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# Thinking about Religion

Extending the Cognitive Science of Religion

Aaron C. T. Smith



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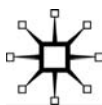
# Thinking about Religion

## Extending the Cognitive Science of Religion

Aaron C.T. Smith

*RMIT University, Australia*

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# Series Editors' Preface

The philosophy of religion has experienced a welcome re-vitalisation over the last 50 years or so and is now thriving. Our hope with the *Palgrave Frontiers in Philosophy of Religion* series is to contribute to the continued vitality of the philosophy of religion by producing works that truly break new ground in the field.

Accordingly, each book in this series advances some debate in the philosophy of religion by offering a novel argument to establish a strikingly original thesis or approaching an ongoing dispute from a radically new point of view. Each book accomplishes this by utilising recent developments in empirical sciences or cutting-edge research in foundational areas of philosophy, or by adopting historically neglected approaches.

We expect the series to enrich debates within the philosophy of religion both by expanding the range of positions and arguments on offer and establishing important links between the philosophy of religion and other fields, including not only other areas of philosophy but the empirical sciences as well.

Our ultimate aim, then, is to produce a series of exciting books that explore and expand the frontiers of the philosophy of religion and connect it with other areas of inquiry. We are grateful to Palgrave Macmillan for taking on this project as well as to the authors of the books in the series.

*Yujin Nagasawa*  
*Erik J. Wielenberg*

# 1

## *In the Beginning: Reconsidering the Cognitive Science of Religion*

### **Introduction**

In this book I argue that religion exploits the brain's hardwired imperative to wield beliefs for personal and social advantage. The mind needs beliefs, and religion lingers like a catchy tune.

More controversially, I position religious belief as a kind of 'placebo effect' – a beneficial psychological outcome arising from faith in the potency of chosen supernatural agents. By this I do not mean to infer a judgement about any metaphysical reality. Rather, my use of the term 'placebo' emphasises the centrality of belief itself rather than any truth-value. Religion imparts a real and powerful psychological effect, but does so without any physical evidence for its veracity. Fact follows faith for the religious believer.

Part of my argument presupposes that religion arose as a cultural phenomenon and not as a direct, biological adaptation. At the same time, biological adaptations in response to selection pressures remain instrumental to religion's success in particular, and to the way our minds covet beliefs in general. From this perspective, religious belief is one – but probably the most persistent – of innumerable belief sets, all supported by a mind that hates a vacuum. We need beliefs to survive, and religion has proven resilient because it leverages the mind's natural cognitive capacities for cooperation, social solidarity, and danger sensitivity.

Religion mobilises the mind's indigenous demand for belief systems in order to provide structured decisions without getting lost within an impossibly complex suite of alternatives. As a result, religion undeniably delivers personal and social benefits. In short, religion exploits the genetic features we inherit while reproducing through cultural forces. Religion therefore comprises an incidental cultural manifestation

stemming from the brain's innate proclivities to attribute intentionality to the mysterious, to construct beliefs as life heuristics to guide us through life's incomprehensible labyrinth, and to seek productive social and personal outcomes that enhance survival, procreation, belonging and meaning.

Religion persists not because the mind is primed for faith, but because it seeks to grasp and fiercely defend beliefs that make sense personally and socially, despite often defying objective reason. Belief is the currency of thought, and religious belief offers a powerful return on investment. Religious activity concentrates the mind's capacity to hold ideas that effectively galvanise groups and cultivate belonging. Believing when it is advantageous to do so comes naturally because it yields a personal placebo effect while also generating social opportunities.

*'Thinking about Religion'* presents a case for an inter-disciplinary science of religion extending the cognitive science of religion (CSR) programme. In developing the case, I propose that religion operates as a kind of psychological and social placebo effect. Religious belief combines thought, feeling and experience in a way that optimally leverages the natural tendency of the mind to latch on to socially and personally useful concepts. This effect delivers tangible benefits because religious concepts and practices feed the mind's natural drive to cling to strong beliefs. At the same time, beliefs are reinforced by favourable emotional responses. *'Thinking about Religion'* explains how these elements work together to make religious belief such a powerful placebo effect.

In a colloquial sense, I use the terms 'thinking' and 'cognition' interchangeably. Technically speaking, cognition and cognitive science incorporate a far greater expanse of literature and commentary than I could possibly summarise here. But from a more discursive perspective, the term 'cognitive' is used in this book in reference to how minds create representations or symbols of information, and then process them through perception and thought. I concede up front that this rather unsophisticated definition fails to accommodate the immense ensemble of nuances that exist within the multi-disciplinary field of cognitive science. On the other hand, I am trying not to get caught up in debates tangential to my purposes.

Cognitive scientists conclude that the belief in supernatural agents arrives through a set of cognitive adaptations that accompanied the selection process to solve other adaptive problems. In my opinion, religious beliefs reflect a by-product of sophisticated pattern-matching brain activity that erroneously assigns higher agency to patterns in the

white noise of life. In this book I argue that the patterns do not have to be religious in nature. I also aim to show how the most promising multi-disciplinary research programme around religious cognition – the cognitive science of religion – falls short of an integrated science of religious cognition because it fails to make deep connections between levels of evidence. That is, it struggles to reconcile the evidence generated by the major disciplines that address religious thought, such as biology, psychology, neuroscience, anthropology, and sociology.

Taking a more expansive view of the science of religious cognition encourages connections between analytical or disciplinary levels. Venturing beyond the CSR, I try to generate explanations for how and why religious belief persist that accommodate the evidence from cognitive psychology, biology, and neuroscience, as well as the long-standing research traditions in anthropology and ritual study. Given that my focus lies with religious cognition, like McCauley (2011, p. 148), I am interested in religion's recurrent features, but acknowledge that religion's features are not exclusively cognitive and nor are all of its cognitive features recurrent.

For example, religious practice relies upon physical rituals that simultaneously signal belief to others while stimulating memorable personal emotional responses. In this way religious practice can be intensely personal and transformational. Rituals also connect doctrine with experience by projecting religious interpretations upon uplifting emotional responses. As a result, religious practice satisfies psychological as well as social needs. Through rituals, action precedes belief, which helps practitioners to isolate unverifiable beliefs from normal rational analysis before they can be rejected. Such 'cognitive firewalls' safeguard doctrinal content, allowing key concepts to be rehearsed until they become ingrained. Counterintuitive and unverifiable beliefs even enhance meaning-making because they demand a committed effort in the form of reflective thought understood through religious doctrine.

In establishing a framework highlighting inter-connections between levels of analysis, I offer an explanation for the presence and on-going success of religious beliefs. In my version, religion concentrates the mind's various natural capacities to hold intractable beliefs. People use faith as a shortcut to help them navigate the complexities of decision-making, at the same time maximising satisfaction, comfort, belonging, and certainty. Religious belief is a powerful medicine even if the treatment relies on faith rather than fact: a placebo effect.

Cultural explanations for religion focus on practices and behaviours, while cognitive and evolutionary explanations rely on the assumption that faith comes naturally. At the same time, the neuroscientific evidence suggests that religious thought engages the same brain structures as any strong beliefs, distributed through both emotional and rational centres. It also shows how 'mystical' religious experiences can add gravity to entrenched doctrinal concepts. In this book I try to bring these diverse explanations more closely together to explain how even unverified beliefs can become embedded in the mind to deliver meaning and belonging.

I begin with an interest in a collection of scholarship loosely labelled as the Cognitive Science of Religion, which I propose constitutes an emerging explanatory framework for theoretical and empirical work. I map the features of the CSR and assess the strength of its claims to offer a programme for understanding religious cognition. My conclusion dilutes the CSR as I suggest that it overstates the mind's susceptibility to religious content and sidesteps other culturally prolific activities that also engage emotion, memory, belonging and belief. While I acknowledge some convergence pressures upon cultural activities, I argue that these pressures lead towards more generic tendencies such as the ability to hold belief sets, rather than the predisposition to hold religious beliefs. While I do recognise the evidence suggesting that religious content will be attractive to human minds, it is neither inevitable nor possible without the structure of cultural reinforcement. Religion is not therefore a unique domain, but operates within the more general domain of social agency. I also note that the mind is adept at learning; we can change our minds, discard ideas we acquired in the past, and choose to become or remain an atheist. However, before I venture further into the CSR and the areas in which it can be supplemented, it would be instructive to comment on what I mean by religion and religious cognition.

### **Establishing the boundaries**

A common starting point in analysing religion engages Durkheim (1961[1915]), who claimed that religion controls social action by organising people into social groupings. To Durkheim, religion manipulates a society's composition. At the same time, religion offers a symbolic expression and reflection of society through its powerful capacity to converge and enforce social norms. However, according to Durkheim, psychological explanations for religion fail to account for social

behaviour. Conversely, cognitive scientists do not like Durkheim's social theory because they believe that social facts ultimately need psychological explanations (Pyysiäinen 2003a, pp. 55–75).

Each disciplinary tradition emphasises a different interpretation and definition of religion. Where Durkheim focused on social functionalism, more recent sociological explanations favour social construction (Berger 1990), where individuals can manufacture their own meanings with or without the imposition of a religious doctrine. For anthropologists, an uncontroversial starting point would classify religion as a sub-unit of culture. To them, the term culture refers to the collection of fundamental values and attitudes common to members of a social group, and which consequently set its behavioural standards (Geertz 1973, 2000). In this respect, religion and cultural context must be inextricably interconnected. Wilson (1976) observed: 'Religious belief is one of the universals of human behaviour, taking recognizable form in every society from hunter gatherer bands to socialist republics' (p. 176).

Geertz (1973, p. 89) famously defined religion with reference to five characteristics: (1) A system of symbols which (2) establish powerful, pervasive and long-lasting moods and motivations through (3) the formulation of conceptions about a general order of existence that (4) clothe these conceptions with such an aura of factuality whereupon (5) the moods and motivations seem uniquely realistic. More recently, but with a similar outlook, Hinde (2005) offered a functional description of religion comprising six components: structural beliefs which refer to events or ideas that exist outside time, such as the concept of the Trinity; narratives that build upon the structural beliefs, organising them into contexts; rituals; moral codes; religious experience; and relations between participants. Every one of these components need not be present or equally represented.

Another line of thought more consistent with the cognitive approach has continued most recently through Bloom (2005). His intentionally minimalist definition describes religion as the belief in spiritual beings. Variations in kinds of supernatural agents seem common enough, but the type of knowledge attributed to them holds relatively consistent (Purzycki and Sosis 2011, p. 89). Cognitive scientist Atran (2002a, p. 4) provided a more concise definition: religion is a costly and difficult to fabricate commitment to a counterfactual world of supernatural agents who provide the impetus for mastery of individuals' existential anxieties. To Atran, religious beliefs engage a minimal violation of conventional and sense-driven notions of the world. Religion enables individuals to

imagine ‘minimally impossible worlds’, which relieve fears about death (Norenzayan and Atran 2002).

Beyond the traditional socio-cultural interpretations originating from the anthropological tradition, another more recent explanation for religion’s prevalence suggests that an evolved set of cognitive mechanisms supports the acquisition, transmission, and stability of religious concepts (Lawson 2000, p. 340). In crude terms, religion is ‘natural’ because its concepts fall upon fertile mental soil. To paraphrase McCauley (2011, p. 159), just as we find some foods good to eat, our minds find religious concepts good to think. The research activity developing around cognitive explanations of religion has increased significantly as observed by cognitive science onlookers (Deacon 1997, p. 109; Pinker 1997, pp. 525–565), incorporating explanations for religious doctrine (Atran 2002a), transmission (Boyer 2005), rituals (McCauley and Whitehouse 2005; Whitehouse 2005), and evolution (Slone 2005).

As I noted, my point of departure lies with a collection of work on religious cognition that I label the ‘Standard Model’, a term appropriated from Boyer (2003, p. 3). Although Boyer’s term implies a level of acceptance similar to the standard model of physics, the religious cognition version remains contentious. On my interpretation, the Standard Model – or the CSR – constitutes a set of propositions about religious cognition used by cognitive scientists as an explanatory framework. In this book, I pursue three objectives originating from the CSR. First, I identify its features. Second, I examine its strength as an explanatory framework for religious cognition. Third, I introduce key evidence from other scientific disciplines in an attempt to formulate a more comprehensive framework for the analysis of religious cognition in the form of a revised and extended model of the CSR. My approach involves building layers and connections before revealing the model, but it can be found in diagrammatic form in Chapter 10.

Religious cognition means thinking about religious content. Cognitive scientists focus on the mental correlates of religious content; the symbolic, psychological ‘representations’ about domains. In this context, a domain is a distinct kind or type of content (Hirschfeld and Gelman 1994, p. 21). By studying representations about domains, cognitive scientists map the nature of thoughts about religious content. According to cognitive explanations, religious content accompanies ordinary thought processes as natural by-products (Atran 2002a, ch. 1; Boyer 2001, p. 50; Dawkins 1982; Norenzayan and Atran 2002; Pyysiäinen 2003a, pp. 5–8; Sperber 1996).

Minds possess a suite of cognitive capacities attuned through natural selection to solve 'domain-specific' problems. For each major domain of problems, a specific cognitive mechanism offers an efficient, modularised and intuitive solution, both facilitating and constraining religious activity (Boyer 2005). Sperber and Hirschfeld (2004, p. 41) make the important distinction between the 'proper' domain and the 'actual' domain of a cognitive mechanism (or 'module' or 'device'). The proper domain constitutes the information the module was biologically determined to process, like faces for a face-recognition module. An actual domain includes all the environmental inputs that satisfy the modules triggering conditions, including the innumerable objects and images that could be interpreted as a face. Sperber and Hirschfeld's (2004, pp. 41–42) distinction allows them to explain false positives where a mismatch occurs between the two domains. In addition, the specification of two domains helps the authors theorise about why domain creep occurs and why modules seem to be related to cultural domains (Sperber and Hirschfeld 2004, p. 45). For example, certain representations become more widely distributed than others, perhaps a result of actual domains influencing the character of proper domains.

Studies of religious cognition emphasise the operation of domain-specific mechanisms also known as devices or modules (Pyysiäinen 2003a, p. 209). For efficiency, cognitive devices mainly operate without conscious awareness, providing intuitive assumptions and inferences about the world and its contents. Information is processed, categorised, and stored in unconscious templates delivering 'minitheories' about how best to navigate the world. Cognitive devices also 'prime' human experience (Van Slyke 2005, p. 5), and according to the CSR, create a propensity for certain patterns of religious thought.

A critical mass of religious cognition research and analysis has led to an emerging explanatory framework. Although the framework does not claim any official status, its core elements may be considered a loose consensus amongst cognitive scientists of religion. However, the framework faces internal challenges in cognitive science, and external challenges from associated disciplines. My interest stems from this combination of nascence and vulnerability. By way of introduction, below I provide seven propositions consistent with Boyer (2005, pp. 4–6) and other prominent CSR advocates that summarise the CSR:

1. Domain-specific cognitive devices create religious representations (Atran 2002a, p. 266) as a by-product. As a result, religious cognition

remains 'parasitic' upon ordinary cognitive functions; religious cognition is not a unique or distinct category independent from other forms of cognition.

2. Domain-specific cognitive devices generate intuitive inferences, but religious representations violate these unconsciously generated assumptions. Religious concepts are therefore said to be 'counterintuitive', meaning that they defy ordinary expectations about the world and its contents. Religious concepts enjoy a transmission advantage as a result because counterintuitive concepts tend to be memorable (Boyer 2001, ch. 2, 2003, pp. 18–23; Pyysiäinen 2003a, p. 53).
3. The mind intuitively attributes agency and goal-driven behaviour to events and situations (Leslie 1994, 1996). Religious practitioners naturally infer the presence and interests of supernatural agents, to whom responsibility for the unexplained may be accredited.
4. Cognitive devices encourage assumptions about the intentions of supernatural agents (Boyer 2001, pp. 45–46; Dennett 1987, 2006). Religious practitioners conceive the intentions and judgements of supernatural agents and interpret events in accordance with doctrine.
5. The mind's ability to identify and interpret emotions leads religious practitioners to ascribe emotional judgements to supernatural agents. Emotions also encourage religious behaviour by reinforcing doctrinal conditioning, which in turn leads to repetitive performance. In addition, emotion-detection alleviates or amplifies existential anxiety by connecting the judgements of supernatural agents with rewards or punishments in the afterlife (Atran 2002a; Boyer 2003; Livingston 2005, pp. 75–78; Pyysiäinen 2003a, 2006; Thagard 2005b; Whitehouse 2004).
6. Cognitive devices facilitate social exchange through ritual performance (Whitehouse 2002). Practitioners demonstrate their preparedness to endure costly sacrifices in order to prove worthy of both supernatural agents and social networks.
7. Innate moral reasoning and intuition provides a strong platform for conceiving the wishes of supernatural agents (Bering and Johnson 2005, p. 136). The wishes of supernatural agents correspond to intuitive moral assumptions.

As to my first concern regarding empirical support for the CSR, I reveal a complex and uneven landscape. I review the CSR's claims by applying a series of seven analytical criteria (see Thagard 2005a), each comprising a chapter, summarised next:

1. The criterion *representative power* refers to the ability of the CSR to account for a variety of cognitive representations. It helps to explain the presence of religious mental representations.
2. The criterion *computational power* specifies how well the CSR describes mental computations. It helps to explain the operation of cognitive devices and the way they compute or process religious representations.
3. The criterion *psychological plausibility* reflects how likely it is that the processes identified by the CSR are actually undertaken. It helps to explain the religious behaviour that cognitive devices encourage.
4. The criterion *neurological plausibility* refers to the CSR's ability to describe the mental processes physically occurring in the brain. It helps to explain the relationship between cognitive devices, brain operations and religious thought and behaviour.
5. The criterion *practical applicability* specifies the CSR's capacity to explain real world behaviour and experience. It helps to explain religious extremism and atheism, as well as prosaic religious experience.
6. The criterion *evolutionary plausibility* describes the extent to which the CSR can be aligned with selection pressures and the biological theory of evolution. It helps to explain the relationship between cognitive devices, evolutionary selection pressures, and religious thought and behaviour.
7. The criterion *integrative power* describes the capacity of the CSR to assimilate evidence from different levels of explanation, where a level represents an analytical stratum. It helps to explain the relationships between theories generated by the CSR that operate in different disciplines.

The CSR claims that the mind is adept at acquiring, maintaining and transmitting religious concepts and beliefs. Religious beliefs are appealing to human minds. However, I argue that it builds on some contentious assumptions. My examination tackles the fundamental assumptions of cognitive science, including the role of evolution and natural selection, the process of adaptation, the presence of domain specificity, cognitive canalisation, and structure-function relations in the brain. While some evidence supports the proposition that the mind is attracted to religious content, I claim that the CSR overstates the 'naturalness' of religious belief. In addition, I express misgivings about some assumptions assigned to the cognitive mechanisms underpinning the CSR's theoretical premises.

The emerging CSR research programme I am examining, and seeking to bolster, explains the persistence of religious practice. Its first premise holds that the historical and geographical patterns of religious practice reflect shared solutions to common survival and social problems in the form of an evolutionary homology. Although religion is not a direct or 'ultimate' adaptation, its practice emanates from a common set of cognitive mechanisms. On my assessment, however, the case is overstated. It overlooks cultural diffusion as an explanation for similar structures in religious practice (Appiah 2009, p. 200) while overzealously conflating the multiplicity of religious manifestations to a handful of representative features. Somewhere between these two positions lies the serious and unresolved question as to why some patterns and structures diffuse and endure where others do not. I suggest that the CSR highlights some powerful explanations for cultural canalisation, but goes too far in claiming religion as a 'natural' phenomenon or 'instinct'. Instead, I think the available evidence demonstrates that human cognition drives social engagement and identification where religion reveals a prototypical but not unique expression. In my view, the evidence decisively presents religion as a socially advantageous practice. But, does religion possess something distinctive and more powerful than other social formations that encourage solidarity and group identity such as nationality, ethnicity or kin connections?

To summarise my conclusions and the fundamentals of my revised model, I think that human minds are susceptible to religious content, but no more so than other culturally prolific activities that also engage emotion, memory, belonging and belief. I present evidence suggesting a relationship between culturally widespread activities and cognitive capacities. While I acknowledge some convergence pressures upon cultural activities, they lead towards more generic tendencies such as the ability to hold belief sets, rather than a predisposition to hold religious beliefs. Religious cognition is not a unique domain, but a general domain incorporating social relationships between agents. Although some evidence suggests that religious content will be attractive to human minds, it is not inevitable. In fact, religion is not sustained by natural cognitive mechanisms alone; the structure of cultural reinforcement remains essential. I am sympathetic to Armin Geertz's (2010, pp. 304–305) argument that we need a theory of religion capable of a more expansive view of cognition. That is, one accommodating brain, body, and culture, as well as one extended beyond the borders of individual minds. I therefore suggest that the CSR overstates the case for the

natural acquisition of religious beliefs while underestimating the role of cultural context. In the following section, I provide some background specifying the cognitive science approach to cognitive analysis.

## **Cognitive science: an approach to cognition**

Cognitive theorists sometimes liken the transmission of cultural knowledge to the virulence of a contagious disease. Infections spread not just because of exposure, but also because of the susceptibility of those exposed (Dawkins 1982; Norenzayan and Atran 2002; Sperber 1996). The successful transmission of concepts occurs through both cultural exposure and cognitive receptivity. Taking a cognitive perspective of religious concepts brings with it the assumption that physical things, events, and people are not independent of the minds that perceive them (Sperber 1996). Cognitive scientists of religion study the way people maintain and transmit mental representations about religious content, starting from the first premise that religious representations gain easier traction in the mind because they align with 'natural' (McCauley 2011) processes.

According to Thagard (2005a), the central hypothesis of cognitive science may be described as the Computational-Representational Understanding of Mind: 'Thinking can best be understood in terms of representational structures of the mind and computational procedures that operate on those structures' (p. 10). Mental representations are useful to study for at least two reasons. First, they symbolise the mental correlates of a domain of thought. According to Hirschfeld and Gelman (1994, p. 21), 'A domain is a body of knowledge that identifies and interprets a class of phenomena assumed to share certain properties and to be of a distinct and general type.' Second, representations contain implicit content about the domain of interest. Understanding this content provides an insight into the way individuals perceive their worlds. Sometimes groups of representations and their corresponding domains are called schemas, which provide intuitive shortcuts, or heuristics, regarding the way things work. For example, a religious schema might include the prosaic, such as how to light incense, as well as the subtle, like how to behave in church during mass.

Computationalism asserts that mental states occur when the mind performs computations on symbolic mental representations. Crudely speaking, the mind works like a digital computer, operating according to rules directing how it deals with mental representations. Cognitive science assumes a distinction between the content of cognition and the

physical structure of the brain that houses and executes cognition (see Albright and Neville 1999, p. 1ii). According to Repovš (2001, p. 40), the cognitive paradigm stimulated two significant changes in the study of the mind and brain. First, it offered a platform for the study of the mind and the brain at a time when the behavioural approach had denied their relevance. Second, it established decompositional analysis as the chief research and interpretive strategy, with computational processing as the central platform. In short, using a computational approach encourages the reduction of mental processes to constituent elements. According to Friedenbergh and Silverman (2006, ch. 1, 4), the computational approach maintains that the brain possesses specific information-processing components and functions. Successfully analysing religious cognition means establishing how religious representations get formed and processed; issues considered in Chapters 2 and 3 respectively.

Cognitive scientists sometimes describe cognition in architectural terms, where the processes and rules governing thought receive structure (Jordan and Russell 1999, p. 1xxvi). The architectural metaphor leads to debates about the specificity of cognitive function. The key question is whether cognition functions through a single but general mechanism, or through multiple, specific mechanisms. As a general rule, the multiple, specific mechanisms perspective dominates cognitive science, although the magnitude and nature of the mechanisms remain fiercely debated. An important example of contention can be found in the dispute between so-called computationalists and connectionists.

The computational view emphasises mental representations and their rule-based, algorithmic manipulation. In contrast, the connectionist view sees the mind as a complex organisation of interacting subsystems, each performing a specific cognitive function, the decomposition of which represents a form of psychological explanation (Jordan and Russell 1999, p. 1xxvii; Ramsey 1999). Connectionism focuses on processing units in a neural network. It assumes that cognitive operations rely on a distributed form of processing that does not need symbols or rules. Connectionism gets its inspiration from neuroscience rather than computational models. While connectionists believe that brains do perform a kind of information processing, they discard comparisons to computer models due to a lack of structural and dynamic complexity (Koch and Laurent 1999). Taken to the strongest connectionist interpretation, neuroscience suggests the potential for 'eliminative materialism', where psychological experiences are reduced to precise brain operations for each mental state (Churchland 1981).

As with all scientific disciplines, the antecedent traditions in cognitive science have delivered a philosophical legacy, especially since it operates at the intersection of several disciplines (Matlin 2005, ch. 1). In particular, cognitive science assumes a computational-representational view of the mind where domain-specific cognitive mechanisms generate intuitive inferences about the world and its contents. Cognitive science aims to determine the composition and functionality of these mechanisms, as can be seen in the work associated with religious cognition.

Another key assumption for cognitive scientists is the view that the mind possesses a suite of domain-specific devices – or mechanisms or modules – that deliver intuitive inferences about domains. A domain-specific cognitive device may be seen as a specialised, encapsulated mental processor produced through evolutionary processes. Although cognitive science champions a ‘modular’ presentation of the mind, little consensus has been reached as to its operation or importance in cognition. Nevertheless, as a rule, the cognitive science of religion advances a strong version of modularity.

An intuitive inference is an automatic assumption that ‘embodies a person’s ontological commitments and provides modes of explanation for the phenomena in its domain’ (Pyysiäinen 2003a, p. 209). Because intuitive inferences operate automatically without conscious awareness, they are also an efficient form of decision-making. Information is processed, categorised, and stored in mental templates that provide “‘minitheories” about navigating our environment and prime humans to experience certain types of objects in the world in particular ways’ (Van Slyke 2005, p. 5). I explore modularity in detail in Chapter 3, which focuses on the computational power of the CSR. In Chapter 3, I assert that modularity remains an important dimension of the CSR, but not as important as broader work in cognitive science would suggest. Next, I outline the foundations of the cognitive science of religion.

## **The cognitive science of religion**

Despite the increasing popularity for cognitive explanations of religion over the last decade and a half (Deacon 1997, p. 109; Pinker 1997, pp. 525–565), the role cognition plays in religious belief remains fiercely debated. Lawson (2000) argued that a cognitive theory of religion must demonstrate ‘...that despite the obvious variability of religion across

cultures and throughout history there lay a similar specifiable commonality' (p. 340). He observed that the CSR focuses on how human minds represent, acquire, and act on religious ideas. Resolving these three problems constitutes the central work on religious cognition.

Understanding how individuals think about religion seems undeniably important given religion's prevalence. One survey, for example, estimated that more than 80 per cent of the world's population holds some form of religious conviction (Barrett et al. 2001, p. 550). At the same time, according to Hay (1990, ch. 5) and Spilka, Brown, and Cassidy (1992), approximately one-fourth to one-third of American and British citizens report having undergone a religious experience, while around 3 per cent claim to have experienced an intense mystical episode (Beit-Hallahmi and Argyle 1997, ch. 9). Religious belief might be widespread, but the composition of beliefs varies, even within the same denomination. In fact, Barrett (1999) demonstrated the potential for differences between a person's religious beliefs and the official line taken by the religious group to which they belong. Religious belief seems to be common, but the content of religious belief is parochial, perhaps even individual (Slone 2004, ch. 1).

Anthropological research reinforces the importance of contextual and social variables on the formation of beliefs, as exemplified by differences in language, music, leisure, and religious practice between cultures. Cognitive scientists, however, consider the relationships between environmental factors and the host potential of the mind. A cognitive explanation regards culture as both a material phenomenon and a cognitive representation of material phenomena (Sperber 1996). The term cognitive here refers to mental information processing including elements such as attention, perception, learning, memory, and decision-making (Eysenck and Keane 2005, ch. 1).

Cognitive science takes a multi-disciplinary approach, drawing on several diverse fields including biology, psychology, neuroscience, computer science, philosophy, anthropology, linguistics, and sociology (Bechtel and Graham 1998; Matlin 2005, pp. 1–47; Thagard 2005a, p. 10). According to Stainton's (2006: preface) strict interpretation, cognitive science possesses four branches: the behavioural and brain sciences such as psycholinguistics, neuroscience, and cognitive neuroscience; the social sciences concerned with the mind, including anthropology and sociolinguistics; the formal disciplines like logic, computer science, and artificial intelligence; and parts of philosophy such as philosophy of mind and language. We should keep in mind Sobel's (2001, ch. 1) reserved

observation that the ideas, research and knowledge regarding the mind exceed any individual's familiarity. Cognitive science seeks to coordinate this vast body of knowledge by providing a converging point of interest: cognition. Cognitive approaches attempt to show that ordinary, natural cognitive mechanisms account for the presence of religious concepts. As Barrett (2009, p. 76) put it, 'Evolution has endowed humans with particular mental faculties and social arrangements that prop up religious illusions.'

For many scholars including cognitive scientists, religion demands a belief in supernatural agents (Rappaport 1999; Sosis and Alcorta 2003), even though they might take innumerable forms (Dawkins 2006, p. 18). A more expansive view I prefer by Sosis and Alcorta (2003, p. 265) claimed that the following four elements occur commonly in literature from anthropology and sociology, encompassing cognitive, behavioural, affective, and developmental aspects of religious systems:

1. Belief in supernatural agents and counterintuitive concepts;
2. Communal participation in costly ritual;
3. Separation of the sacred and the profane;
4. Importance of adolescence as the life history phase most appropriate for the transmission of religious beliefs and values.

With a nod to the notorious difficulty with defining religion, cognitive scientist Pyysiäinen (2003a, ch. 1) suggested that the common conception includes: ideas of non-observable, extra-natural agencies; the belief in a non-physical component of persons surviving death; and the notion of special categories of persons receiving some kind of divine inspiration. Similarly, Atran and Norenzayan (2004, p. 713) defined religion according to the following four characteristics:

1. Widespread counterfactual and counterintuitive beliefs in supernatural agents (gods, ghosts, goblins, and so on);
2. Hard-to-fake public expressions of costly material commitments to supernatural agents, that is, offering and sacrifice (offerings of goods, property, time, life);
3. Mastering by supernatural agents of people's existential anxieties (death, deception, disease, catastrophe, pain, loneliness, injustice, want, loss);
4. Ritualised, rhythmic sensory coordination of (1), (2), and (3), that is, communion (congregation, intimate fellowship, and so on).

As can be inferred from the previous lists, most definitions of religion treat the belief in a supernatural agent as the central pillar, although some, like Dennett (2006), attempt to marry social and cognitive features. Dennett proposed that religions are 'social systems whose participants avow belief in a supernatural agent or agents whose approval is to be sought' (p. 9). For Dennett, the key variable is a belief in a god or gods, as practised within a social group. He also acknowledged that although a supernatural agent may be omnipotent, they remain anthropomorphised, an observation fundamental to cognitive explanations. Sosis and Alcorta (2003) observed, however, that the belief in a supernatural agent does not fully differentiate religion from commonplace perceptual experience or from other supernatural beliefs that do not involve ritualistic and dogmatic practices. This is an issue I extend further in the next section.

For Pyysiäinen (2003a, ch. 1), the cognitive analysis of religion seeks to explain how counterintuitive concepts become objects of serious belief. Along the same lines, Atran (2002b, pp. 13, 264) offered a 'rough and ready' characterisation of religion emphasising a community's costly and hard-to-fake commitment to a counterintuitive world of supernatural causes and being. Atran's coarse description seems to be a suitable beginning, although it does not accommodate religious experiences. In this book I take an inclusive view of religion where it represents the combination of doctrinal concepts and a commitment to a spiritual world of the supernatural (Krippner 2005, p. 81). This is inclusive because it covers the three major Abrahamic traditions – Christianity, Islam, and Judaism – as well as Buddhism, Hinduism, and any spiritual or religious beliefs reliant on the presence of a supernatural world.

Before I venture further into the cognitive approach, a few introductory remarks about more subtle differences of interpretation between scientific models of religion are warranted. At various points, at least three explanatory accounts of religion intersect: a cognitive account; an evolutionary account; and a co-evolutionary account. While much of these three accounts overlap – including commentators – they each take a different position on the key point of religion and adaptation. In order to clarify the differences, I need to provide some brief background theory.

Two modes of evolutionary explanation warrant elaboration. Mayr (1961, 1993) observed in two landmark papers that first, a proximate explanation is concerned with functional causes, including the elements and processes that comprise human social behaviour. Proximate