upon whatever fundamental reality may be and produces, at the very least, two basic versions. One version is a world of discrete beings, usually base- line reality, and the other version is Absolute Unitary Being (AUB), usually experienced as God. Both perceptions are accompanied by a profound subjective certainty of their objective reality. Whatever is prior to the experience of either AUB or the baseline reality of everyday life is in principle unknowable, because what is in any way known must be translated, and in this sense transformed, by the brain.” (Newberg and D’Aquili 2019: 200).

Later, Newberg and D'Aquili (2001) demonstrated how religious experiences correlate with specific brain activities, such as reduced activity in the orientation association area (OAA) during meditation, leading to a sense of unity. Their research complemented earlier work by Persinger and Koren, whose "God Helmet" experiments in the 1980s (Persinger et al 2010) suggested that stimulating the temporal lobes could induce spiritual experiences. However, these are contested by Granqvist et al (2005) who argue that suggestibility has something to do with the induced phenomenon of mystical presence. Spiritual experiences involve pronounced shifts in perception and buffer the effects of stress on mental health. Of note Miller et al (2019) provide mechanistic accounts, using novel imagery scripts to prompt spirituality responses in test subjects to see how these changes may occur at neural levels and yet again are challenged by Stoddard (2020). It would seem the use of technology to understand the religious and the spiritual creates more problems than proofs.

However, Geertz (2000: 203) challenges the singularly scientific approach believing that it "renders both the question of the social habitation of thought and that of the personal foundations of significance untouched and untouchable" and Bowie (2013) would argue that cognition alone is not enough and that imagination and empathy are also required if we wish to truly engage with our research subjects. Fox certainly had empathy and imagination when he preached to his early audiences (Britian Yearly Meeting 2013).

Integrating an advanced understanding of psychology, psychiatry and neuroscience and a more client centric interdisciplinary approach Yaden and Newberg (2023) revisited James' seminal work. They sought to identify triggers, to assess psychological impact, to understand the cognitive processes and neural correlates and to advance a theory of neurotheology as a way forwards. They surmise that James believed that the religious within us, our association with it, and the cause of religious experiences occurred out of the fullest light of consciousness... on the margins of consciousness, subliminally. Perhaps then, as for Fox, it is this area of the subliminal, where often we need metaphor to explain thought and feeling, that results in our using whatever words we have to understand our own experience and relate it to others. For so many, the religious and the spiritual in life is hard to put into words and if it is occurring at the margins of consciousness, maybe the construction of metaphor using our pre-requisite knowledge and experience, is the best we can do, to help comprehend and communicate experience and meaning.

Their characterisation and classification of spiritual experience expands on James' classification and now includes six thematic areas, each with some potential to overlap others: Numinous Experiences (Encountering Divinity); Revelatory Experiences (Voices, Visions, and Epiphanies); Synchronicity Experiences ("Everything Happens for a Reason"); Mystical Experiences (Unity and Ego-Dissolution); Aesthetic Experiences (Awe and the Sublime); Paranormal Experiences (Ghosts, Angels, and Other Entities). And yet, while classification and labelling can help with categorisation, I am unsure if they help in supporting a deep understanding of the causal factors for religious and spiritual experience, unless of course between categories these may differ.

CSR is likely to be challenged by, and perhaps over time assumed into an even broader multi-disciplinary approach, possibly an integrated framework or even a unifying theory including new contributions from embodiment theory, neuroscience and ecology where religious beliefs and practices can be studied as emergent conscious and unconscious process, products and by-products of our psycho-socio-cultural interactions at both neurological and cosmological levels. Religious thought, belief, feeling and practice are, after all, a result of embodied responses, actions, reactions and interactions, often aligned to environmental, social and cultural contexts, with seasonal changes, scheduled celebrations, ritual and rites emanating from our biology, history, neurology, physicality and psychology in relationship with the wider world and beyond.

Future developments, such as ‘neurotheology’, a term first coined by Aldous Huxley in his novel ‘Island’ (1962) and now adopted by Andrew Newberg, is an emerging subject area connecting neuroscience and religion that seems to be respectful and inclusive of our inherent cognitive and relational ability to develop shared religious beliefs and practices is the idea of neurotheology.

Winter and Granqvist (2023: 1) propose *religiospiritual* cognition as a term to express the role of embodied cognition in religious and spiritual experience integrating attachment theory as a cognitive and embodied mechanism to help explain an individual’s attachment to God. This brings the body and psychology alongside CSR and as Csordas (1995) notes of Emily Martin the body is becoming central as a focus in contemporary society. Soliman et al (2015) further suggest the potential of embodied cognition as a lens through which to understand religion while Purzycki (2013) extends this to include ecological components within an overarching framework.

“While contemporary cognitive accounts of religious concepts largely focus on how the mind constrains religious thought, a cognitive ecological view would examine how the environment both constrains and often appears to be an extension of cognitive processing... A cognitive ecological approach to religion therefore offers a more dynamic view of religious cognition than those offered by most contemporary approaches. As religious worldviews are embedded components of socioecological contexts and these contexts vary around the world, this warrants attention.” (Purzycki 2013: 100)

Conclusion

Throughout this essay I have drawn on academic research from the world of CSR and brought it alongside a very singular individual experience from almost four hundred years ago. Whilst western in orientation, my ambition was to show that how, within a single point of time, a well-documented occurrence can be brought under the scrutiny of modern understanding to explain and exemplify something of the workings of our cognitive processes and experience of the religious and the spiritual and, from this, to highlight its contribution to the field of religious studies, up to and including the present. Buddhist psychology (Bodhi 1993), almost two thousand five hundred years old in origin, may have shone a very different light on Fox’s experience and behaviour.

I have illustrated how CSR has become an expanding interdisciplinary field encompassing anthropology, evolutionary biology, neurology, neuroscience, psychiatry, psychology, anthropology and social science and now tentatively embraces theories from consciousness studies, ecology, and embodiment. While not perfect, it offers promise as field from within which religious studies and spiritual experiences can be explored.

George Fox may well have suffered mental health issues and been psychopathic in nature, a sick soul perhaps (James 1896; Kaag 2024), but he had a passion and commitment, belief and faith, and his continued soul searching, a part of the human condition for many, helped him and perhaps what a dark soul he managed to find the 'light' (Gillman 1997).

Perhaps one day Fox's contribution to the world's plethora of religious responses to our own thoughts, feelings, community of influence will further challenge our connectedness to the natural world and the impact we have on our environment. As Thomas Berry (2013), the self-professed 'Earth Scholar', eco-campaigning priest and cultural historian believed,

"We are not a collection of objects but a communion of subjects."

As a guiding principle for future studies, emphasising the need for an embodied and holistic approach to our experience of cognition, lived experience and religion, this may well be, as Fox even recognised, a guide for our stewardship and spiritual growth in harmony with each other, the planet, and whatever grand designs the cosmos may hold.

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