Toward an Evolutionary Psychology of Religion and Personality

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ABSTRACT   Evolutionary psychology is an emerging paradigm for the social sciences that offers a powerful metatheoretical framework for personality psychology and, as I attempt to demonstrate in this article, for the psychology of religion as well. I argue that religion is *not* an evolved adaptation; rather, the diverse range of beliefs, behavior, and experience that we collectively refer to as religion emerge as *byproducts* of numerous, domain-specific psychological mechanisms that evolved to solve other (mundane) adaptive problems. These include mechanisms for reasoning about the natural world (naive physics and biology), about other people's minds (naive psychology), and about specific kinds of interpersonal relationships (attachment, kinship, social exchange, coalitions, status hierarchies).

Personality psychology is a natural home for the study of religion and spirituality. Scholars have long suspected that a predisposition toward religion is somehow inherent in human nature, and defining human nature—answering the question "what do we know when we know a person?" (McAdams, 1995)—falls within the province of this field. Second, the psychology of religion is largely concerned with questions of individual differences, the second principal focus of personality psychology. Third, religion is a profoundly important, organizing force in

many believers' lives: If psychologists seek to understand "the whole person," religion and spirituality cannot be ignored (Emmons, in press).

Given its ambitious goals, personality psychology requires, perhaps more than any other field of social science, an integrative theoretical framework for conceptualizing grand questions about human nature and individual differences. The emerging paradigm of *evolutionary psychology* (e.g., Buss, 1995; Tooby & Cosmides, 1992) holds considerable promise as a candidate for this role. Buss (1991) has provided an overview of personality psychology from this perspective, as well as an edited volume of the *Journal of Personality* (1990) on applications of evolutionary psychology to the study of personality. The purpose of the present article is to show how this paradigm offers a powerful framework for the psychology of religion as well.

A Contemporary Evolutionary-Psychological Perspective

Space does not permit a review or critique of the many theories that have suggested, either implicitly or explicitly, a role for evolution in understanding religion. Instead, I briefly summarize below some general ways in which the framework I propose differs from other related perspectives.

1. Contemporary evolutionary psychology (hereafter referred to as *EP*) is grounded in modern evolutionary biology. Unlike older evolutionary perspectives, it incorporates many crucial theoretical advances from the last few decades, such as Hamilton's (1964) work on inclusive fitness and kin selection, Williams' (1966) critique of group-selectionist models, and Trivers' (1971, 1972) theories of reciprocal altruism and parental investment. This distinguishes my approach from previous theories of religion that rest on simplistic conceptions of "instincts" (e.g., Le Bon, 1903), Lamarckian models of evolution (e.g., Freud, 1913/1946), group-selectionist models of evolution (e.g., Wilson, 1978),[1] and other discredited notions such as ontogeny-recapitulates-phylogeny (Hall, 1882).

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1. Although Wilson (1978) is not naive about the issues involved in individual- versus group-level selection, he clearly ascribes greater power and importance to the latter than do most contemporary theorists.

2. EP differs from earlier sociobiological models in identifying the construct of *psychological mechanisms* as a crucial level of analysis (Cosmides & Tooby, 1987). Psychological mechanisms are conceptualized as information-processing modules designed by natural selection to attend to certain features of the environment, process this information according to specific algorithms, and generate behavioral, cognitive, and emotional output, in ways that solved recurrent adaptive problems faced by our ancestors—just as organs in the remainder of the body are each designed to perform a specific adaptive function. It is these mechanisms, not their behavioral or psychological products, that are adaptations whose existence is explained by natural selection. This perspective shifts the focus of analysis away from the search for adaptive functions of religious experience, belief, or behavior per se, and toward an attempt to identify the psychological mechanism(s) by which these are produced.

3. Inherent in this view of psychological mechanisms is a useful model for conceptualizing the respective roles of "nature" and "nurture" in producing behavior. Williams (1966) offers as an analogy the mechanism in human skin that produces calluses in response to friction. Friction ("nurture") does not produce toughened skin in the absence of a callus-producing mechanism (in fact, it has the opposite effect on most surfaces); likewise, the mechanism ("nurture") alone does not produce calluses in the absence of friction. All behavior is the product of environmental input processed by psychological mechanisms—that is, both nature and nurture. One important implication of this view is that nature and nurture (or genes and environments, etc.) are not conceptualized as opposing forces, as implied by theories that view religion as a cultural device designed to tame our selfish biological nature (e.g., Campbell, 1975; Freud, 1927/1961).

4. Another implication of the mechanism-behavior distinction is that although many or most psychological mechanisms are viewed as species-universal adaptations, behavioral variability across individuals and cultures is explained by EP largely in terms of environmental rather than genetic sources.[2] Notwithstanding some

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2. Some important exceptions include sexually differentiated and frequency-dependent adaptations.

heritable variability in callus-producing efficiency, the lion's share of variability in the incidence of calluses is explained by differential experience (e.g., walking barefoot, playing guitar). EP should not be confused with behavior genetics (D'Onofrio, Eaves, Murrelle, Maes, & Spilka, this volume): Whereas the latter focuses on how biology (genes) makes us different from one another, EP focuses primarily on how we are all the same.[3]

5. EP does not view culture as antagonistic to evolved psychology, but it does not view the two as independent, either. A common misconception is that at some point in human history biological evolution ceased and a distinct and independent process of "cultural evolution" took over (Pinker, 1997). However, culture itself needs to be explained, and cannot be understood without reference to the (evolved) psychology of the people who construct it (Pinker, 1997; Tooby & Cosmides, 1992). Sperber (1996) likens the study of culture to the distribution and transmission of infectious disease: Just as epidemiology must be grounded in a proper understanding of pathology, the study of culture cannot proceed fruitfully without a proper understanding of (evolved) human psychology.

6. According to EP, psychological mechanisms are both highly *numerous* and *domain-specific*, reflecting the diversity of adaptive problems faced by our ancestors (Tooby & Cosmides, 1992). The idea that our cognitive architecture is modular emerges independently from a variety of research traditions, including modern cognitive neuroscience; EP contributes to this perspective by offering bases for predicting and understanding the particular assortment of mechanisms that characterize our species' evolved psychology (Cosmides & Tooby, 1994). This view contrasts sharply with much theorizing in personality psychology that attempts to reduce behavior to just one or a few highly general motives or processes (Buss, 1991), as well as with social-scientific theories that similarly attempt

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3. The relationship between evolutionary psychology and behavior genetics is a complex one, with some interesting implications. For example, several authors (Hay, 1994; McClenon, 1997; Wulff; 1991) imply that high heritability of religiousness constitutes evidence in support of the claim that religion is a biological adaptation. As Tooby and Cosmides (1987) have demonstrated, however, traits representing adaptations should in fact display *low* heritability, because natural selection tends to reduce variability in the process of eliminating less adaptive variants and fixating the population gene pool at a local optimum.

to explain religion in terms of one or a few general processes or motives. The EP framework I propose thus differs from other theories of religion in presupposing that the tremendous diversity of religious belief, experience, and behavior is undergirded by a large number of distinct motives and mechanisms, none of which is necessarily primary or most fundamental with respect to religion.

7. Perhaps the most important difference between my approach and most previous evolution-related theories of religion is that I do not postulate the existence of any kind of "religious instinct" or psychological mechanism evolved for the function of producing specifically religious thought or behavior. Rather, as I explain in the next section, I argue that religion can be understood as a byproduct of a variety of motivational and cognitive mechanisms that evolved for other purposes.

Religion as a Byproduct, Not an Adaptation

Most evolution-related approaches to religion begin with the question, "What is (was) the adaptive value of religion?" This question is potentially misguided because it presupposes that religion (or some predisposition toward it) is an *adaptation*. However, adaptations—features or traits designed by natural selection for a particular adaptive function—are only one product of evolutionary processes. Evolution also produces various kinds of byproducts, including what Gould (1991) has termed *spandrels* and *exaptations*. For present purposes the technical distinctions among these types are not crucial, and Gould himself is inconsistent in their usage (see Buss, Haselton, Shackelford, Bleske, & Wakefield, 1998, for a discussion). The essential distinction here is whether (a) one or more psychological mechanisms have been designed by natural selection specifically for the function of producing religious belief, experience, or behavior (i.e., an *adaptation*),[4] or (b) religion is produced as a *byproduct* of psychological mechanisms

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4. Another possibility is that religion is a *co-opted exaptation*, which results when an existing adaptation is further refined by natural selection in the service of a new adaptive function; a widely cited example is birds' wings, which are thought to have evolved originally in the service of thermal regulation but were later co-opted for flight (Buss et al., 1998). The distinction between co-opted exaptations and adaptations is not crucial here because an explanation of religion based on either involves the assumption that we possess religion-specific psychological mechanisms, in contrast to the alternative view of religion as a *byproduct*.

that were designed by natural selection for other purposes. I believe there are several reasons to adopt the latter view.

First, it is the more theoretically conservative position. Williams (1966) argued against overzealous application of the adaptation construct, and outlined numerous strict criteria that must be met to establish that a trait or characteristic represents an adaptation. To prematurely identify a feature as an adaptation, and then spin a yarn about its adaptive value, invites the criticism of post hoc storytelling of which sociobiologists have long (though sometimes unfairly) been accused. Before positing religion-specific adaptations, we should first determine whether other well-known mechanisms can account for the phenomena of interest. This is not to say that religion-specific mechanisms cannot or do not exist, but only that the burden of proof should be on those who claim that they do.

Second, in order for a religion-specific mechanism to have evolved via natural selection, it would have to have reliably solved an adaptive problem faced by our ancestors. "Religion," however, refers to such a diverse and multifaceted constellation of beliefs and behaviors that is highly unlikely to be the product of a unitary adaptation with a single identifiable function. Scholars have for centuries sought the elusive common thread that runs through all religions and distinguishes them from other phenomena, with no consensus in sight. Any attempt to identify "the" adaptive function of religion is likely to explain some aspects of religion but not others. Instead, as noted earlier, it seems likely that numerous distinct psychological mechanisms, designed for a variety of distinct adaptive functions, underlie religion (and related phenomena such as magic, superstition, and other paranormal beliefs).

Third, with respect to this diversity and complexity, religion resembles many other activities in modern life that clearly reflect evolutionary byproducts rather than adaptations. Humans do not possess adaptations designed for playing tennis, driving automobiles, or solving calculus problems, for example. Instead, the performance of such tasks is motivated and enabled (as well as constrained) by adaptations that were designed by natural selection for other functions. Both Gould (1991) and Pinker (1997)—whose views about EP could hardly be more different— mention religion among their examples of evolutionary byproducts,

along with other prominent cultural products as reading, writing, and fine arts.[5]

Although some aspects of religion, defined broadly, have been around much longer than racquet sports or advanced mathematics, we do not (and probably never will) know if they are sufficiently ancient for biological evolution to have shaped them directly for this purpose. It is generally assumed that little if any genetic evolution has taken place in *Homo sapiens* over the last 50,000 years or so (Diamond, 1992). Many contemporary religious phenomena, such as complex theistic belief systems and denominational institutions, are clearly modern inventions. Even if our distant ancestors or their Neanderthal cousins did have identifiably religious or protoreligious ideas, however, these (presumably rudimentary) ideas can probably be explained as byproducts of other cognitive and motivational systems as well.

Fourth, although it is possible that one or more religion-specific mechanisms exist, it will be difficult to make a compelling theoretical case for one. I will note here just a few of the potential pitfalls that must be avoided. (a) Per modern evolutionary theory, simplistic good-for-the-group hypotheses must be avoided. The mechanism must have enhanced the inclusive fitness of individuals relative to alternative mechanisms.[6] (b) The hypothesis must explain how the mechanism's adaptive benefits translated into real advantages in reproductive success, such as increased probability of survival to reproductive age, enhanced mating opportunities, or increased production or fitness of own and/or relatives' offspring. Although religion might serve (or have served in the past) proximal functions such as boosting self-esteem or resolving existential angst, natural selection is blind to purely psychological consequences. (c) The hypothesis should not assume the existence of yet other unexplained mechanisms. For example, an explanation of religion as an adaptation for ameliorating fear of death begs the question as to why human minds would be built to fear death in the first place. (d) The hypothesis needs to explain how the mechanism reliably and predictably produces benefits

5. Both Gould (1991) and Pinker (1997) use the confusing term *exaptation* in this context, but their intended meaning is clearly consistent with what Buss et al. (1998) refer to as a *byproduct*.
6. Williams (1966) showed that although group-level selection is theoretically possible under certain limited conditions, these conditions are unlikely to have been met in human evolution.

that outweigh likely costs. A propensity for mystical experiences could just as well drive people apart as bring them together; unbridled willingness to submit to authority is open to rampant manipulation by competitors; supernatural beliefs often create at least as much anxiety and fear as they alleviate.

An EP analysis of religion as a byproduct (of other aspects of our evolved psychology) must take a different form than if religion were postulated to be an adaptation. Buss et al. (1998, p. 541) explain that an evolutionary functional analysis of byproducts, irrespective of their current co-opted function (or lack thereof), "must involve (a) an understanding of the evolved mechanisms that make humans capable of performing the behavior, and (b) an understanding of the evolved cognitive and motivational mechanisms that led humans to exploit such capabilities." The purpose of the present article is to sketch a framework, illustrated by a few concrete examples, for doing exactly this with respect to religion.

Overview of Some Key Psychological Mechanisms

As a preview to the remainder of this article, I list briefly below the "mid-level" evolutionary psychological theories (Buss, 1995) and specific families of psychological mechanisms to which I will refer in the remainder of the article. There are certainly many more that might be included, and they could be organized in a variety of ways, but as presented they will provide a general framework around which to organize the subsequent discussion.

Naive physics and biology.   Recent research suggests strongly that children's cognitive development is undergirded by a variety of innate, domain-specific mechanisms for categorizing and reasoning about the natural world. For example, infants display a kind of *naive* (or *intuitive*, *commonsense*, or *folk*) *physics*: At very early ages infants understand that objects have constancy, travel in continuous trajectories, and so forth. They also spontaneously and reliably distinguish animate from inanimate objects and invoke different principles of inference (e.g., causal reasoning) in these domains: When an inanimate object is seen to move with no visible external cause, for example, young children readily attribute the movement to an invisible, internal force within the object (Gelman,

Coley, & Gottfried, 1994). With respect to living things (i.e., *intuitive biology*), young children spontaneously carve up the world into categories of "natural kinds," each of which is perceived to be characterized by a distinct "essence" that is invariable across superficial variations. This essentialist bias continues throughout adult life (Gelman et al., 1994).

Naive psychology and theory of mind. Infants also come equipped with rapidly developing mechanisms of *naive psychology*. At a very young age they begin to ascribe people's behavior to beliefs, desires, and plans, and to understand the difference between reality, on the one hand, and other people's knowledge about reality. Objects displaying certain patterns of motion are readily ascribed goals, desires, and motives by young children as well as adults (Dasser, Ulbaek, & Premack, 1989; Heider & Simmel, 1944). This collection of mechanisms has been labeled the Theory of Mind Module (ToMM) by Leslie (1994) and Baron-Cohen (1995).

Intrasexual competition. Individuals within a species compete most directly with members of their own sex for resources and for mates; in turn, the opposite sex chooses mates at least in part based on the outcome of this competition. Sexual asymmetries arise because in most species, females have a greater minimal investment in producing and caring for offspring (gestation, nursing) than do males (Trivers, 1972). Males in particular compete amongst themselves largely with respect to acquisition of resources, status, and power—qualities that females value in mates for investment in offspring (Buss, 1992).

Kin selection and nepotism. In addition to one's own survival and reproductive success, the survival and reproduction of close kin provides an alternative path to genetic success in future generations. Investment in one's offspring is a clear example, but nepotism more generally is favored to varying degrees depending on the cost to the individual, the benefit to the recipient, and the degree of genetic relatedness (Hamilton, 1964). Consequently, humans (and many other organisms) possess psychological mechanisms for estimating relatedness and consequently behaving more altruistically toward kin than toward nonkin.

Reciprocity and social exchange. Another family of mechanisms that can produce apparently altruistic behavior are those concerned with

exchange of resources or assistance, which is beneficial to both parties if the cost of helping is small and the benefit to the other party is large (Axelrod, 1984; Trivers, 1971). This strategy works, however, only if reciprocation is monitored and enforced, and a persuasive line of research demonstrates the existence of a dedicated mechanism for detecting cheating in social exchange (Cosmides & Tooby, 1992). Perhaps the best-known form of social exchange is *reciprocal altruism*, in which reciprocation is delayed in time; however, social exchange can take several other forms as well (Tooby & Cosmides, 1996).

Attachment.   The most obvious example of kin-based altruism is parental caregiving toward offspring. In many species characterized by an extended period of development and parental caregiving, mechanisms are activated in offspring to capitalize on and maximize receipt of parental investment. The attachment system (Bowlby, 1969) is such a system, designed to provide protection to helpless infants by maintaining proximity between infants and caregivers. The system is activated by a variety of cues of potential danger, in which case the caregiver is sought as a *haven of safety*; at other times, the attachment figure provides a *safe haven* as a base for confident exploration of the environment. Hazan and Shaver (1987), and many researchers since, maintain that the attachment system is also an important component underlying adult love relationships.

Intergroup bias and coalitional psychology.   Although not typically cast in evolutionary terms, social-psychological research clearly demonstrates that people readily classify others into in-groups versus out-groups and treat members of these groups differently (Brewer, 1979; Tajfel, 1981). Such coalitions range from friendship pairs and small groups to villages, tribes, and nations, where the issues begin to shade into patriotism, collectivism, and nationalism. Like that of our chimpanzee cousins (Diamond, 1992; Wrangham & Peterson, 1996), human history has always been characterized by regular if not constant conflicts between groups over territory, resources, and mates (Betzig, 1986; van den Bergh, 1975).

Religious Phenomena and Psychological Mechanisms

In the remainder of this article, I illustrate how some of the major dimensions or aspects of religion might be understood as a (by)product of these particular suites of evolved mechanisms. Although space limitations permit little more than a sketchy outline of this perspective, I hope it will suffice to stimulate interest in, and perhaps motivate new research on religion motivated by, EP.

Unseen Forces, Spirits, and Animism

Beginning perhaps most notably with Tylor (1873), theorists have long sought the roots of religion in the cognitive processes by which humans perceive and understand their environment (Guthrie, 1993). Recent research in cognitive science, informed by an evolutionary perspective, offers a contemporary basis for this approach. The early appearance and rapid development in children of domain-specific mechanisms for categorizing and reasoning about the natural world suggest that humans have evolved "modules for objects and forces, for animate beings, for artifacts, for minds, and for natural kinds like animals, plants, and minerals" (Pinker, 1997, p. 315).

　Many of the simplest, and probably oldest, forms of religious belief can be viewed in terms of the (mis)application of such reasoning mechanisms beyond their intended domains. For example, it seems a small cognitive step from perceiving an underlying "essence" that distinguishes natural kinds from one another—for example, the essence of tigerness that makes a tiger a tiger despite superficial transformations of appearance—to conscious belief that inanimate objects are possessed by spirits or "mana." The widespread phenomenon of *totemism*, in which differences between social groups are symbolized by differences between natural species, has long been regarded by anthropologists as involving a cognitive link between reasoning about natural kinds or species and reasoning about human social categories. It remains unclear, however, whether this involves the transfer of natural-kinds reasoning to social categories, or vice versa (Hirschfeld, 1994). Guthrie (1993) offers a comprehensive theory of religion based on the ideas that (a) application of innate reasoning modules concerning animate objects to inanimate ones (*animism*) gives rise to belief in magical forces, and (b) application

of naive psychology modules to nonhuman agents (*anthropomorphism*) gives rise to belief in personalized spirits and deities.

If animism, anthropomorphism, and the like represent errors of interpretation, as suggested above, why are these particular kinds of errors so common? Boyer (1994) suggests that the importing of naive theories about one domain (e.g., psychology) into another (e.g., inanimate objects) produces a kind of "cognitive optimum" that makes an idea sufficiently attractive and appealing to be retained and transmitted: The hybrid belief is intriguing because it violates certain commonsense assumptions, but at the same time appears plausible because it is consistent with so many others (see also Sperber, 1996). Wenegrat (1990) suggests that because our brains are designed largely to process social information, social-cognitive schemata are readily activated even by nonhuman agents. Guthrie (1993) argues more specifically that perceptual and cognitive systems are inherently biased toward higher-level interpretations whenever perceptual input is ambiguous: It is generally a safer bet to mistake an inanimate object for an animate one (e.g., a stick for a snake), or a human for a nonhuman, than the other way around. In general, our information-processing machinery is prone to certain kinds of systematic errors because natural selection has designed brains to interpret the world in ways that are adaptive, not necessarily truthful (Alcock, 1995).

Once unseen forces are identified, it seems inevitable that people would try to find ways to manipulate them via *magic*. The ways in which they do so may also reflect psychological mechanisms designed for reasoning in particular domains. For example, Vernon (1962) suggests that the rationales underlying homeopathic (imitative), repetitive, and contagious magic are, respectively, "that like produces like," "that events which have been observed to occur simultaneously or to follow a particular sequence will continue to follow the same pattern," and "things which have once been together must forever afterward . . . have a magical influence on one another" (pp. 65–67). Each of these seems to reflect evolved inferential rules of naive physics or biology. The latter might be related to the emotion of disgust—a mechanism designed to encourage avoidance of potentially disease-laden objects which do in fact conform to a "law of contagion" (Rozin, 1996). It is also noteworthy that the goals of magic are typically entirely mundane and reflect the same evolved desires and motives as other kinds of behavior—such as acquiring resources, attracting mates, thwarting competitors, and assisting kin.

Deities and Other Supernatural Beings

The unseen forces of nature take on more or less anthropomorphized form as deities and other types of supernatural beings in most societies (Guthrie, 1993), opening the door for mechanisms dedicated to *social* cognition, such as ToMMs, to come into play. In Wenegrat's (1990, p. 112) words, "Humans, in short, are social game players, and social game players are prone to invent gods who will then be used in social games." Consistent with this idea, supernatural beings everywhere tend to have only one or a few "super" characteristics, but otherwise are conceived in ordinary human terms (Boyer, 1994; Pinker, 1997; Sperber, 1996): A deity might be omniscient and invisible, but otherwise display the full range of ordinary human emotions, desires, and motives. In polytheistic systems, the gods typically display social organization and interaction largely consistent with ordinary human relationships: They mate and have offspring, quarrel, construct coalitions, and vie for power, just as humans are understood to do.

Different categories of interpersonal relationships—for example, relationships with offspring, friends, and potential mates—pose qualitatively different sets of adaptive problems, and we possess a diverse collection of domain-specific mechanisms for solving them (Daly, Salmon, & Wilson, 1997). Many such mechanisms appear to be activated, to varying degrees in different belief systems, with respect to deities.

Kinship.   Perhaps the most common form of supernatural being across cultures is that of dead ancestors; ancestor worship in one form or another is universal across societies (Steadman, Palmer, & Tilley, 1996). Smart (1976, p. 36) notes that dead ancestors "are generally assumed to be interested in some way in the continuance of the line"—from an evolutionary perspective, just like living ancestors. Other common aspects of ancestor worship reflect mutual altruism consistent with kin selection theory: The living attempt to help the dead by burying helpful artifacts or other possessions, and seek (and expect) help with their own worldly affairs.

Attachment.   The idea that God is perceived much like a parent has a long history in psychology (e.g., Freud, 1927/1961). Whether or not God is perceived consciously as a parent (e.g., "Father"), a wide variety of

religious beliefs, behaviors, and emotions seem consistent with the idea that beliefs in God involve activation of attachment mechanisms.

Wenegrat (1990) reviews a variety of "undisguised attachment themes" in beliefs about deities, ranging from maternal deities of ancient religions to the Virgin Mary of Catholicism, as well as other beliefs and behaviors suggesting the role of attachment mechanisms. Elsewhere I have presented extensive reviews of the psychology of religion and attachment literatures to make the same case (e.g., Kirkpatrick, 1999), and shown empirically that individual differences in interpersonal attachments are related to religious beliefs in theoretically meaningful ways (Kirkpatrick, 1997, 1998; Kirkpatrick & Shaver, 1990, 1992).

Power, status, and leadership.   One role often ascribed to the gods is that of the head of the power and status hierarchy: the ultimate king or chief. Many theorists searching for an evolutionary basis for religious belief have pointed to our willingness to submit to powerful figures or authorities as a basis for belief in gods (e.g., Hardy, 1966). In Burkert's (1996, p. 81) words, "Religion is generally accepted as a system of rank, implying dependence, subordination and submission to unseen superiors. The awareness of rank and dependence in religion is particularly clear in all the ancient religions." In polytheistic systems, there is typically a "high God" at the top of a divine status hierarchy (Smart, 1976).

Many common forms of religious behavior are understandable from this perspective. For example, much religious ritual reflects the kind of "veneration and submission" people display toward high-status individuals, as do specific behaviors such as bending or bowing with outstretched hands and other acts of submission and praise (Burkert, 1996).

Social exchange.   To the extent that deities are not perceived as kin, interaction with them should be guided by principles of social exchange, including reciprocal altruism. Burkert (1996, p. 135) notes that "the idea of mutual gifts exchanged between gods and men has quite an old pedigree." However, dealing with particularly high-status individuals (including deities) poses a serious exchange problem given the asymmetry in ability to benefit the other. Humans consequently have proved remarkably creative in inventing forms of offerings to deities, including the construction of impressive monuments, works of art, and various kinds of sacrifice. The intention, of course, is that "if we please the gods—with sacrifices, food offerings, or prayer—we expect to be

rewarded with military victory, good harvests or a ticket to heaven" (Ridley, 1996, p. 131). In some cases, as in the Old Testament, social-exchange agreements with gods take the form of formal covenants.

Social-exchange reasoning also may underlie a particularly common form of magical thinking, belief in a *just world* (Lerner, 1980), which has been implicated in other forms of religious belief (Pargament & Hahn, 1986). This refers to the widely held (though often tacit) belief that people "get what they deserve"—that the good are rewarded and the bad punished. The human side of an implicit or explicit contract with God typically involves humans behaving in certain ways that God desires. Thus, we expect others and ourselves to receive rewards when we keep our part of the bargain, and to receive punishments when we do not.

Priests, Medicine Men, and Shamans

All religions include definitions of special human roles—ranging from shamans to priests—that may or may not be assumed to involve special powers, abilities, or connections with the supernatural. Perceptions of these leaders involve many of the same psychological mechanisms discussed in the previous two sections. Wenegrat (1990) discusses the role of religious leaders as attachment figures and notes, along with Batson (1983), the use of terms such as "father" that may reflect, or encourage, perceptions of kinship ties. Perhaps most important, human leaders hold high-status positions that evoke respect and awe; such leaders occupy an intermediate status in a two-tiered power hierarchy between the gods and the masses (Burkert, 1996). The idea that our respect for, and willingness to submit to, powerful authority figures has been proposed by many theorists as an important psychological basis for religion (e.g., Hardy, 1966; Pinker, 1997; Wilson, 1978).

Other aspects of our domain-specific cognitive architecture suggest additional insights into the role of, and perceptions of, religious leaders. Naive biological thinking about natural kinds and the "essences" perceived to underlie them leads, according to Boyer (1994), to perceptions of high-status religious leaders as having a kind of special essence, as if belonging to a different "natural kind." Consistent with this, the special qualities of certain religious (and, sometimes, secular) leaders are often believed to be inherited; consequently, such positions are often passed down across generations. Boyer notes that even when religious roles are defined explicitly as criterion-based, people's "charismatic proclivity"

leads them to ascribe special qualities or essences to these leaders anyway.

The nature of religious beliefs themselves may further enhance the power of authority figures within religion. To the extent that religious beliefs combine intuitive (i.e., consistent with naive physics, biology or psychology) and counterintuitive (i.e., violations of such principles) components, Sperber (1996, p. 72) suggests that the authority of religious leaders takes on added force. In his words, "With half-understood ideas, what is known as the 'argument of authority' carries full weight." Pinker (1997, p. 557) summarizes the general point by concluding that religion "exploits people's dependence on experts."

The behavior of religious leaders themselves is likely to be influenced by multiple motivational systems. On the plus side, viewing themselves as attachment and/or parental figures might give rise to nurturing, altruistic behavior reflecting operation of parental-investment mechanisms toward their "children." On the minus side, their behavior—particularly that of males, who historically have monopolized primary power positions in religious institutions—may reflect competition for power, status, and mates. Abuses of power in the name of religion are well documented throughout the history of religion, from the medieval institution against which Martin Luther protested to modern-day cases of bogus faith-healing and sexual abuse.

Groups and Institutions

Perhaps the most common function ascribed to religion by social scientists is the promotion of social cohesion, mutual cooperation, and subordination of individuals' self-interest to that of the social group (e.g., Crippen & Machalak, 1989; Durkheim, 1912; Wilson, 1978). As noted previously, it is doubtful that we possess adaptations that predispose us to behave in this way. This is not to say that we are incapable of constructing institutions, including religions, to advance the common good at some cost to individuals. In modern states, we construct governments for this purpose.

The government example also illustrates the degree to which we are *not* innately predisposed to self-sacrifice on behalf of the common good: People work hard to find legal (or illegal) ways to reduce their tax liabilities, and complain endlessly about the distribution of benefits. Government systems work only because of built-in methods for coercing

participation. If religion does indeed promote self-sacrifice on behalf of the group—and surely it succeeds at this to some extent—how does it accomplish this? In part, as several theorists have suggested, religions capitalize on *other* existing mechanisms designed to promote cooperation in more circumscribed contexts.

Kinship.   Several theorists have pointed to the role of kinship psychology in group religion. From an evolutionary perspective, Batson (1983) suggests that the widespread use of kinship terms in religion (e.g., "brotherly love," "brothers and sisters") may function to promote prosocial behavior. This line of argument has been developed most fully by Crippen and Machalak (1989), who attempt to explain religion generally in terms of a "hypertrophied kin recognition process" (p. 74) in which "kin recognition mechanisms are 'usurped' to form communities of fictive kin" (p. 68). As discussed in a previous section, totemic and other belief systems in which deities or spirits represent shared ancestors may further encourage individuals to treat each other as if kin (Steadman et al., 1996). Wenegrat (1990, p. 74) points to people's belief in God as a universal parent "who has asked them to be their brother's keeper."

Self-interest.   Still, the problem remains of how such beliefs might spread successfully despite competing selfish interests of individuals. For example, conflicts of loyalties between real and fictive kin are inevitable. Pinker (1997) points out that all religious and political movements attempt to subvert families in an attempt to redirect loyalties toward the larger group. If individuals do not perceive benefits to themselves and/or their (true) kin, why would be willing to adopt or promote such views? This is a difficult issue that cannot be resolved here, but I will note two possibilities. First, it is in the interests of each individual to promote such views in *other* individuals, in order to garner the benefits of others' altruistic acts. This is true especially of the relatively disadvantaged, who have much to gain by promoting altruism among the rich (Badcock, 1986), and of group leaders, who benefit from perceptions of group success. Second, individuals can be induced to behave in ways that benefit the group when cooperation is enforceable and cheaters detected and punished, as with governments. The belief that cooperation and altruism are sanctioned—as well as monitored and enforced—by powerful supernatural forces or deities seems particularly effective in encouraging such behavior.

Coalitions. Another aspect of our evolved psychology relevant to this topic concerns the construction and maintenance of coalitions and alliances. Religious teaching "has almost always emphasized the differences between the in-group and the out-group: us versus them; Israelite and Philistine; Jew and Gentile; saved and damned; believer and heathen; Arian and Athanasian; Catholic and Orthodox; Protestant and Catholic; Hindu and Muslim; Sunni and Shia" (Ridley, 1996, p. 191). Several theorists have suggested that religion addresses an innate desire to be included in groups or coalitions, thus explaining the success of cult recruitment techniques that focus on the lonely and disaffiliated (Galanter, 1978; Wenegrat, 1990).

The effects of such coalitional thinking are, of course, double-edged. On the one hand, it may (like kinship mechanisms) have beneficial effects within the in-group in terms of enhancing cohesion, cooperation, and altruism. On the other hand, these within-group benefits come necessarily at the expense of the outgroup and contribute to between-group conflict. Religion has fueled—in many cases, by explicitly condoning, justifying, or motivating—countless wars between nations and conflicts within them. Given that such in-group/out-group thinking is an important contributing factor to ethnic prejudice (van den Bergh, 1981), this perspective is potentially useful for addressing the long-standing question about the relationship between religiosity and prejudice, particularly as it is moderated by such variables as fundamentalism and right-wing authoritarianism (Hunsberger, 1995).

Morality, Ethics, and Law

Another universal feature of religious beliefs systems is a set of beliefs about (or codification of) morality and ethics. In many cases it is difficult to separate religious and secular influences on the development of such systems; in most societies, religious and secular law were or are the same thing. An evolutionary psychology of morality and ethics in religion thus overlaps considerably with the psychology of culture more generally. Nevertheless, some aspects of morality and ethics are uniquely religious. For example, laws presumably carry extra force if they ostensibly have been dictated or sanctioned by supernatural beings, particularly if a deity is perceived as able to monitor people's behavior and to mete out rewards and punishments accordingly. In many cases, certain patterns of behaving (or not behaving) are prescribed by the deity as part of a tacit or explicit

social-exchange agreement with the deity. Research on evolved mechanisms pertaining to social exchange and cheater detection (e.g., Cosmides & Tooby, 1992) might therefore be useful in understanding beliefs about evil and sin.

Superficial variability notwithstanding, religious systems of morality and ethics tend to share certain universal features. One such feature is "in-group morality" which, as noted above, suggests the operation of coalitional-psychological mechanisms. In his analysis of the Old Testament, Hartung (1995) argues that the injunction to "love thy neighbor as thyself," as well as the Ten Commandments, were always intended to apply only to the Israelites and not to the heathens beyond. In fact, "genocide was as central a part to God's instructions as morality. . . . Like all good group-selectionists, the Jewish God was as severe towards the out-group as he was moral to the in-group" (Ridley, 1996, p. 192). Ridley goes on to note that such policies are by no means limited to Judaism; "murder" almost universally is defined only with respect to one's own tribe. Killing out-group members does not count as murder because out-group members are typically thought of as something less than human (which, in turn, reflects evolved mechanisms for thinking about "natural kinds").

Second, virtually all religious systems of morality and ethics regularly invoke the basic principle of reciprocity in social exchange. In religions from Christianity to Confucianism, it is virtuous to "do unto others as you would have them do unto you." Likewise, it is always evil to cheat on explicit or tacit social contracts—with other people and, especially, with God—by taking more than one deserves. The prescribed retribution for transgressions often takes the form of reciprocity as well—that is, "an eye for an eye." Cosmides' research on cheater-detection mechanisms and social exchange provides a clear psychological basis for explaining the universality of these concepts (Cosmides & Tooby, 1992). Moreover, an evolutionary analysis of shame and guilt (Frank, 1988) might provide useful insights into these emotions in the context of religion.

From an evolutionary point of view, it is not a coincidence that so many other details of religious ethical systems, like secular legal codes, concern matters of sex, marriage, and kinship. In many cases such laws are probably best understood in terms of how they serve the interests of those in power; often they involve conflicts between the interests of powerful individuals or institutions and our evolved tendencies toward nepotism. For example, a variety of authors suggest that proscriptions against incest

in both secular and religious law were created by the ruling elite as a means of preventing consolidation of resources within families (not to prevent brother-sister incest, to which we have an innate repulsion), and that the medieval church's rules on sex and marriage were also weapons against familial dynasties (Pinker, 1997).

Another common aspect of religious law is that of dietary restrictions and food taboos. Pinker (1997) suggests that such rules may be designed for the purpose of maintaining in-group/out-group boundaries by preventing disenfranchised group members from developing alliances with members of competing coalitions ("If I can't eat with you, I can't become your friend"; p. 385). Prohibited foods, he notes, typically are a favorite food of a neighboring tribe. Pinker also discusses a variety of ways in which food taboos "exploit the psychology of disgust"—the latter being an evolved mechanism with its own distinct evolutionary history and function.

Mystical Experience

One of the most intriguing religious phenomena is that of numinous, mystical, or religious experience (see Hood, Spilka, Hunsberger, & Gorsuch, 1996, for a review). From Otto's (1917/1958) classic description of the *mysterium fascinans* and *mysterium tremendum*, to Persinger's (1987) identification of a "God module" in the left temporal lobe, scholars have approached this topic from a diversity of perspectives. Although I do not have an explanation of the origin of such experiences to offer here, I wish to make several points.

First, the fact that several researchers have claimed to identify the neurophysiological substrate of mystical experiences (e.g., D'Aquili & Newberg, 1998; Persinger, 1987) should not be interpreted as evidence of a unitary psychological mechanism in EP terms. Neuroscience research shows that "relatively simple, mechanical functions" are physically localized in the brain, but complex "Functions" (with a capital "F"), which are performed by coordinating many simpler functions, are not: For example, "a Function such as reading is carried out by functions that detect lines, organize them into patterns, match them to patterns stored in memory, and so forth" (Kosslyn & Koenig, 1995, pp. 11–12). Mystical experiences probably involve the activation of brain regions associated with some elementary "function" that is ordinarily recruited by other, more complex Functions. Hints about what these might be are suggested

by other kinds of more mundane emotional experiences to which religious experiences have often been compared, such as awe, wonder, aesthetic experiences, creativity and other forms of "peak" experiences.

Second, as I have argued throughout this article, we should avoid jumping to the conclusion that the mechanism(s) underlying such experiences necessarily represent(s) an adaptation evolved for this purpose— as do Ramachandran, Hirstein, Armel, Tecoma, and Iragui (1997). Identification of the neurological basis for such experiences does not alter the arguments presented earlier in support of this stance. Rather, I suspect that such experiences, like the other religious phenomena discussed in this article, are byproducts of one or more mechanisms designed for other purposes.

Third, many brain systems and psychological mechanisms are prone to misfiring, overactivation, or inappropriate activation by certain kinds of stimulation or drugs. Averill (1998, p. 117) notes several parallels between the phenomenology of anxiety attacks and of mystical experiences, including the sense of being overwhelmed or engulfed by the feeling, ineffability, and "an actual or impending dissolution of the self-as-object." Anxiety attacks (presumably) are not an adaptation, but rather reflect a misfiring or inappropriate activation of emotion mechanisms that ordinarily are adaptive. I suspect that mystical experiences eventually will be understood in a similar manner, and that EP will be useful in identifying the particular mechanisms involved.

Existential Questions and Death

The search for answers to existential questions about life, death, and other ultimate concerns has often been cited as the basis for, if not the definition of, religion (e.g., Batson, Schoenrade, & Ventis, 1993; Tillich, 1951). In some respects, such heady issues are the most difficult for an evolutionary approach to deal with: It is, after all, a long way from genes to existentialism. Nevertheless, the evolutionary perspective may provide a useful perspective on such issues in several ways.

First, this approach offers an insight into why such deep, philosophical problems are so difficult to resolve in the first place: We simply may not possess the requisite cognitive machinery to solve them. Pinker (1997) likens the situation to rats trying to learn prime numbers, and our own inability to see ultraviolet light or mentally rotate objects in four dimensions. Even well-educated people are quite poor at symbolic logic unless

the problem context effectively activates a domain-specific mechanism (Cosmides & Tooby, 1992).

Perhaps the existential questions most commonly associated with religion are those concerning death. Many theorists have speculated that fear of death is a principal driving force behind religion and much other human behavior (e.g., Becker, 1973; Greenberg, Pyszczynski, & Solomon, 1986). Although explaining fear of death might appear to be the simplest of tasks for EP, it ironically might be among the most difficult. The logic of domain-specificity mitigates against a broad "survival instinct" or general desire to avoid death, just as no computer chess program contains the instruction "make good moves" (Buss, 1990); such an instruction is simply too vague to be of any practical value in guiding behavior. We instead possess a host of specific mechanisms designed to solve myriad specific adaptive problems which, given proper functioning and a modicum of good luck, predictably result in avoiding death (at least long enough to reproduce and raise successful offspring).

Why, then, is the mystery and fear of death so profound that humans universally invent belief systems to address it? Wenegrat (1990) suggests that death-anxiety largely reflects separation anxiety, that is, fear of losing one's attachment relationships. Other possibilities might include fear that one will no longer be able be available to invest in children, grandchildren, or other kin, or that one will fail to complete other kinds of unfinished business such as payment of debts (i.e., cheat on social contracts), not to mention a generally adaptive fear of the unknown. Whatever the motivation, the psychological essentialism inherent in our naive biology (Gelman et al., 1994) seems a likely basis for the universal belief that some kind of spirit or soul—the "essence" of a person—continues to exist beyond death.

Another category of deep questions for which people turn to religion for answers concerns about the ultimate meaning or purpose of one's existence. An understanding of people's reasoning about such questions may be analogous to asking a conscious chess program about its purpose in "life." It would not have any direct knowledge of the answer, because its "purpose" (winning chess games) is nowhere encoded directly into its programming. The kinds of inferences it might draw by reflecting on its own motives and behavior, however, might well reflect details of its design: It might infer, for example, that its "purpose" is to capture enemy pieces or to create open diagonals for its bishops. Our own attempts to struggle with these questions might similarly reveal aspects of our

programming, as when we reach the decision that what really matters in life is family (i.e., investment in kin) or love relationships (pair bonding, reproduction).

On the other hand, if we really are akin to rats pondering prime numbers, there is another sense in which there is no telling what kinds of solutions we might produce. Given an enormous number of domain-specific psychological mechanisms at our disposal, combined with our remarkable creative abilities, and combined further with our ability to draw upon the products of other people's minds via language and culture, it would be foolish to think that theology, spirituality, or religion can be fully explained by EP or any other social science. EP is useful in understanding what motivates scientists, as well as the cognitive processes recruited in scientific thinking, but it seems doubtful that is will ever explain how we arrived at the Heisenberg principle or, for that matter, the theory of evolution by natural selection. I do believe, however, that EP will take us further, faster, than the available alternatives.

Implications for Research in Psychology of Religion

From the evolutionary-psychological perspective, different aspects of religion, for different people at different times, involve the activation and operation of distinct evolved psychological mechanisms such as those reviewed in the preceding section. Consequently, a principal task for psychology of religion is to identify the particular mechanism(s) involved in the particular research context of interest, and then bring to bear on the problem knowledge about the functioning of that particular mechanism. In this section I briefly sketch some ways in which this approach might be applied in reconceptualizing previous research and theory on religion and guiding future research.

A common misconception about evolutionary psychology is that it lacks empirical testability. We obviously cannot go back in time to observe the evolution of human psychological mechanisms or the appearance of the first religious ideas. However, theories about psychological mechanisms have empirically testable consequences that can be examined using standard methods of psychological (and other social-science) research. If anything, the evolutionary approach opens the door to more, rather than fewer, methodologies for testing psychological hypotheses derived from evolutionary thinking: EP is an inherently interdisciplinary

enterprise that relies on empirical data from sociology, anthropology, neuroscience, primatology, ethology, and numerous other fields in addition to psychology (Tooby & Cosmides, 1992).

Buss (1995; also Ketelaar & Ellis, in press) provides a cogent discussion of the empirical-testing issue based on the hierarchical nature of evolutionary theorizing: The theory of natural selection (i.e., inclusive fitness) provides the basis from which mid-level theories concerning specific domains are derived, from which, in turn, specific hypotheses about observable implications are derived and then tested. For example, based on the theory of reciprocal altruism, Cosmides and Tooby (1992) hypothesized the existence of a dedicated mechanism for detecting violations of social-exchange contracts, a hypothesis that has been supported by numerous experiments. Similarly, researchers have derived from parental investment theory numerous hypotheses about sex differences in mate preferences, which have been confirmed repeatedly in studies using standard survey methods (Buss, 1992). See Ketelaar and Ellis (in press) for a thorough discussion and defense of evolutionary psychology in the context of modern philosophy of science.

Situational and Individual-Differences Factors

Social-psychological approaches to religion focus on *situational* factors that increase, decrease, or qualitatively change religiousness. Once the specific psychological mechanisms involved are identified, hypotheses can be generated about the environmental conditions that are likely to activate them and to generate particular patterns of behavior. For example, the attachment system is designed such that perceived danger and stress activate efforts to restore proximity to an attachment figure. To the extent that the attachment mechanism underlies a person's religious beliefs, then, prayer and other attempts to become close to God would be expected to increase in times of perceived danger. To the extent that one's religious beliefs are supported mainly by coalitional mechanisms, perceptions of increased strength of the religious out-group would be expected to result in increased cooperation with the in-group and rejection of the out-group.

Much work in psychology of religion has focused on *individual differences* in various aspects of religiosity and their correlates. An evolutionary perspective suggests at least two general sources of such individual differences (see Buss & Greiling, 1999, for a thorough

discussion of individual differences in EP). First, people differ with respect to the particular psychological mechanism(s) most prominently supporting their religious beliefs at a given point in time; for example, some people's images of God are organized primarily by attachment thinking, whereas others' images are organized more strongly in terms of power/status thinking. Individual differences with respect to *loving God* and *controlling God* dimensions (Benson & Spilka, 1973) might be used to study differential operation of these two distinct mechanisms. Similarly, individual differences in fundamentalism may reflect the varying degrees to which people's religiosity is driven by coalitional mechanisms, consistent with previous theorists' conceptualization of this dimension of religion in terms of "boundary maintenance" (e.g., Ethridge & Feagin, 1979). This coalitional-psychology perspective may also be useful in understanding why fundamentalism, more than other dimensions of religiosity, is correlated with right-wing authoritarianism and prejudice (Hunsberger, 1995).

Second, individual differences emerge from experience and learning in specific domains with respect to any particular mechanism. For example, individual differences in experience with attachment figures—particularly their perceived reliability and availability—have a variety of consequences for behavior in and attitudes toward subsequent relationships. Experience in insecure (interpersonal) attachment relationships is predictive of turning subsequently to God as a substitute attachment figure (Kirkpatrick, 1997, 1998).

Cross-cultural differences. Although humans everywhere share the same collection of mechanisms ("human nature"), the degree and frequency with which a given mechanism is activated varies as a function of ecological factors—just as callus incidence varies across cultures depending on the number of people who walk barefoot or play guitars. Individuals and cultures facing different ecological conditions might therefore be expected to differ on average in their religious beliefs and the psychological mechanisms activated by them.

For example, Hartung (1995) suggests that the "evolution of in-group morality" is common in major religions because the cultures within which major religions were developed were rife with intergroup conflict; he cites the origins of Judaism as a prototypical example. Badcock (1986, p. 151) suggests that the "altruistic commitment to the welfare of the social whole" promoted by Christianity owes to its roots in urban centers

and among disadvantaged social groups—that is, among people who would most benefit from this ethic. Research by Rohner (1975) and Lambert, Triandis, and Wolf (1959) suggests that parenting practices, which themselves are related to ecological conditions such as resource distribution and availability, are correlated cross-culturally with perceptions of benevolence/malevolence of deities. Thus the evolutionary model offers a framework for conceptualizing, and generating empirically testable hypotheses about differences between religious belief systems and denominations.

Sex differences.   The psychological mechanisms most actively involved in religious thinking might also be expected to differ systematically as a function of other individual-difference factors, including sex. That women are generally more religious than men has become something of a truism within the psychology of religion (e.g., Argyle & Beit-Hallahmi, 1975). This conclusion, however, is based on data from mainly Christian samples in the modern industrialized West, and it not at all clear how far it can be meaningfully generalized. In tribal societies, for example, religion is so closely intertwined with other aspects of culture as to render the idea absurd: One might as well suggest that, for example, female Yanomamo are "less Yanomamo" than are men.

Instead, a more fruitful approach would be to focus on differences in the *ways* in which men and women are religious. Psychological mechanisms are sexually differentiated to the extent that the adaptive problems they are designed to solve differ for males and females; this is particularly true in areas surrounding mating and reproduction (e.g., sexual strategies and competition for mates; see Buss, 1992, for a review). To the extent that sexually differentiated mechanisms are involved in religious thinking, we would expect to find that "a woman's religious experience and what she holds religiously most important are qualitatively different from men's religious experience and focus" (McGuire, 1981, p. 97).

Studies of sex differences in God images offer some support for this suggestion. Cox (1967) found that boys were more likely to view God as a supreme power, forceful planner, and controller, whereas girls tended to depict God more as loving, comforting, and forgiving. Similar results were reported by Nelsen, Cheek, and Au (1985) in an adult sample. In general, the idea that men may process religious ideas in terms of power, status, and prestige considerations to a greater extent than do women

suggests a variety of testable hypotheses for future research on sex differences in religious belief and experience.

CONCLUSION

Although this brief article has barely sketched the outline of a modern evolutionary psychological approach to religion, I hope it will suffice to illustrate the potential value of this approach with respect to several general issues. First, it provides a coherent way of thinking about how religion could be both a species universal—our species as *homo religiosus*—yet at the same time can accommodate the tremendous individual and cultural variability in religious belief and behavior. Second, it provides a framework for asking the deep, difficult questions about religion—that is, *why* religion is universal, and *why* it takes the particular forms that it does and not others. Third, it provides a metatheoretical framework for integrating the many and varied perspectives on religion offered by various social science disciplines, as well as by psychology's own subdisciplines.

Evolutionary psychology holds considerable promise as a future metatheoretical framework for the study of personality, for psychology generally, and indeed for all the social sciences (Buss, 1995; Tooby & Cosmides, 1992). As such, it offers an integrative paradigm for the psychology of religion as well. Although it is difficult to predict how long it will be before the evolutionary paradigm is fully embraced by social scientists, I believe it is a matter of "when," not "if." The psychology of religion might just as well get a head start.

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