Paper Title: Religion and Cognitive Science: Cognitive Constraints and Top-down Causation

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Abstract:

The field of cognitive science has virtually exploded in the last two decades, as scientists study the mechanisms of the brain and specific areas of cognition such as language, concept formation, and emotion. Due to the empirical success of cognitive science, many philosophers, scientists, and anthropologists have begun to apply the insights of cognitive science to how religious concepts and experiences are developed and transmitted to others. In fact, many scientists are now arguing that the development and transmission of religious beliefs is a natural process dependent upon implicit cognitive systems which are the product of evolution. Thus, understanding religion through research in cognitive science allows for a detailed empirical investigation of religious phenomena.

The goal of this paper is to provide a critique of the reductionistic aspects of current studies in the cognitive science of religion and to argue in favor of the addition of 'top-down' causation to the 'bottom-up' accounts provided by cognitive science. The cognitive science of religion, though helpful in its description of cognitive and neurological systems involved in religion, gives these implicit systems priority over the explicit cognitive systems which also have a role to play in religious cognition. This framework assumes causal reductionism in that the 'cause' of religious concepts and experiences is the constituent parts of cognition (i.e. universal cognitive architecture and evolutionary selection). Though understanding the role of cognitive systems in religion is an important goal, it is not necessary to reduce religion to cognitive terms.

What is missing in these accounts is the notion of 'downward' or 'top-down' causation, where other explicit cognitive systems also can effect religious beliefs in a particular way. Higher level cognitive processes are shown to possess certain causal powers in that they select from the lower-level possible states. From this point of view, the mind is a contextualized brain state involving a person in action feedback loops with the culture and environment. Religious beliefs can have a top-down causative effect on religious behavior and thought. The development of religious beliefs is both constrained by certain aspects of our evolved cognitive systems, but is also shaped by the religious traditions in which those particular beliefs are embodied. Religion as a social process is constrained by certain cognitive functions, but it also helps to select and instantiate particular types of cognitive religious thoughts. The development of religious beliefs is not an exclusively cultural or cognitive process, but involves both systems working together to form religious beliefs. The addition of top-down causal factors to the study of religion will allow for a more complete and accurate view of religion, noting all the important factors, including the possibility of the involvement of God.

Biography:

My name is James Van Slyke and I am currently a doctoral student at Fuller Theological Seminary working on an interdisciplinary degree in theology and psychology. The primary focus of my studies has been the relationship between theology and science, particularly in the areas of cognitive science, philosophy of mind, and Christian theology. I have been working with Nancey Murphy (professor of Christian philosophy) and Warren Brown (professor of psychology) in these different areas. My dissertation looks at theories in the cognitive science of religion and their focus on cognitive modules which unconsciously influence how religious beliefs are developed and transmitted. Although understanding cognition is helpful in the study of religion, I use the concepts of emergence and top-down causation to show how a religious belief can consciously direct behavior. I am an adjunct professor at Azusa Pacific University and teach classes in several areas including: cognition, physiological psychology, and abnormal psychology. I also lead a research group with students at Azusa looking at how cognitive theories affect religious beliefs. We will be attempting to begin a new research project in the fall. I am also an adjunct instructor at Fuller Theological Seminary and will be teaching a class in Christian Apologetics in the spring.

Paper Text:

Introduction

Ilkka Pyysiainen begins the preface to his book *How Religion Works* with an interesting statement:

> I want to make a strong claim that the mechanisms underlying religious thought and behavior are something that can be naturally explained, just like any other cultural and cognitive phenomena. I am also perfectly aware that many scholars studying religion want to argue that such explanations always fail because they cannot reach the essence of religion, which is ultimately a mystery.[1]

By "naturally explained" Pyysiainen is referring to cognitive mechanisms or modules which underlie all human cognition. Pyysiainen is arguing in favor of the use of cognitive theories to understand the development and transmission of religious beliefs. Religion has usually been associated with the mysterious, divine, and emotive, all beyond the study of science. The cognitive science of religion seeks to use scientific models of human cognition to better understand religion. Pascal Boyer in his book *Religion Explained* puts the discussion in these terms:

> …the intractable mystery that was religion is now just another set of difficult but manageable problems. The explanation for religious beliefs and behaviors is to be found in the way all human minds work…properties of minds that are found in all members of our species with normal brains.[2]

The concern for most religious scholars is the possibility that a cognitive science of religion may become reductionistic. Kelly Bulkely in a recent review of these two books shows the concern over an openly reductive account of religion:

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[1] Ilkka Pyysiainen, *How Religion Works: Toward a New Cognitive Science of Religion* (Leiden: Brill, 2003), vii.

[2] Pascal Boyer, *Religion Explained: The Evolutionary Origins of Religious Thought* (New York: Basic Books, 2001), 2.

> Beliefs, doctrines, practices, rituals, mystical experiences, moral systems, communal structures – everything about religion can be explained, according to Boyer and Pyysiainen, by using the latest advances in evolutionary theory and cognitive science.[3]

Yet, it is interesting that Pyysiainen argues that not all aspects of religion will be explained in cognitive terms, he only wishes to show the *contributions* of cognitive science to the study of religion. Boyer seems to agree that any scientific explanation will miss some important point to particular groups of persons, but this should not be a reason to avoid scientific research in religion.[4]

Although there are aspects of the cognitive science of religion that are reductionistic, I will argue that current theories in the cognitive science of religion can provide a 'bottom-up' account of religion in that it can show the contributions of particular aspects of ordinary human cognition that are involved in religious cognition. A 'bottom-up' account refers mainly to explanation in terms of the unconscious, implicit cognitive systems of the human person. 'Top-down' causal factors refer to the role of explicit religious concepts in development of religious beliefs and behaviors. Religious traditions provide a particular language through which religion is understood, this provides a particular type of cognitive 'scaffolding' which helps to provide a context for thought and action in the world. This cognitive process is 'top-down' in that it draws from a larger conceptual pattern and may include several different cognitive subsystems (emotional, semantic, etc.), which provide a particular framework through which thoughts and behaviors are understood in a 'religious' way. Views of religion that focus on implicit cognitive systems tend to view conscious cognition and larger religious conceptual frameworks as either epiphenomenal or merely interpretations of the implicit systems. Instead the use of more explicit cognitive systems should be seen as an important cognitive factor that is not merely epiphenomenal or interpretive, but does real causative work and structures the way in which the world is viewed. Much of the discussion on implicit cognition is based on current work in evolutionary psychology. John Tooby and Leda Cosmides provide a "primer" on evolutionary psychology.

Evolutionary Psychology

Tooby and Cosmides argue that evolution has designed a specific and universal cognitive architecture. This architecture contains specific modules designed by the process of evolution to solve certain adaptive problems.[5] An adaptationist perspective presumes that the human brain has had specific adaptations similar to other human organs, yet these adaptations have been cognitive, in that they solved certain problems of hunter-gatherer societies and were passed on genetically. The human mind is like a Swiss army knife, with different tools used for different problems that arise in the

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[3] Kelly Bulkely, review of *How Religion Works: Towards a Cognitive Science of Religion* by Ilkka Pyysiainen and *Religion Explained: The Evolutionary Origins of Religious Thought* by Pascal Boyer, *Journal of the American Academy of Religion*, 71 (September 2003), 671.

[4] Pascal Boyer, *The Naturalness of Religious Ideas: A Cognitive Theory of Religion* (Berkeley: University of California Press, 1994).

[5] Leda Cosmides and John Tooby, *Evolutionary Psychology: A Primer*. Retrieved August 2004 from www.psych.ucsb.edu/research/cep/primer.html.

environment. Justin Barrett classifies these tools into three different functions: categorizers, describers, and facilitators.[6] Barrett suggests a specific list of possible tools:

Categorizers	***Describers***	***Facilitators***
Object Detection Device	Object Describers	Social Exchange
Agency Detection Device	Living-thing Describer	Regulator
Face Detector	Theory of Mind	Social Status Monitor
Animal Identifier		Intuitive Morality

This Swiss army knife is a computational device with each different module specifically calibrated to solve the problems of our ancient ancestors, particularly understanding about plants, classifying different animals as friend or foe, and interacting socially for mutual advantages. This is in contrast to the Standard Social Science Model which believes the mind to be a type of general-purpose learning machine or 'blank slate.' According to this model, from birth, humans are 'blank slates' and it is culture which enables persons to learn how to navigate their worlds. Evolutionary processes and brain physiology have little if anything to do with the ways in which intelligence functions in the human person. Tooby and Cosmides claim that rather than a blank slate, humans actually have a conceptually rich, universal cognitive architecture which was constructed by the cognitive adaptations necessary to thrive in the environments of our Pleistocene hunter-gatherer ancestors.[7] To understand these cognitive modules it is necessary to investigate cognition through a type of "reverse engineering."[8] We must understand the problems that faced early humans to understand how the brain evolved.

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Religious Cognition as Counter-Intuitive

Religious concepts as 'counter-intuitive' has become an important theoretical contribution to the cognitive science of religion and provides a conceptual framework that can be tested empirically. Each human mind contains specialized inference systems which interpret and conceptualize information in particular ways. Most of these systems operate below the level of human conscious awareness, which makes them much more salient and effective in directing religious cognition in particular ways. Religious concepts are not exactly like other concepts constructed by the human mind. They have a particular etiology developed through the inference systems of the human mind.

> To sum up, we can explain human sensitivity to particular kinds of supernatural concepts as a by-product of the way human minds operate in ordinary, non-religious contexts. Because our assumptions about fundamental categories like PERSON, ARTIFACT, ANIMAL, etc., are so entrenched, violations of these assumptions create salient and memorable concepts.[9]

Religious concepts are connected to intuitive ontologies based on the natural physical world; this allows persons to make inferences based on other physical phenomena that

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[6] Justin L. Barrett, *Why Would Anyone Believe in God?* (Walnut Creek: Alta Mira Press, 2004), 5.
[7] John Tooby and Leda Cosmides, "Mapping the Evolved Functional Organization of the Mind and Brain" in *The Cognitive Neurosciences*, ed. Michael Gazzaniga (Cambridge: The MIT Press, 1995), 1187.
[8] Steven Pinker, *How the Mind Works* (New York: Norton, 1997), 21.
[9] Pascal Boyer, "Why is Religion Natural?" *Skeptical Inquirer* 28: 2 (March 2004) Retrieved August 15, 2004, url: http://www.csicop.org/si/2004-03/religion.html.

have been observed and categorized. A concept is religious or supernatural according to its counterintuitive properties, properties that defy our natural human categories; yet only those properties that have enough connection to regular physical properties allow for inference.

To explain this further, let us first look at the development of templates and the important differences between a template and a concept. A template is a type of category; Boyer mentioned three examples in the preceding quotation: PERSON, ARTIFACT, and ANIMAL. A concept would be based on the *animal* template, like a "giraffe." The template provides a broader categorical understanding of a particular phenomenon in the environment. So the animal template might be arranged according to its name, where it lives, what it eats, how it reproduces, and its body design. Now, obviously, as relevant information and experience are gained through time, the concept of a giraffe will become much more sophisticated. What is important, according to Boyer, is that the templates allow us to make certain inferences about other animals and that particular animal.

Boyer provides a helpful illustration:

> A child is shown a new animal, say a walrus, and told the name of the species. What the child does – unconsciously of course – is add a new entry to her mental "encyclopedia," an entry marked "walrus" that probably includes a description of the shape…. We also know that the child spontaneously adds some information to that entry, whether we tell her or not. For instance, if she sees a walrus give birth to live cubs, she will conclude that this is the way all walruses have babies. You do not need to tell her that "all walruses reproduce that way."[10]

For Boyer, the important aspect of templates is the way in which they allow persons to develop concepts using only 'fragmentary' information, unconsciously, yet accurately. Templates tend to be more abstract, yet stable over time and do not vary much according to culture or level of expertise. Ultimately, templates are a type of mental recipe for producing new concepts which fall into that particular category.

The most important templates are those that provide stable ontological categories such as tool, person, and animal. Whenever something is added to the template, the human mind assumes a default inference, concluding that the general properties of TOOL must apply to the newly categorized item such as: manmade, shape fits function, and inanimate.[11] Thus, whenever a person learns about a new tool, there are certain expectations about what can be done with the tool, what it is made of, etc. These templates strongly constrain the types of possible mental events and thoughts developed in our imaginations. The templates provide "minitheories" about navigating our environment and prime humans to experience certain types of objects in the world in particular ways.

The common features of religious concepts are contained in the templates that actually produce natural concepts. Templates that are used to develop religious concepts have certain essential features.

> Religious representations are particular combinations of mental representations that satisfy two conditions. First, the religious concepts *violate* certain

[10] Boyer, *Religion Explained*, 42.
[11] Ibid., 59.

expectations from ontological categories. Second, they *preserve* other expectations.[12] (Use page 3 of cog templates article, Boyer)

So religious concepts use the same templates: PERSON, TOOL, ANIMAL, but add on a special feature that violates the general properties of the category. So for example:

Omniscient God = [PERSON] + special cognitive powers
Visiting ghosts = [PERSON] + no material body
Reincarnation = [PERSON] + no death + extra body available
Listening statue = [TOOL] + cognitive functions
Guardian River = [NATURAL OBJECT] + incest abhorrence[13]

Consider the example of a ghost. When persons listen to stories about a ghost there are certain properties that violate the concept of person: walking through walls, being a spirit, being dead, having special powers. Yet, there would also be certain properties that a person would unconsciously assume because this concept is part of the PERSON template. Imagine a ghost were to visit you while you were having dinner. After the initial shock, you would still probably assume several things.

> You assume that the ghost saw you were having dinner, so she now knows what you were eating. Also the ghost probably heard the sound of your spoon landing in the soup and can now remember that you dropped it. You assume that the ghost knows you are here, since she can see you. It would be unsettling but not too surprising if the ghost asked you whether you were enjoying your dinner…. In other words, you assume that ghost has a mind.[14]

So despite the fact that you had a completely 'unnatural' experience, much of the experience would still be processed relying on certain templates of the natural world.

The violation of ontological categories is actually what causes religious concepts to be memorable concepts. Statements which violate a certain aspect of an ontological category are more likely to be remembered than standard associations or outright oddities. This is also a cross-cultural phenomenon. Boyer and Charles Ramble conducted experiments in diverse cultures such as France, Gabon, and Nepal to test the hypothesis that concepts which violate certain aspects of cognitive templates are more memorable than other types of concepts.[15] They found that across cultures, concepts which violated certain natural phenomena were much more memorable, while familiar natural concepts were not retained for any significant amount of time.

Boyer makes several important contributions to the study of religion. First, religion is not based on a specialized neural circuitry, but uses the same circuits used in other contexts to process information. What makes religious cognitions special are their counter-intuitive properties, the way religious thought violates certain types of templates; religious cognition is as natural as any other type of cognition, yet used particular inference systems in a different way than other concepts. Religious concepts that are odd or ridiculous are not memorable and therefore not transmitted across generations. Religious concepts violate certain exceptions, while preserving others; this would indicate that religious theorizing is in some way dependent on the physical world to

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[12] Ibid., 62.
[13] Ibid., 64.
[14] Ibid., 73-74.
[15] Pascal Boyer and Charles Ramble, "Cognitive Templates for Religious Concepts: Cross-cultural evidence for recall of counter-intuitive representations" *Cognitive Science* (25: 2001), 535–564.

describe that which is religious. The important contribution of Boyer's work is that it shows that religious cognition is not ridiculous (as some scientist's would argue) nor is it complete abstraction, but it is dependent on the same type of cognitive architecture that enables us to reason in several domains, apart from religion.

Boyer's view also raises some concerns. If religious cognition is a strictly implicit cognitive process, it would seem to be the case that conscious reason has little to do with the development of religious beliefs. Religious beliefs are not 'reasoned,' but are simply the product of a misuse of implicit cognitive systems designed by evolution. In this sense, Boyer argues that religious beliefs are parasitic upon cognitive systems and may be understood as a misuse of these particular systems.[16] This type of definition misses the role of explicit cognitive systems in forming religious thoughts and the ability for conscious reason to contribute to the development of religious beliefs.

The Evolution of Language

Evolutionary psychology has also had a significant impact on theories of language, many arguing that language is somehow innate within evolutionarily designed modules.[17] This is used to explain the relative ease with which a child can learn language. Terrence Deacon has offered a different approach, describing the development of language as a co-evolving process dependent upon specific brain structures and language.

> It's not that our exaggerated prefrontal cortex was an evolutionary prerequisite for these many supportive language adaptations; rather, these features of languages have evolved to take advantage as well of other incidental prefrontal biases that symbolic evolution inadvertently produced.[18]

Language has evolved in such a way as to be easy for human children to learn, it has become an "intuitive and user-friendly interface."[19] As language has evolved, so has the human brain, in that humans have an enlarged prefrontal cortex relative to the other parts of the brain with many interconnections to other cortical and subcortical areas. Earlier brain research assumed that the reason for the human brain's computational capacity was due to its proportional size in relation to the rest of the body.[20] Deacon postulates that computational capacity is not due to relative size of the human brain, but that specific areas of the human brain became more developed (in some sense overdeveloped) to fit the cognitive demands of the human environment.[21] For the processing of language, it appears that the human development of the prefrontal cortex is particularly different from other closely related primates and is part of the reason for our ability for symbolic representation.

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[16] Boyer, *Religion Explained*, 191.
[17] See especially Steven Pinker, *The Language Instinct: How the Mind Creates Language* (New York: William Morrow, 1994) and Noam Chomsky, *Modular Approaches to the Study of the Mind* (San Diego: San Diego State University Press, 1984).
[18] Terrence Deacon, *The Symbolic Species: The Co-Evolution of Language and the Brain* (New York: W. W. Norton & Co., 1997), 146.
[19] Deacon, *Symbolic Species*, 107.
[20] Ibid., 146.
[21] Ibid., 185.

Development of Symbolic Representation

Deacon indicates three levels of representation for the development of language based on categories developed by C. S. Pierce: iconic, indexical, and symbolic.[22] Icons are the simple representation of a stimulus as it is; there is no distinction between that which is being represented and the representation itself. The next level, indices, is the formation of an association between two different icons. Pierce gives some examples of indices:

> I see a man with a rolling gait. This is a probable indication that he is a sailor. I see a bowlegged man in corduroys, gaiters, and a jacket. There are probable indications that he is a jockey or something of the sort.[23]

Deacon offers the example of a monkey warning call to indicate the presence of a predator. Over time the monkey is able to associate this call with an impending danger and thus to make certain avoidance behaviors.

The amazing leap for human cognition is the development of *symbolic* representation. Pierce initially defined symbols as:

> Any ordinary word such as "give," "bird," "marriage," is an example of a symbol. It is applicable to whatever may be found to realize the idea connected with the word; it does not, in itself, identify those things.[24]

A symbol is something that represents something else without having any intrinsic link to that which it is representing, it 'represents' or 'stands in for' some idea or concept that it points. Symbols provide a referential relationship about indexical relationships:

> This referential relationship between the words – words systematically indicating other words – forms a system of higher-order relationships that allows words to be about indexical relationships, and not just indices in themselves.[25]

Symbolic processing allows humans to represent abstract concepts, thought-patterns and events. It even allows humans to speak about concepts that are not perceivable, such as the idea of time, properties of molecules, or other conceptual frameworks.[26]

Top-down Processing

Symbolic processing allows persons to develop conceptual frameworks and in order for those frameworks to have an effect on cognition an additional process must be added, top-down processing. For this discussion, top-down processing is understood as the use of higher level or emergent mental representations for interpreting incoming stimuli and planning future behavior scenarios. In the immediate sense, top-down processing is a form of pattern completion. When a particular environmental condition presents itself, a mental representation completes the pattern by initiating certain behaviors. Persons interpret, organize and conceptualize incoming stimuli according to mental representations that give a type of coherence to the stimuli. This can occur through both conscious and unconscious processing. The easiest way to explain this phenomenon is by giving an example.

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[22] Ibid., see chapter 3.
[23] C. S. Pierce, "Logic as Semiotic: The Theory of Signs" in *Philosophical Writings of Peirce* ed. Justus Buchler (New York: Dover Publications Inc., 1955), 108.
[24] Ibid, 114.
[25] Deacon, *The Symbolic Species*, 83.
[26] Nancey Murphy and Warren S. Brown, *Did My Neurons Make Me Do It?* (unpublished manuscript) Chap. 4, p. 17.

G. Johanson performed a study in which he was attempting to understand whether persons could perceive form from motion.[27] He dressed up actors in black clothing and attached lights to several points on their bodies: elbows, knees, hands, etc. He then made movies of them doing various actions such as running, jumping and kicking in a dark room so that only the attached lights could be seen. Even though the test subjects could only see the lights in the films, they could readily identify the actions the actors were performing. So the persons were able to identify the form of a particular human action through the motion of nonhuman identifiers, specifically lights. Grossman et. al. later used this study to find a specific region in the brain that was activated during this process.[28] He and his colleagues found that there was significant neural activity in the posterior superior temporal sulcus, mainly in the right hemisphere. When subjects were shown a random association of lights, this brain region was not activated.

What this study suggests is that humans use higher-level complex conceptual patterns to interpret incoming stimuli in meaningful ways. In this case, a conception of human action is used to understand an arrangement of lights. This conception was developed through many experiences of watching persons perform actions in the environment and developing a concept "kicking," to understand this particular motion. So top-down causation is using a larger conceptual framework as an aspect of current processing about beliefs and actions. These conceptual frameworks help to provide structure and organization to our world and the way it is interpreted. We do not simply interpret the world from a neutral vantage point, but through our own grid of experiences, beliefs, and conceptions.

Religion as a Tradition

Alasdair MacIntyre is often associated with ethics, but his understanding of a tradition is particularly helpful in understanding how a religion can inform thought and behavior. This is not intended as a theory of religion, but rather a description of certain important aspects of a religious tradition. MacIntyre defined a tradition as "an historically extended, socially embodied argument, and an argument precisely in part about the goods which constitute a tradition."[29] The socially embodied argument is the particular narrative of a religious tradition. These are stories or narratives which provide a context for the actions of a particular community. Human action cannot be understood outside of the context in which a particular act is performed. Religion provides a particular narrative in which different actions or practices are understood in light of their meaning to a different context. For someone who is practicing the Eucharist, the Christian tradition provides a rich story describing the importance and significance of that act.

The "goods" of a tradition are embodied in practices. MacIntyre defines practices as:

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[27] G. Johansson, "Visual perception of biological motion and a model for its analysis" *Perception and Psychophysics* (1973, 14), 201-211.

[28] E. D. Grossman et. al., "Brain areas involved in perception of biological motion" Journal of Cognitive Neuroscience (2000, 12), 711-720. and E. Grossman and R. Blake, "Brain activity evoked by inverted and imagined biological motion" Vision Research (2001, 41), 1475-1482.

[29] Alasdair MacIntyre, *After Virtue: A Study in Moral Theory* 2nd ed. (Notre Dame: University of Notre Dame Press, 1984), 222.

> Any coherent and complex form of socially established cooperative human activity through which goods internal to that form of activity are realized in the course of trying to achieve those standards of excellence which are appropriate to, and partially definitive of, that form of activity, with the result that human powers to achieve excellence, and human conceptions of the ends and goods involved are systematically extended.[30]

"External" goods are those things that come about from doing a particular practice (money, fame, power), but other goods are internal, meaning that the goods can only be recognized by participants in the community. Practices also contain particular standards as a mark of excellence to the performance which are systematically extended through time and may be improved. The practice of medicine is an example of a skill that continues to develop and has improved over time. Religious practices may be rituals or festivals like marriage or acts of charity like feeding the poor.

Offloading Cognitive Tasks

D. Jason Slone points out that there is a significant difference between a person's religious beliefs and the official doctrines of a religious tradition.[31] Although Slone raises some important concerns, external factors play a larger role in the development of religious cognition, and may override implicit beliefs. Human intelligence is dependent upon particular aspects of brain functioning and gains much of its processing power through the use of external structures. So it is not simply a matter of cognitive ability, but also the structuring and manipulating of the environment in 'intelligent' ways to ease the processing load on individual persons.

> The idea, in short, is that advanced cognition depends crucially on our abilities to dissipate reasoning: to diffuse achieved knowledge and practical wisdom through complex structures, and to reduce the loads on individual brains by locating those brains in complex webs of linguistic, social, political, and institutional constraints.[32]

The easiest example of this would be using pen and paper to solve a multiplication problem. Most of us could not do a computation such as 7766x7789 without the use of the rules of multiplication to write the problem out. Most persons do not know the mathematical justification for this procedure; instead we break down the problem into simpler rules like 6 x 9, "carry the 5", etc. The mathematical justification is contained in the larger tradition of mathematical formulations, not within the specific 'math-user.'

Top-down Constraints

Although it is most likely the case that implicit cognitive systems constrain religious beliefs in particular ways, explicit beliefs constrain and act as a 'cause' in the development of religious beliefs. Through the use of top-down causation, religious conceptual frameworks can be used to interpret experiences and direct behavior. This

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[30] MacIntyre, *After Virtue*, 187.
[31] D. Jason Slone, *Theological Incorrectness: Why Religious People Believe What They Shouldn't* (Oxford: Oxford University Press, 2004).
[32] Andy Clark, *Being There: Putting Brain, Body, and World Together* Again (Cambridge: The MIT Press, 1997), 180.

does not mean that a religious person has to have a well articulated theological rationale for their behavior. Instead, they rely on their traditions to be a type of 'external memory' to contain more detailed rationales for their behavior. But this is not just an aspect of religious cognition, Thomas Kuhn originally pointed out that even science acts as a type of community with accepted paradigms.[33]

Persons are also able to consciously reflect on religious concepts and their connection to behavior. Through the use of top-down causation a particular religious belief can guide behavior in important ways. Let me offer a non-religious example. Imagine a person sitting at home with a piece of chocolate cake left over from an earlier party that evening. This person is currently on a diet to avoid sweets, but chocolate cake is one of her favorites. Cake is a tasty treat, so her first biological response would be to begin preparing her body for eating. Yet, as we learned from symbolic representation, humans have the ability to reflect on other strategies for dealing with the stimulus. It is at this point that she reflects on her diet and realizes that she has two different behavior scenarios that could lead to different results: (1) eat the cake and break her diet, which would lead her to gain weight or (2) don't eat the cake and continue to lose weight. These mental representations developed through interactions with the environment where she learned about the dangers of being overweight and the consequences of overeating. She also learned that staying healthy and losing weight requires her to limit the amount of desserts she eats.

Conclusion

For any study of religion to be helpful (especially to the adherents of that particular religion) and accurate (reflecting the causal factors involved in religion), those theories of religion need to involve top-down causation. What this essentially means is that higher levels of complexity (such as languages, culture, and the environment) play a causal role in the development of religious beliefs and experiences that cannot be explained by the bottom-up account in causal reductionism. The mind is not a 'ghost in the machine,' nor is it completely separated from the cultures and environments in which it is embedded; instead mind is a contextualized brain state involving a person in action feedback loops with the culture and environment.

A nonreductive view of religion will allow for the exploration of several cognitive factors involved in religion rather than giving precedence to implicit factors. Religion is a broad social, cultural, and interpretive process with several implicit and explicit cognitive systems involved in its transmission and conceptualization. Several different cognitive factors such as emotion, theory of mind, language, and conscious top-down agency contribute to religious cognition and the role of religious beliefs in action. Yet, these cognitive systems only provide a partial explanation. To properly understand the role of religion in human concepts, experiences, and action, the role of religion must be understood as a type of 'scaffolding' which structures our cognitive capacities. Human cognitive systems rely on the external structures of language and culture to offload certain cognitive processing demands.

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[33] Thomas Kuhn, The Structure of Scientific Revolutions 3rd ed. (Chicago: University of Chicago Press, 1996).