The Role of Religious Concepts in the Evolution of Human Cognition

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Abstract

In this chapter, we offer a suggestion for the place of religious concepts in evolutionary history, a suggestion that is counter current theories that religious concepts are simply epiphenomenal or the result of cognitive predispositions. In particular, we use various aspects of cultural learning theory to suggest religious concepts may have been an instrumental factor in the evolution of human cognition.

1. The Cultural Origins of Religious Concepts

Bjorklund and Pelligrini (2000) have proposed that the central tenet of developmental evolutionary psychology is to determine how a species-wide behavior is or has been adaptive, or how it has been associated with an adaptation. Given the ubiquity of religious concepts and behaviors in human culture, it is appropriate to consider these concepts within an evolutionary developmental psychology framework. Theorists have suggested various mechanisms by which religions and religiousness can be considered adaptive, including through sexual selection (Pyysiäinen 2008; Slone 2008) and collective action (Richerson & Boyd 2005), and citing evidence from research on the heritability of religiousness (e.g., D’Onofrio et al., as cited in Harris & McNamara 2008).
In contrast, scholars of the evolution of religious concepts specifically have reached the general conclusion that religious concepts are epiphenomenal to the evolution of human cognition (e.g., Atran 2002; Ber ing 2006; Boyer 2001; Kirkpatrick 2004). In this chapter, we explore an alternative hypothesis, namely that the development of religious concepts may have played an instrumental role in the evolution of human cognition.

Despite the ubiquity of religious concepts, the phylogenic processes involved in the ontogeny of religious concepts have rarely been considered within the field of cognitive development. In this chapter, we consider how the development of religious concepts can inform us about the social nature of the evolution of human cognition, particularly as the ability to learn from those around us is an important by-product of evolutionary pressures (Tomasello 1999). Despite our continued interest in understanding the cognitive factors involved in the evolution of, existence of, and belief in religious concepts, we agree with the cognitive developmentalists who argue that we cannot remove “culture” from conversations about cognitive predispositions either when referring to cognitive development more generally (e.g., Cole & Wertsch 1996; Gauvain, 2001) or religious concept development more specifically (e.g., Geertz 2008; Richert & Smith forthcoming). Within the area of cognitive development, even Piaget (1970) argued, “There is no longer any need to choose between the primacy of the social or that of the intellect: collective intellect is the social equilibrium resulting from the interplay of the operations that enter into all cooperation” (p. 114).

Given that religious concepts (likely) did not evolve as an adaptation in one mind, but within the social context of cultural evolution, the concepts themselves cannot be considered outside of the social context in which they have evolved or in which they develop.

Often, research into religious concept development and transmission has focused on a dichotomy between cognitive predispositions and cultural influence. Reflecting this dichotomy, early in the history of research into cognitive development and religious concepts, Elkind (1964) distinguished between spontaneous and acquired religion. Spontaneous religion is each child’s own attempts to interpret and explain the religious terms and ideas to which she or he has been exposed. Acquired religion incorporates the religious thoughts and ideas children learn from adults through imitation or instruction. The distinction between spontaneous and scientific concepts also emerged in Vygotsky’s
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(1986) work. Spontaneous concepts are developed as a function of the interaction between first-hand experiences and cognitive predispositions, whereas scientific concepts involve higher-order mental processes and concern information that requires instruction.

The implications of this distinction have been the focus of much research into the cognitive aspects of religious experience. Barrett and Keil (1996) distinguished religious ideas that are theologically correct from religious ideas that are intuitive. Many theorists within the cognitive science of religion have identified a similar distinction: cognitively optimal versus cognitively costly religion (Whitehouse 2004), intuitive versus explicit religious thought (Boyer 1994; Pyysiäinen 2004). Although this distinction is useful for conceptualizing the differences in how people think about religion, it masks the important fact that all religious concepts are learned or expressed in a social and cultural context. As such, evolutionary theories of religion should consider developmental factors in how children have evolved to learn from those around them and in what ways religious concepts reflect these evolutionary processes.

In this chapter, we rely heavily on Tomasello’s (1999; Tomasello et al. 1993) theory of cultural learning. Tomasello outlines a theory of cultural learning that, when applied to considerations of research into religious concepts, can illuminate some interesting possibilities about the evolution of religious concepts, similar to Wilson’s (2008) recent use of evolutionary theory to transform and organize facts about religion into a cohesive evolutionary theory of religion. Other scholars of the evolution of religious concepts have used this theory in various ways, primarily relying on the usefulness of Tomasello’s characterization of the ratchet effect for highlighting the importance of religious innovation (Whitehouse 2008) and learning religious rituals and practices through imitation (Kydd 2008). We use this theory in a slightly different way, as will become apparent below.

Much of the past research into the transmission of religious concepts has focused on the likelihood that certain concepts will be transmitted and remembered (e.g., Boyer 1994; Barrett & Keil 1996; Barrett & Nyhof 2006). These theories have generally settled on the notion that religious concepts are remembered and spread because they not only are minimally counterintuitive, but also rely on natural cognitive predispositions and processes (e.g., Boyer 2001). However, as suggest-
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ed above, we agree with Elkind (1970) that “any complete account of the origins of religion must deal both with individual and social processes of adaptation” (p. 35). Pyysiäinen (2004) reflected this stance when he argued true cognitive theories of religion should explain not only spontaneous religious thinking, but also explicit religious thinking. According to Pyysiäinen (2004), “1) religious concepts and beliefs are supported by quite ordinary (non-religious) cognitive processes in which intuitions are yet violated, and 2) the relative amount of explicit reasoning determines which type of religion will develop” (p. 127). This stance may suggest that the social processes of religious transmission “fill in” the content of religious concepts (Keleman 2004). However, theories of cultural learning would suggest that the social context provides much more than the content of religious concepts, the social context provides the structure of these concepts as well.

2. Cultural Learning

The social context of concept development is not limited to the verbal transmission of concepts. Social cognitive theories of cognitive development (e.g., Bandura 1989) and theories of cultural learning (e.g., Tomasello 1999) have suggested social interaction in cognitive development plays a fundamental role in shaping not only the content, but also the structure of children’s cognition. According to Vygotsky (1978), “Every function in the child’s cultural development appears twice: first, on the social level, and later, on the individual level” (p. 57).

Tomasello (1999) provides a theory of human evolution suggesting cultural transmission is a biological mechanism. According to Tomasello (1999), “Cultural transmission is a moderately common evolutionary process that enables individual organisms to save much time and effort, not to mention risk, by exploiting the already existing knowledge and skills of conspecifics” (p. 4). Tomasello (1999) argues in the course of human evolution, the capacity for representation may have been the primary catalyst causing Homo sapiens to split from other Homo species to begin a new and distinctly different evolutionary trajectory. The biological adaptation of a new form of social cognition spiraled into large-scale distinctions between the species.

Along this line, the idea of cumulative cultural evolution suggests that human ontogeny occurs in an environment of new artifacts and social
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practices that carry the collective wisdom of the social group through the course of cultural history (Tomasello 1999). This idea of cumulative cultural evolution is not unique to Tomasello’s approach; historically, many theorists have suggested a similar understanding of human’s involvement in culture (e.g., Dewey 1938/1963; Durkheim 1912/1947; Luria 1928; Vygotsky 1929). Development within this framework can be considered from three different perspectives: phylogenetic, historical, and ontogenetic (Tomasello 1999).1 Phylogenetically, humans’ species-specific cognitive capacities developed as humans evolved to identify with conspecifics and see others as like themselves. Historically, this identification led to the development of cultural artifacts and behavioral traditions that accumulate modifications over time. Ontogenetically, development occurs within the context of these artifacts and traditions, allowing children to benefit from the accumulated knowledge and practices of the species (Tomasello 1999).

According to Tomasello et al. (1993), cultural learning is uniquely human and indicates a type of social learning that other species do not share. What distinguishes cultural learning from other forms of social learning is the importance of social cognition in cultural learning. According to Tomasello et al., general social learning can be explained by multiple processes that do not require activating social cognitive processes. General social learning can occur through mere exposure to new ways of doing things, through drawing children’s attention to an object or location, and through local enhancement. In contrast, “the cognitive representation resulting from cultural learning includes something of the perspective of the interactional partner, and this perspective continues to guide the learner even after the original learning experience is over” (Tomasello et al. 1993, p. 496). Considering the development of religious concepts within this framework highlights some intriguing possibilities for the evolution of religious concepts.

2.1. Religious Concept Development and Cultural Learning

According to Tomasello (1999), languages have similar grammatical structures because the human capacity for language evolved before humans diverged into different populations as a result of identifica-

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1 These perspectives mirror the perspectives framing Vygotskian (1976) approaches to sociocultural development: ontogenetic, microgenetic, phylogenetic, and sociohistorical.
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tion with conspecifics. This hypothesis is different than hypotheses of an innate mechanism for language (e.g., Chomsky 1965; Pinker 1994), in that it highlights the fact that language and communication played an important role in the evolution of mental state understanding. A controversial suggestion from this hypothesis would be that we see a similar structure for religious concepts across cultures (Boyer, 2001), because religious concepts also evolved before humans diverged into different populations. If this is true, religious concepts should also be profoundly social in nature. Indeed, an examination of the research into cognitive predispositions that provide a foundation for religious concepts reveals this to be true.2

2.2. Social Cognitive Predispositions

As Elkind (1970) noted, studies using interviews to ask children directly about their concepts of religious things automatically tap into acquired religion. Thus, much research in the past decade into children's religious concepts has used techniques that do not require directly questioning children about their concepts. More recent research in the cognitive science of religion would suggest that a child's spontaneous religion is not solely an attempt to make sense of difficult theological concepts. Instead, this research suggests that children are equipped with a cognitive architecture that promotes acceptance of particular religious concepts.

According to the preparedness hypothesis, "children may be cognitively equipped to understand some aspects of God in a non-anthropomorphic way" (Barrett & Richert 2003, p. 300). Theories of the evolutionary origins of religious concepts have expanded this hypothesis into more general indications that certain natural cognitive predispositions may underlie religious concepts, perhaps as a by-product of evolutionary pressures (Bering 2006). Although we have discussed these predispositions in greater detail elsewhere (Richert & Smith forthcoming), we provide here a brief overview of the evidence suggesting religious concept development may rely on natural cognitive predispositions for interacting in a social environment, primarily predispositions for attributions of intentionality and essentialism. Although research into developing concepts of intention and essentialism provides compel-

2 For a more extensive review, please see Barrett and Richert (2003) and Richert and Smith (forthcoming).
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ling evidence that religious concept development may rely on natural cognitive predispositions for interacting with the social environment, we follow this review with an in-depth evaluation of Tomasello's Cultural Learning Theory and suggest that concepts often considered religious may have been integral in the evolution of these very cognitive dispositions.

2.2.1. Intention Attribution

For any scholar of human cognition, it should not come as a surprise that humans are prone to detecting agency and intentionality both in the environment and in those around them. What may surprise some scholars is how soon children (even young infants) demonstrate this propensity. For example, 5- to 8-week-old babies will imitate the facial expressions of an adult but not an object (e.g., Legerstee 1991; Meltzoff & Moore 1994) and will demonstrate different expectations about the self-propelled animacy of people as opposed to objects (Spelke et al. 1995). These early capabilities demonstrate how profoundly social the human infant is. This social nature is important evolutionarily, as newborn human infants are incapable of surviving without the assistance of others. Although these claims may appear to be commonsensical, it is important to note that from the very earliest ages, the experience of the human infant is profoundly social; in this sense, cognitive experiences cannot be separated from social context.

This bias toward intentionality has an influence on various aspects of children's involvement in both the social and physical world. For example, recent research has suggested that before the age of 9 or 10, children seem predisposed to reason about nature and natural objects as intentional and purposeful (Keleman 2004). Similarly, when children are asked to reason about how the first of several unfamiliar species appeared on earth, until about 10 years of age, children consistently endorse a creation-oriented explanation (Evans 2001). Other research has suggested that this bias toward intention attribution may make it fairly easy for children to learn about supernatural agents (e.g., Barrett & Richert 2003) and to attribute intentionality to an invisible agent (e.g., Bering & Parker 2006).

Previous research has indicated that young children do not understand some aspects of others' mental activity (Flavell 1999). In particular, preschool children tend to overattribute knowledge and perspective-tak-
ing to other agents (see Wellman et al. 2001). This tendency has several repercussions for religious concept development. First, children’s concepts of God’s mind are often theologically correct in the sense that the attributions of omniscience are correct for God and incorrect for humans (Barrett et al. 2001; Barrett et al. 2003; Richert & Barrett 2005).

Second, if children’s deficit in understanding mental states reflects an inability to simulate appropriate mental activities (Harris 1989), simulation constraints may prevent young children (and adults) from conceptualizing the mental activity—or lack thereof—of a deceased agent (Bering 2006). Indeed, Bering and colleagues found that kindergarten-aged children attributed the continuation of psychological, emotional, desire, and epistemic states to a dead mouse. However, older children and adults only attributed certain psychological states (e.g., emotions, desires, knowledge) as continuing (Bering & Bjorklund 2004; Bering et al. 2005). Thus, children’s early presumptions of continuation after death for multiple processes become refined to reflect continuation of psychological processes only. Supporting this conclusion, research by Harris and Giménez (2005) has suggested that children attribute more mental state continuation with age, particularly in the context of a religious narrative. Both of these lines of research support the ultimate conclusion that religious concepts, as other types of concepts, emerge and develop within a sociocultural context, becoming more refined according to the context of cultural afterlife beliefs.

2.2.2. Essentialism

According to Gelman (2004), “Essentialism is the view that certain categories have an underlying reality or true nature that one cannot observe directly but that gives and object its identity” (p. 404). Within the field of cognitive psychology, essentialism is generally used to refer to children’s developing understanding of category membership and what it means for something to be a member of a certain category. Children demonstrate use of essentialism in making category-based inferences as early as age 4 in some cases (Gelman 2003).

Recent research into concepts of the soul have suggested that from about 6 years of age, children raised in religious families profess belief in the soul, or some equivalent (Richert & Harris 2008). Bering (2006) suggests that the cognitive bias that promotes afterlife beliefs is also responsible for entertaining beliefs in an immaterial, immortal soul. In
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fact, Bering argues that belief in teleological function (intention), the afterlife, and the intelligent design of self are all related to an immaterial essence, often labeled soul (Bering 2006; Richert & Harris 2006). Additionally, child and adult conceptions of the soul cannot be attributed to a mislabeling or maturation of what is viewed as traits of the mind (Richert & Harris 2006; Richert & Harris 2008).

Adults and children alike clearly discriminate the soul from both the mind and the brain along the lines of function and stability (Richert & Harris 2006; Richert & Harris 2008). Whereas the mind is credited with cognitive functions and is clearly yoked to the life cycle (birth, development, and death), the soul is consistently associated with spiritual functions. Furthermore, the soul is not directly associated with the life cycle; it is viewed as unchanging, and present before birth and after death. Thus, research examining the role that presumptions about essentialism play in children’s developing religious concepts has begun to suggest that concepts of the soul may reflect a particular form of psychological essentialism.

2.3. Understanding Causal Relations

Recognizing that religious concepts likely emerge in the course of ontogeny based on social cognitive predispositions for interpreting the world, it is important to consider when in the course of human evolution these dispositions may have evolved. Important for the evolutionary story, Tomasello (1999) argued that although non-human primates have demonstrated some understanding of the relationship between antecedents and consequences in the physical realm, they do not demonstrate an understanding of the underlying, mediating forces that constitute that relationship. For example, non-human primates may anticipate that when the wind blows a piece of fruit will fall off a tree. The mediating force of that consequence is the limb shaking, and non-human primates do not demonstrate understanding of this underlying cause. Given these findings, Tomasello has argued that the uniquely human capacity for understanding mediating forces in the physical realm evolved after as the ability to understand and predict the behavior of conspecifics. This hypothesis could explain why religious concepts (even those about actions like religious rituals) are profoundly social in nature (e.g., Barrett & Lawson 2001).
Tomasello (1999) argues that an understanding of mental states as mediating causal forces was a (or the) primary factor in the evolution of human cognition, occurring before an understanding of physical mediating forces. One possibility is that the evolution of early religious (and supernatural) concepts occurred as a middle ground in the evolution of understanding physical mediating forces. In other words, if an understanding of the mental states of conspecifics was the first mediating force understood by humans, attributing mental states to unseen agents may have been the second mediating force understood by humans, an understanding that may have preceded the evolution of an understanding of physical mediating forces. If this is the case, concepts of the supernatural would have occurred early in evolutionary history as a product of the attribution of mental states to unseen beings as mediating forces of unexplainable events.

2.4. Imitation and Religious Practices

A final aspect of the role of the social context in cognitive development to consider is the important role of imitation. Within sociocultural theories, children's actions are often one of the primary emphases. One of the major tasks of development is to learn the behavior and activities of the culture, and to internalize the tools that support thinking (Gauvain 1998; Rogoff 1998). For example, within Vygotskian (1976) theory children begin to internalize the actions that they conduct in the presence of more experienced partners. Within cultural learning theory, imitation plays a key role as it constitutes the internalization of communicative intent (Tomasello 1999). In addition, children develop in the context of structured social activities that provide the children with opportunities for discerning the process and function of the activities, as well as the function of the social roles within the activities.

Social cognition, or the ability to identify with and take the perspective of other humans, is key to cultural learning (Tomasello et al. 1993). Tomasello (1999) argues internalization is a normative process of imitative learning. As such, imitation involves the internalization of communicative intent and the perspective of the model. It is important within this framework to conceptualize the structured social context within which children learn about religious concepts. As Kydd (2008) noted, imitation certainly plays a role in children's learning of religious rituals and practices. However, within the context of cultural learning, a child's imitation of rituals and religious practices involves internaliz-
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...ing the intentions, not only of the actor, but of the entirety of actors who have performed those actions over the course of evolutionary history. Thus, in imitation of religious practices, children take the perspective of other actors in learning how and why those actions are performed. Imitation, in this way, contributes to children's eventual development as competent members in a particular culture (or religion), as children learn to share the beliefs, perspectives, and activities of more mature members of the group.

If we consider rituals as culturally-symbolic action forms, it is important to consider what role rituals play in children's religious concept development. In a strict application of cultural learning theory, religious concepts may be internalized forms of ritual actions or of the intentions and perspectives underlying ritual actions. If this is the case, participation in religious rituals may have been a primary factor in structuring religious concepts over the course of evolutionary history. The particular form of these practices for our ancestors and in modernity would be expected to vary as a function of the specific cultural context as they would reflect an accumulation of cultural changes and practices. A preliminary hypothesis may be that as children develop initial competence in religious practices and action, cultural expectations may lead to the eventual integration of the meaning of these practices as specific religious concepts.

3. Conclusions

In conclusion, if religious concepts are not merely a byproduct of natural cognitive evolution, but an instrumental factor in the evolution of human cognition, research into the similar cognitive foundations of religious concepts can reveal much about the process of the evolution of human cognition. We have suggested a hypothetical scenario in which this could have occurred, based on Tomasello's (1999) theory of cultural learning. Specifically, the attribution of mental states as mediating forces for unseen conspecifics could have evolved into the attribution of mental states to unseen supernatural beings, perhaps preceding the attribution of physical mediating forces. This could have occurred before humans diverged into different populations, resulting in structurally similar religious beliefs and practices that reflect the profoundly social nature of human evolution. As children engage in these practices and are exposed to these beliefs, they internalize the perspectives...
of the previous generations of members of their religious communities. According to this account, understanding religious concepts and their ontological development is contingent on understanding the role of these concepts phylogenetically, potentially as catalysts in the evolution of human cognition.

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