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Abstract and Keywords

This chapter draws on one of the new cognitive and evolutionary psychological theories of religion, religious attachment theory, to explain the emergence of the Axial Age religions of the late first millennium bce. These religions—Judaism, Christianity, Hinduism, Buddhism, Confucianism, and Daoism—introduced new kinds of gods into world history—gods that were transcendent and capable of providing release from suffering. Religious attachment theory views religion as providing "substitute attachment figures" under circumstances in which people's social attachments have been severely disrupted. The basic argument of the chapter is that the new Axial Age gods were responses to heightened levels of anxiety and ontological insecurity that accompanied massive increases in warfare and urbanization in the period between approximately 600 bce and 1 ce. The anthropomorphic pagan gods of the ancient empires had become inadequate in the face of the new religious needs that people began to experience, and thus they came to be replaced.

Keywords: paganism, Axial Age, transcendence, salvation, cognitive theory, adaptationist theory, attachment theory, existential anxiety, warfare, urbanization

DURING the past 10,000 years, there has been striking parallel social evolution all over the globe. Societies have grown larger, adopted more advanced technologies, become more status differentiated and stratified by wealth, and developed more complex political systems marked by the increasing concentration of power at the top of the political hierarchy. This remarkable parallel evolution has by now become well known to anthropologists (Sanderson, 1999, 2007; Carneiro, 2003).

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But one of the most important dimensions of social life, religion, has received limited attention in terms of its long-term evolution.[1] This chapter seeks to redress this problem. The simplest societies, primarily hunter–gatherer bands, have mostly had religions in which shamans were the principal type of religious specialist. Later religious evolution produced communal rites performed by the whole society or by significant segments of it. By approximately 5,000 years ago, the pagan religions of antiquity, with their pantheons of anthropomorphic gods and priestly classes, arose and dominated state-level societies for several thousand years. Then there was a shift to the religions familiar to us today— the world religions that are still the dominant type of religion on earth. They all emerged in a strikingly short period on a prehistoric timescale, the period between approximately 600 BCE and 1 CE, usually known as the Axial Age. Transcendent gods replaced the earlier anthropomorphic gods, and people looked to these new gods for salvation, which is to say release from earthly suffering. In some cases, there was a single god that emerged, One True God. In other cases, there was no single God, although one god was more important than the rest. Here again, we seem to have another case of long-term parallel evolution.

(p. 590) The religious shift during the Axial Age constituted the most dramatic and important religious transformation in world history (Jaspers, 1953, 1962; Eisenstadt, 1986a, 1986b). This chapter seeks to understand this momentous transformation by drawing on ideas developed by cognitive and evolutionary psychologists. After discussing the leading arguments of these perspectives, I make use of one specific theory, so-called religious attachment theory, to make sense of the Axial Age transformations. The central argument is that there were major social, economic, and political upheavals during the period of the Axial Age that led to severe disruptions in people's sense of safety and well-being, and that it was people's resulting existential anxiety and insecurity that led to the social construction of a radically new kind of god and altered forms of interaction between humans and this type of god.

Pagan Predecessors

In complex chiefdoms and ancient states, pagan religions predominated.[2] Some of the best known pagan religions were those of the ancient Sumerians and Egyptians; the ancient Greeks and Romans; the Aryans of South Asia; and the Maya, Aztecs, and Incas of the New World. Pagan religions have polytheistic pantheons of specialized gods who are highly anthropomorphic. Like humans, pagan gods are finite and mortal. Some are considered good, others evil; some are highly competent at what they do, whereas others are regarded as incompetent fools; they usually eat and drink and often have great banquets; many of them like sex and have frequent orgies; they also fight and go to war. Each god is usually responsible for a specific sphere of life, such as love, war, the weather, or agriculture. Some of the gods take an interest in human affairs in a positive way, but many are threatening to humans and often try to deceive and trick them.

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Yehezkel Kaufmann (1960) contends that the most important feature of pagan religions is not their anthropomorphic gods but, rather, that these gods are derived from a preexisting order. They do not exist outside the universe and thus are not the source of everything that exists. They are the product of whatever existed in some primordial realm before they came into being. This primordial realm is often considered to be chaos or certain types of waters.

Pagan religions also have classes of priests, some part-time and some full-time, who preside over and direct religious rituals of numerous types. These priests in many cases are quite different from the later priests of the world religions. For example, Sumerian priests were more like soothsayers, healers, and sorcerers than like the priests of later religions (Woolley, 1965). Priests in Roman society were also more like Sumerian priests than the priests of the world religions.

Another universal trait of pagan religions is their emphasis on animal (and sometimes human) sacrifice. Because the gods are like humans, they need to be fed, and thus are regularly offered food, especially meat. In Arabia and much of North Africa, for example, camels were commonly sacrificed; bulls were important objects of sacrifice (p. 591) throughout the Mediterranean world, and pastoralists in Central Asia were noted for sacrificing horses (Harris, 1977).

The Axial Age

The term *Axial Age* was coined by the philosopher Karl Jaspers (1953, 1962), who dated it from approximately 800 to approximately 200 BCE.[3] Jaspers called it "axial" because he viewed it as an "axis" of world history, a period during which fundamentally new ways of philosophical and religious thinking emerged in remarkably parallel fashion throughout much of the Old World. Among the individuals responsible for the new thinking, Jaspers specifically mentioned Confucius and Laozi in China; the Buddha in India; Zarathustra in Iran; the Hebrew prophets Elijah, Isaiah, and Jeremiah; and the Greek philosophers. Jesus and Christianity were viewed as a "late product" of this age.

For Jaspers, the Axial Age was in essence a revolution in consciousness in which "consciousness became conscious of itself" and in which humans began "thinking about thinking." Pre-Axial cultures were bogged down in mythical thinking and were "unawakened." This basic idea has been extended by later scholars, especially S. N. Eisenstadt (1986a, 1986b). For Eisenstadt, the Axial Age amounted to a great "breakthrough" involving the creation of a transcendental, supra-mundane, and higher metaphysical and moral order. In the pre-Axial civilizations, the religious world was structured in a way very similar to the mundane, everyday world. Eric Weil (1975) echoes this idea, suggesting that the pre-Axial civilizations were not on the way to anything new and were, in that sense, anti-historical. The Babylonians, for example, were caught up in

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a blind sense of fatality. The Egyptians were more optimistic, but they too failed to produce anything new.

The Axial Age is often over-intellectualized—viewed as largely the product of religious wisdom offered by sages—and as a result what was happening among the masses has often been given short shrift. In Robert Bellah's (2011) book on religious evolution, for example, the Axial Age is interpreted as a product of great intellectuals and the masses are nowhere to be found. The same kind of emphasis is found in Eisenstadt's writings on the Axial Age. In reality, the Axial Age was a two-part process: Ideas were proposed by sages or prophets, and some of them caught on and spread. To understand the Axial Age, we need to understand why the new religious ideas came to have such enormous appeal to very large numbers of people.

The main Axial Age religions were Judaism, Christianity, Hinduism, Buddhism, Confucianism, and Daoism. The most important characteristics of these religions are shown in Table 27.1. Two characteristics appear most crucial, the first being the *transcendent character of the supernatural*. The world religions had a completely new conception of the supernatural. Gone were the anthropomorphic gods of the pagan religions, who were replaced by a god or gods conceived as *transcendent*. What is implied by the notion of transcendence is basically a god who was little, if anything, like humans and who, although (p. 593) (p. 592) (p. 594) creating the world, stood outside it. A transcendent god does not eat, have sex, marry, go to war, or have foibles and weaknesses. He is the "uncaused cause" and the "unmoved mover." As noted previously, whereas in the pagan religions the gods are derived from a preexisting order, a transcendent god is by definition "underived" (Kaufmann, 1960). All of the world religions had a transcendent supreme deity, whether in the form of a personal god or an abstract essence, and whether or not there were other gods that were also worshiped. Because world transcendence is common to all the world religions, and strict monotheism only to the Near Eastern religions, it seems more appropriate to call the Axial Age religions *world transcendent* rather than monotheistic religions.[4]

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Table 27.1 Predominant Features of the Axial Age Religions[a]						
Feature	**Judaism**	**Christianity**	**Hinduism**	**Buddhism**	**Confucianism**	**Daoism**
Date and place of origin	In Palestine about 1300 BCE in original polytheistic form; shift to monotheism around 600 BCE	Shortly after 1 CE in Eastern Mediterranean	Earliest form (the Vedas) about 1500 BCE in North India, but classical version 500 BCE to CE 1	Late sixth century BCE in North India	Sixth century BCE in China	Sixth century BCE in China
Founders/ prophets	Biblical version: early Hebrew prophets (e.g., Moses, Abraham, Isaac); revisionist version: later prophets and kings (e.g., Hosea,	Jesus Christ (as interpreted by Paul of Tarsus and the authors of the Gospels)	No known founder	Siddhartha Gautama (the Buddha)	Confucius	Laozi

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	Hezekiah, Josiah)					
Development and spread	Throughout Palestine after 600 BCE, with diaspora communities throughout eastern Mediterranean; limited spread and geographical range	Spread slowly but then more rapidly through cities of Roman Empire; adopted and promoted by Constantine around 312 CE	Spread throughout India in first few centuries bce, eventually displacing Buddhism as principal Indian religion	Spread throughout India in early centuries BCE, but then died out in India in favor of Hinduism around 1200 CE; spread to China and Southeast Asia in early first millennium ce	Spread throughout China to become its principal religion, although folk religions remained important (often more important); linked closely to Chinese state	Replaced Confucianism during Han period and became main popular faith along with Chinese folk religions; underwent decline in seventh century CE
Conception of supernatural	Transcendent God (Yahweh) as One True God	Transcendent One True God; Jesus Christ as Son of God and personal savior, but equal with God the Father and unified with Him and	Powerful High God Vishnu–Shiva, conceived either as two gods or two dimensions of a single God; many other	Original Buddhist doctrine atheistic, but eventual deification of the Buddha; Mahayana Buddhism	Traditionally understood to have no concept of supernatural agents; largely a secular philosophy rather than a	The Dao eventually evolved into a personal God in the form of Laozi; he assumed an incarnate form and descended

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		the Holy Spirit (doctrine of the Trinity)	minor deities worshiped in local and regional traditions	believed in bodhisattvas who delay their achievement of nirvana and descend to earth to help others attain salvation	religion; but some contend that it did emphasize dependence on a supreme power, and Confucius himself deified and people pray to him at temples	to earth as a savior; but not monotheistic; contained a complex pantheon of gods
Salvation doctrines	Elimination of wickedness from the world, restoration of Israel to its rightful place among nations, and resurrection of the righteous dead	Forgiveness of sins and entry into an eternal afterlife in a heavenly paradise	Release from earthly suffering and endless cycle of rebirths; attainment of nirvana; no heaven or paradise	For elite Buddhists, release from earthly suffering and endless cycle of rebirths; attainment of nirvana; Buddhist masses did not seek nirvana but salvation in	None; doctrines emphasizing right living and good government	For elite Daoists, achievement of ecstasy and becoming one with the Dao; for ordinary Daoists, avoidance of death and eternity of the body; those who avoid death go

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				a paradise by a loving god		straight to paradise
Means of achieving salvation	Adherence to the Law (e.g., dietary rules, circumcision, rest on the Sabbath)	Belief in Christ as personal savior; repentance of sin, etc.	Rejection of material world through ascetic discipline and mystical contemplation; performance of obligations and devotion to a personal god	Rejection of material world through ascetic discipline and mystical contemplation; following eightfold path	No concept of salvation, but five principles of correct behavior	Elite Daoists entered trances to achieve ecstasy; masses used various techniques to achieve salvation and immortality; avoid sin (or repent)
Imagistic depictions of God	God is beyond human comprehension and therefore incapable of depiction	God is beyond human comprehension and therefore incapable of depiction (Jesus as Son of God can be depicted)	Elaborate	Elaborate	Yes	Yes

(*a*) Descriptions refer to the nature of these religions at their time of origin and in ensuing centuries. They do not necessarily apply in all respects to contemporary versions.

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The second crucial characteristic is an *emphasis on salvation from this world and on God's love and mercy*. It was Weber (1978) more than anyone who emphasized that the major world religions were salvation religions. Salvation could take a variety of forms but most often involved a desire for *release from earthly suffering*. That this was something new has also been recognized by McNeill, who points out that earlier religions

> viewed the afterworld as essentially a continuation of life as lived on earth, perhaps with some inescapable diminution of its fullness. The new religions of salvation, on the contrary, held that life beyond the grave involved radical change and improvement in society, so that only purged and purified spirits could share in life eternal. (1963:338n)

Although earlier types of religion conceived of an afterlife that the spirit entered upon death—that is, they postulated a concept of *soul*—the soul was not something that had to be "saved" from anything. Similarly, numerous scholars have suggested that the world religions were religions of love and mercy (Jaspers, 1962; Harris, 1977; Stark, 1996). This is closely related to the dimension of salvation in that it is a worldly form of release from suffering. We find this especially evident in Christianity, in which God's love provides comfort and a sense of peace.

Because of this emphasis on salvation, the world religions can also be called *world salvation* religions. But what is it that people wanted to be saved *from*, and why was an emphasis on love and mercy such a critical feature of these religions? What was happening during the second half of the first millennium BCE that would have led to the emergence of the Axial Age religions? These are the critical questions to be addressed in this chapter.

The New Cognitive and Evolutionary Psychological Theories of Religion

Some of the most recent and interesting theoretical work on religion has come from scholars using ideas from cognitive and evolutionary psychology. Here, I begin by discussing the work influenced primarily by cognitive psychology, after which I turn to the evolutionary dimensions of this approach.

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(p. 595) Cognitive By-Product Theory

Cognitive by-product theorists stress that religious beliefs are products of how the brain works. Religious beliefs must be *counterintuitive* beliefs, or beliefs that are contradicted by the information that people acquire through their ordinary experience of reality (Boyer, 2001; Atran, 2002; Pyysiäinen, 2003, 2009; Barrett, 2004). Counterintuitive beliefs violate our natural intuitions with respect to folk biology, folk physics, and folk psychology. A being who requires no food to live, who is born in some exceptional way, or who does not age or die violates our biological expectations. Beings who are invisible or who can walk on water violate intuitive physics. And a being who knows everything and can read minds violates folk psychology (Boyer, 1994, 2000; Barrett, 2000; Pyysiäinen, 2009).

Pascal Boyer (2001) argues that supernatural entities are for the most part structured by our natural intuitions concerning *agency*. Humans have cognitive adaptations for agency in the sense that they recognize that persons and animals have goals and pursue various means to reach them. They cause things to happen. However, humans have a very strong tendency to extend their natural intuitions about agency beyond persons and animals to many features of nature, such as the sun, moon, or wind. They have a bias to assume that if the wind blows, it is because there is some agent that is causing it to blow, and to blow for some reason or purpose.

Like Boyer, Scott Atran (2002) argues that religious beliefs emerge from agent-based interpretations of complex events. Human brains appear to be programmed to search for agents as the causes of complex and uncertain happenings. The agent-detection schema or module of the brain is built for detecting predators, prey, and protectors. The brain is "trip-wired" to spot lurkers and seek protectors everywhere. In social interaction, people manipulate this hypersensitive cognitive aptitude so as to create the agents who order and unite the culture and the cosmos. People in all religions believe that the world has been deliberately created by unseen agents, that humans have souls that live on after their bodies die, and that through rituals they can persuade gods or spirits to change the world for human betterment.

The cognitive theorists assume that the architecture of the brain imposes strong constraints on the kinds of counterintuitive ideas and thus the kinds of supernatural agents that can be imagined (Boyer, 1994, 2001). Certain kinds of religious concepts exist rather than others because they are "attention grabbing." They resonate with people and are relatively easy to transmit to others. Religious concepts are counterintuitive, but there are limits to how counterintuitive they can be. An omniscient and omnipotent god that exists only on Wednesdays or that forgets everything instantly or spirits that punish you if you follow their commands are so implausible that they would fail to get traction anywhere (Boyer, 2001). And religious concepts cannot be relevant to just anything but, rather, must activate inference systems for agency, predation, death, morality, and social exchange (Boyer, 2001). Thus, cartoon characters such as Mickey Mouse, although

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certainly counterintuitive, cannot be supernatural entities because they have no relevance for these things. The same is true of supernatural beings such as Santa Claus (Barrett, 2008).

(p. 596) Another major dimension of the cognitive by-product theories concerns the evolutionary status of religious cognitions. Cognitive theories of religion are evolutionary theories, but there are two main types of evolutionary theories—so-called by-product theories and adaptationist theories. *Adaptationist* theories assume that anatomical structures or behavioral traits were directly selected for in evolution because they promoted survival and reproductive success. Such theories are the most common type of evolutionary theory generally speaking. But it is *by-product* theories that have come to be dominant in the cognitive and evolutionary study of religion. In contrast to adaptationist theories, by-product theories of religion assume that its elements are secondary side effects of other cognitive structures. A by-product is just along for the ride; it emerges from something that was selected for, but it is not itself an adaptation. The cognitive psychological theories are by-product theories. They assume that in the evolution of the human brain, there was no specific evolutionary selection for religious concepts—that is, there is no special religious center in the brain. Religious concepts have piggybacked on the extremely adaptive cognitive structures that are involved in agency detection (Boyer, 2001). At the risk of oversimplification, religion is in essence some sort of "gigantic mental accident" (Norenzayan, 2013).

The cognitive by-product approach can tell us why some kinds of religious beliefs are too implausible to exist anywhere, and yet there are several problems, two of which are especially noteworthy. One is cognitive theory's rather impoverished concept of causation. Boyer says that religious "concepts are not around because they are good for people or for society or because of an inherent need or desire to have them. They are around because they are more likely to be acquired than other variants" (2000:211). Such a position might be called "possibilism": If something is possible, it will happen in one way or another or at some time or another. Religion exists simply because it is possible for it to exist. The cognitive analysis of religion is not interested, Boyer says, in the question of whether religious concepts form a coherent whole or represent or explain the world. He deems such questions irrelevant in any cognitive analysis. A reasonable conclusion would seem to be that although a useful starting point, the cognitive approach does not appear to be a very ambitious undertaking. By itself, it seems unable to answer questions that seem most central to the majority of students of religion.

The second problem, closely related to the first, is the cognitive approach's apparent lack of interest in the causal significance of socioecological context. Boyer (1994) states that he is interested only in the cognitive constraints acting on the acquisition and transmission of religious concepts and that ecological and economic conditions do not interest him. These are to be treated merely as contingent background factors. The cognitive theorists are entitled to delimit their subject matter in this way (although see previous discussion), but Boyer makes a more problematic statement: "There is no indication, however, that changes in the way subsistence and exchange are organized

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could be correlated to [*sic*] changes in, for example, the recurrent connections between religious and intuitive ontologies" (1994:295). If he means that religious concepts and practices are unrelated to the economic and ecological differences among societies, this is simply wrong (see, for example, Sanderson and Roberts, 2008). In any event, the question of the (p. 597) relationship between religious concepts and practices and "contingent background conditions" is crucial if one wants a good general theory of religious variation and religious evolution. This leads us to consider adaptationist theories.

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Evolutionary Adaptationists

Adaptationist theories of religion assume that religious beliefs and rituals are evolutionary adaptations that evolved because of the benefits they provide in terms of survival and reproductive success. An adaptationist argument focusing mainly on religious ritual has been developed by Richard Sosis and Candace Alcorta (Sosis, 2003; Alcorta and Sosis, 2005). Following up on William Irons's (2001) suggestion that religious rituals are "hard-to-fake" indicators of commitment, Sosis and Alcorta use *costly signaling theory* to explain why religious rituals are so important in all religions. The Israeli evolutionary biologists Amotz and Avishag Zahavi (1997) have added a new wrinkle to Darwinian evolutionary theory, the notion of a *costly* or *honest signal*. Animals communicate information to others about their fitness by means of certain signals. But not just any signal will do, because signals can be faked. Therefore, a good signal of fitness is one that is difficult to fake and thus honest, and an honest signal is one that will impose some cost on the signaler. For example, peacocks fan out their beautiful and elaborate tails and strut in front of peahens in order to show them off. In their displays, peacocks are showing off their tails—signaling—in order to attract mates. These ritual displays are honest signals because it takes a large amount of energy to grow a beautiful tail, and thus the peacocks with the most beautiful tails will be the fittest (have the best genes). The cost to the peacocks takes the form of their tails' handicaps. The best tails are heavy, and heavy tails make it more difficult for peacocks to escape predators. Beautifully colored tails are also highly visible to predators.

So what is the connection to religious rituals? Sosis and Alcorta argue that human religious rituals are forms of costly signaling. This is especially true in religions whose ritual demands are very great. Consider, for example, the demands placed upon the Hutterites, a communal religious sect in western Canada (Sosis, 2003). Hutterites are expected to devote themselves to daily church worship, communal meals three times a day that are preceded and followed by prayer, and frequent fasting. There are also many restrictions on their behavior. They are prohibited from owning or playing musical instruments, wearing jewelry, smoking tobacco, dancing, and gambling. Adhering to these demands is therefore costly, and therein lies the key, Sosis claims. Following costly demands communicates to others that one is highly committed to the group. Continued participation in costly rituals actually serves to create or intensify religious belief. At the same time, strong believers come to evaluate ritual performances as less costly than do those whose beliefs are weaker. For strong believers, ritual performance is viewed as less of a burden, and, moreover, the opportunity costs of engaging in other behaviors are lower. Such believers therefore receive a large payoff in religious group membership, whereas those who cannot muster a sufficient level of belief and commitment tend to (p. 598) drop out. Thus, in enhancing belief and commitment, costly, hard-to-fake signals contribute to interpersonal trust and social cohesion.

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Sosis and Alcorta conclude that the main evolutionary function of religion is to promote group cooperation. Although this appears to be very similar to Durkheim's classic social cohesion argument, there is an important difference. Even though religion tends to promote social cohesion, belonging to a group with highly committed members also confers individual benefits. Other group members can be trusted and can be counted on to provide aid and assistance when it is needed. Because the costs of commitment are so great, highly committed members are also unlikely to be "free-riders," or individuals who reap the benefits of membership while giving back little or nothing in return. Sosis and Alcorta also acknowledge that religion has other individual benefits, such as the reduction of individual anxiety and the promotion of health.

Alcorta and Sosis contend that religious beliefs seem to go well beyond cognitive modules for agency detection. The core aspect of the authors' adaptationism is ontogenetic. They contend that there is an innate predisposition to believe in supernatural agents that is rooted in the neural architecture of the brain, especially in the prefrontal cortex, the temporal lobes, and the limbic areas. This predisposition is activated during childhood and adolescence, and thus there is a "developmentally sensitive window" for learning supernatural concepts. The authors refer to cross-cultural research suggesting that children between the ages of 3 and 12 years have a sort of "natural theism." They go on to state,

> This developmental predisposition to believe in socially omniscient and declarative supernatural agents contrasts with evolved mental modules of folk-psychology for natural categories. It also goes far beyond natural agency-detection modules to encompass socially strategic agents with behaviorally motivating characteristics. . . . If religious beliefs are merely by-products of mental modules evolved to deal with the "natural world," *why do such beliefs consistently violate the basic cognitive schema from which they are presumed to derive*? (2005:327, emphasis added)

Joseph Bulbulia (2005) agrees with the adaptationist position of Alcorta and Sosis, but he gives more emphasis to the contribution of religious commitments to physical and psychological well-being. Religion, he argues, is important in helping people cope with what he calls a "traumatic world": In all societies, people are subject to disease and disability and poor reproductive prospects. People experience grief, anxiety, and fear, which create stresses that often lead to poor physical and mental health. Religion helps shield people from the "slings and arrows of existence . . . by altering damaging assessments of the world" (2005:89). "Supernaturalisms," he says, "seem to help us to endure the foxholes of life" (2005:89).

Andrew Newberg and Eugene d'Aquili are neuroscientists with a special interest in human mystical states and their sources in the brain (d'Aquili and Newberg, 1999; Newberg, d'Aquili, and Rause, 2001). The authors also note that humans are myth-making creatures, and to understand the neurological foundations of religion, we need an understanding of myth. The mind has "cognitive operators" that work to reduce (p. 599)

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intolerable anxiety and help us make sense of the world. People have existential worries: Why do we die and what happens after we die? How do we fit into the universe? Why is there suffering in the world? What is the origin of the universe and of humans? Newberg et al. note that

> in every human culture, across the span of time, the same mythological motifs are constantly repeated: virgin births, world-cleansing floods, lands of the dead, expulsions from paradise, men swallowed down the bellies of whales and serpents, dead and resurrected heroes, the primeval theft of fire from the gods. (2001:74)

Newberg and d'Aquili contend that these myth-making and religious tendencies evolved because of their adaptive value in promoting survival and well-being. The power of religion is that it alleviates "existential stress"; it decreases anxiety and uncertainty and gives people a greater sense of control in a terrifying world.

Erica Harris and Patrick McNamara (2008) are adaptationists in this sense. They identify three criteria whereby a trait can be considered to be an adaptation: It is a cultural universal, is acquired effortlessly, and has an "associated biology" (i.e., a known set of genetic, anatomical, or physiological systems). They note that the first two criteria are easily met. Religion has been found everywhere at all times, and children acquire religious beliefs with extraordinary ease (Barrett, 2012). The third criterion is more difficult to meet, but Harris and McNamara point to research showing that religiosity appears to be moderately to highly heritable (they suggest a heritability coefficient of .28 to .72)[5]; to neuroimaging studies indicating that parts of the brain high in the frequency of dopamine receptors, especially the prefrontal cortex, seem to be associated with religious experience; and to pharmacological studies showing that the *DRD4* gene correlates positively with different measures of religiosity.

To Harris and McNamara's (2008) points can be added that religion promotes both health and reproductive success. In an extremely comprehensive survey of studies on religiosity and physical and mental health (Koenig, McCullough, and Larson, 2001), it was shown that the majority of studies found better physical health and greater longevity among the more religious. Most studies focusing on mental health have reported the same findings. Indeed, religiosity seems to promote better physical health by also promoting better mental health. It decreases anxiety and uncertainty and gives people a greater sense of control in a difficult world (Koenig et al., 2001; Seybold, 2007). Regarding religiosity and reproductive success, people in better health are more likely to find mates, and good mates, than are people in poor health, and thus they are more likely to leave more offspring. Moreover, there is empirical research linking individual religiosity to higher fertility. Numerous studies conducted in a variety of countries show that women who express stronger religious beliefs and who practice their religion more frequently leave more offspring than do the less religious (Frejka and Westoff, 2006; Kaufmann, 2006; Blume, 2009).

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In conclusion, I take the adaptationist position that there really is some sort of "religion module"—a bundle of highly specialized neurons and neuronal connections built by a set of genes—in the brain. It may well be that religious beliefs and rituals originated (p. 600) as by-products of cognitive modules intended for some other purpose, but it is also likely that at some point they became decoupled from these modules and evolved their own independent structure—that is, they became adaptations.[6]

Religious Attachment Theory

One important theory developed within the new cognitive and evolutionary psychological framework is what can be called attachment theory, which has been developed by Lee Kirkpatrick (2005). Kirkpatrick is a vigorous defender of by-product theory, but I argue that his theory works better as an adaptationist theory. He would object, of course, but I will treat his theory as such.

Kirkpatrick roots his argument in John Bowlby's (1969) classic attachment theory. Bowlby contended that the human infant is primed to form a strong bond with its parents, its mother in particular, because parents were needed for nurturance and protection in an ancestral environment filled with a wide range of dangers. For Kirkpatrick, many religious notions are extensions or generalizations of the parent–child bond. Supernatural agents are viewed as protectors from harm in much the way that parents are viewed as protectors. God becomes a *haven of safety* and a *secure base*. Kirkpatrick points out that people in modern societies often turn to religion in times of psychological distress and crisis, such as personal catastrophes, serious illness or injury, and death and grieving. He notes that much of Christian scripture, for example, reveals the importance of God in providing "a shield" or "strength." He also reviews research showing that people who display strong attachments to God show better physical and mental health and report less loneliness and depression, fewer psychosomatic symptoms, and greater life satisfaction (cf. Sanderson, 2008).

Kirkpatrick stresses that God or gods are primarily *substitute attachment figures* for natural attachment figures—that is, for mothers, fathers, and other close kin. The feeling of a relationship with God or gods is most likely to be activated when an individual's sense of security, safety, and freedom from anxiety falls below a certain threshold as a result of natural attachments being inadequate to life's challenges. Thus, children who fail to develop adequate attachments to parents should be more likely than other children to develop an attachment to God. Kirkpatrick calls this the *compensation hypothesis*. This language is particularly revealing because it converges with some aspects of the comparative sociology of religion of Max Weber (1978), who argued that what disprivileged classes seek most from religion is some sort of compensation. Kirkpatrick points to research on religious converts (Ullman, 1982, 1989) showing that 80% of converts reported poor attachments to their fathers and 53% poor attachments to their

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mothers compared to, respectively, only 23% and 7% of a control group, as well as to other research supportive of the compensation hypothesis.

Some of the thinking of the sociological theorist Anthony Giddens (1990, 1991) converges with the attachment theory in that Giddens has argued that the need for *ontological security* is a fundamental human need. This involves a need to feel that one's life and (p. 601) the lives of kin are secure, safe, free from harm, stable, predictable, and so on. Giddens defines this concept as

> the confidence that most human beings have in the continuity of their self-identity and in the constancy of the surrounding social and material environments of action. A sense of the reliability of persons and things, so central to the notion of trust, is basic to feelings of ontological security. (1990:92)

In the human ancestral environment, the most important things that can diminish ontological security are danger from animal predators, natural forces, and manipulative and deceitful humans, and the types of religions found in this environment largely reflect these concerns. In more advanced societies, the sense of ontological security is most likely to be disrupted by rapid and massive social change, and in these societies we see very different kinds of religions that seem to reflect these new concerns. In such societies, the problems of cosmological order and meaning and the fear of death also seem to loom larger.

Giddens' notion of ontological security actually parallels even more closely the Bowlby/ Kirkpatrick notion of attachment. Giddens notes that the first context of trust is the kinship system, "which in most premodern settings provides a relatively stable mode of organizing 'bundles' of social relations across time and space" (1990:101). In fact, he has virtually independently rediscovered attachment theory, as is evident in the following passage:

> The trust which the child, in normal circumstances, vests in its caretakers, I want to argue, can be seen as a sort of *emotional inoculation* against existential anxieties—a protection against future threats and dangers which allows the individual to sustain hope and courage in the face of whatever debilitating circumstances she or he might later confront. (1991:39–40, emphasis added)

Giddens identifies two other types of social relations that contribute importantly to ontological security—the local community and religion. "Religious cosmologies," he says, "provide moral and practical interpretations of personal and social life, as well as of the natural world, which represent an environment of security for the believer" (1990:103).

Kirkpatrick's attachment theory and Giddens' notion of ontological security provide us with a critical component for understanding some of the features of religion, especially the evolution of the world salvation religions, to which I now apply it.

Applying Attachment Theory: War, Urbanization, and Ontological Insecurity in the Axial Age

My own theoretical interpretation of the transition to the world transcendent religions emphasizes that there were two major changes during the Axial Age period—a dramatic (p. 602) increase in the scale and scope of warfare and large-scale and rapid urbanization —that were disruptive of people's social attachments and sense of ontological security and made them receptive to religions emphasizing salvation and transcendence. Let's first discuss increases in the scale and scope of war.

Warfare

The principal form of polity during the Axial Age—and in fact long before—was the empire, and empires grew increasingly larger over time. The main reason empires form and grow larger is war: More war leads to larger empires and larger empires generate more war, in a classic case of a positive feedback loop. In the agrarian empires of the Axial Age, war was the principal means of acquiring wealth, in fact a kind of huge business (Snooks, 1996).

In China in the Spring and Autumn period (770–475 BCE), nobles rode chariots and used bows, and the infantry used lances. A major technological development during this period was the crossbow, which was used along with the sword. New iron technology, originally developed by the Hittites in the Near East around 1200 BCE, was used for the manufacture of new versions of weapons already used, such as swords, lances, and dagger axes (Lewis, 1999; Tanner, 2010). During the Warring States period (481–221 BCE), there was a dramatic increase in the scale of war. There were major changes in military technology and strategy. Chariots declined in importance, and there was a major shift toward large-scale infantries. Military campaigns lasted much longer, and there was greater military specialization, with experts in command emerging (Tanner, 2010). Siege warfare was also an important innovation, as was the increasing use of cavalry (soldiers on horseback), and cavalries accompanied infantries. In the previous period, armies numbered at most some 30,000 soldiers, but they became much larger during the Warring States. In the state of Qin, there were 1 million armored infantry, 1,000 chariots, and 10,000 horses. In Zhao, the state was able to field several hundred thousand armored men, 1,000 chariots, and 10,000 cavalry. In Chu, there were a million infantry, 1,000 chariots, and 10,000 cavalry (Lewis, 1999).

What was happening in China was happening in the Near East and South Asia. As in China, empire and war were aided dramatically by the development of iron weapons, which became widely disseminated after approximately 1200 BCE. The Assyrians had used

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a battering ram with an iron head, and Greek hoplite soldiers had bronze shields and helmets but iron swords and iron-tipped spears (Derry and Williams, 1960; Mann, 1986; Runciman, 1998). Gradually, iron weapons spread and helped intensify warfare and greatly increase the number of war casualties because iron weapons dramatically increased the killing power of combatants. The number of war deaths soared at the time the Axial Age was beginning. William Eckhardt (1992) has estimated that between the sixth and the fifth century BCE, the number of war deaths in Europe and the Near East multiplied some 18-fold, and that between the sixth and first centuries, (p. 603) or the entire extent of the Axial Age, war deaths increased far more dramatically, some 51-fold.

It was this dramatic increase in warfare, I contend, that was one of the crucial factors in the creation and spread of the world transcendent religions. Here is where Kirkpatrick's attachment theory and Giddens' notion of ontological security are highly relevant. As we know, war is tremendously socially disruptive and psychologically distressing. It is not difficult to see how a dramatic increase in the scale of war and the number of people being killed would create new needs for security and comfort. And not only do people die but many are uprooted and displaced from their homes, which reduces ontological security and creates a greater need for a substitute attachment figure. Recall that one of the major themes of the emerging Axial Age religions was love and mercy—God's compassion.

Consider in particular the situation of the Israelites. For centuries, the ancient Israelites were located at a crossroads between empires and, as a result, were often caught in the middle of wars between these empires (Eisenstadt, 1986b). They also suffered direct destruction from warfare. In 721 BCE, the Kingdom of Israel was overwhelmed by the Assyrians, and many leading Hebrew families were forced into exile (McNeill, 1963). In 586 BCE, King Nebuchadnezzar captured and destroyed Judah, sending much of its population into exile. These were massive social and political crises. William McNeill says that the Hebrews "had to wrestle with crushing national disaster and human suffering" (1963:157). Max Weber states that

> Syria became a theatre of hitherto unprecedented military events. Never before had the world experienced warfare of such frightfulness and magnitude as that practiced by the Assyrian kings. . . . The Israelite literature preserved from the period, above all, the oracles of classical prophecy, express the mad terror caused by these merciless conquerors. As impending gloom beclouded the political horizon, classical prophecy acquired its characteristic form. (1952:267)

Weber adds that the "popular fear of war surged up to them with the question as to the reasons of God's wrath, for means to win his favor, and the national hope for the future in general" (1952:300).

Norman Cohn (1993) contends that the so-called Yahweh-alone movement that marked the beginning of the transition of Judaism from its pagan origins to a monotheistic religion was a response to a situation of severe political insecurity. Jews were worried

about a "final defeat" and a "humiliation." Yahweh as a great god, as the only god, was a response to this situation. Yahweh might be punishing the Israelites for failing to live up to moral demands. If they lived up to these demands, he would save them from disaster. Finkelstein and Silberman state that

> we now know that the Bible's epic saga first emerged as a response to the pressures, difficulties, challenges, and hopes faced by the people of the tiny kingdom of Judah in the decades before its destruction and by the even tinier Temple community in Jerusalem in the post-exilic period. (2001:318)

(p. 604) These pressures, difficulties, and challenges were primarily the result of massive warfare. Concerning Antioch, a major city with a large Jewish diaspora population and then later a center of Christianity, Stark tells us that

> during the course of about six hundred years of Roman rule, Antioch was taken by unfriendly forces eleven times and was plundered and sacked on five of these occasions. The city was also put to siege, but did not fall, two other times. In addition, Antioch burned entirely or in large part four times, three times by accident and once when the Persians carefully burned the city to the ground after picking it clean of valuables and taking the surviving population into captivity. (1996:159)

Consider once again the case of China. The situation Confucius faced was one of social anarchy, brought on mainly by increasing warfare. Between the eighth and third century, conditions were very similar to what was happening in Palestine at the same time. In China, warfare had become almost continual, indeed virtually interminable. In previous times, prisoners of war were often held for ransom, but now conquerors killed them in large-scale executions. Entire populations were beheaded, even women and children, or, worse still, thrown into boiling cauldrons. Mass slaughters of up to 400,000 people have been reported (Smith, 1991).

Urbanization

The shift from bronze to iron metals also affected the technology of subsistence because the new iron plows were much more efficient cultivating instruments. Iron plows permitted increases in economic productivity and in the size of economic surpluses, which in turn made possible another major change that can be observed in the historical record in the time period after 600 BCE: expanding urbanization. Tertius Chandler (1987) has attempted to estimate the size of cities of 30,000 or more inhabitants in all regions of the world from very ancient times to the present. In 2250 BCE, Chandler estimates that there were only 8 cities in the world with a population of approximately 30,000 (total population of those cities = 240,000). By 650 BCE, Chandler identifies 20 cities ranging in population from 30,000 to 120,000 (total population = approximately 1 million). That represents about a fourfold increase in 1,600 years. But in the 220 years between 650

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and 430 BCE, the number of large cities (30,000–200,000) increased to 51 (total population = nearly 3 million), a threefold increase in a much shorter period of time; by 200 BCE, there were 55 cities of 30,000 or more (the largest being Changan, China, at 400,000) totaling almost 4 million people; and by 100 CE, the number of large cities (30,000–450,000) had reached 75 (total population = approximately 5 million). So in the centuries of the Axial Age, urbanization occurred on a far greater scale than in the previous two millennia: There were many more large cities, and the largest of these were much larger.

These increases in urbanization were largely facilitated by two conditions: increases in the size of economic surpluses and, more important, the expansion and deepening (p. 605) of world trade networks (Sanderson, 1999). The expansion of world trade networks and urbanization went hand in hand because cities were the primary foci of trade. Urbanization was also related to the growth of empires, and larger empires led, along with increased military might made possible by iron weapons, to the larger and more destructive wars discussed previously.

What were these cities and where were they located? All of the 20 largest world cities in 650 BCE were located precisely in those regions where the Axial Age proper was soon to begin: the Near East, India, and China. In 430 BCE, 50 of 51 of the largest cities were located in the very same regions. The corresponding figures for 200 BCE and 100 CE are 51 of 55 and 69 of 75, respectively. It is extremely noteworthy that 62% of the population of these cities in 650 BCE lived in or around the very small region that produced Judaism and Christianity; the figures for 430 BCE, 200 BCE, and 100 CE are 57%, 48%, and 48%, respectively. (See Tables A1–A4 in the Appendix for complete lists of the cities and their estimated sizes.)

George Modelski (2003) has made a concerted effort to improve on Chandler's city size data. (Modelski's figures for the Axial Age period are reported in Table A5 in the Appendix.) His methods and results differ in two important respects from Chandler's: He uses intervals of a single century and, for the time period we are considering, he sets a minimum city size of 100,000 instead of Chandler's 30,000 as the operational definition of a world city. Modelski tends to give higher estimates of city size compared to Chandler. For example, he considers Alexandria to have had 600,000 inhabitants in 200 BCE compared to Chandler's estimate of only 200,000, and, for the same period, Modelski estimates Loyang in China at 200,000 compared to an estimate of only 60,000 by Chandler. But sometimes Modelski's estimates are lower; for example, he estimates Changan in China in 200 BCE at only 100,000 compared to Chandler's much larger estimate of 400,000. Obviously, these are wide discrepancies.

Nevertheless, Modelski's data show the same overall pattern as Chandler's, which is a dramatic increase in the size of large cities during the Axial Age. As shown in Table A6 in the Appendix, Chandler shows a 276% increase in urban populations from the beginning of the Axial Age to 200 BCE, whereas Modelski shows a 352% increase. For the longer period between 650/600 BCE and 100 CE, Chandler shows a 386% increase, and Modelski shows an increase of 614%. The correspondence should actually be considered very close

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when we realize that both scholars are making estimates based on certain broad assumptions and inferences for a time period for which data are much more scanty and much less reliable than for more recent times. And the key point is that both Chandler's and Modelski's figures show very large increases in urban populations during the Axial Age.

It is not simply a matter of the number of cities and the size of their populations. The *density* of populations matters also. Densities in some cities in the Roman Empire were extremely high. Antioch had a population of some 100,000, but it covered a mere 2 square miles, thus giving it a density of 50,000 persons per square mile. And density in Rome was even greater, at approximately 150,000 per square mile. These are staggering (p. 606) figures for preindustrial cities without modern technology and modern conveniences (Stark, 2006).

But how, exactly, would an increase in urbanization create new religious needs? The answer, I think, is much the same as what was said regarding the huge increase in warfare: Rapid and large-scale urbanization was tremendously disruptive of people's lives. But what was it that was being disrupted? One thing was people's attachments to kin and other social intimates (Bellah, 2005; Marangukadis, 2006). People were increasingly living in a world of strangers. Given the enormous importance of kin relations to humans everywhere, this was a significant blow. And the strangers people were increasingly living among were not just non-kin, but members of alien ethnic groups. This brought with it increased ethnic conflict, which became another source of disruption. We return once again to Kirkpatrick and Giddens on the effects of the disruption of attachment bonds and the sense of ontological security. People turn to God, Kirkpatrick says, as a substitute attachment figure, especially when there has been some sort of disruption in their attachments to parents, and God functions psychologically as a safe haven and secure base. And, as noted previously, Giddens also specifically mentions religion as a major source of ontological security. This, I submit, is what was happening to encourage the formation of the Axial Age religions of compassion, love, and mercy. Life increasingly in a world of strangers led to a much higher level of insecurity and anxiety, and it was this (in conjunction with the massive intensification of warfare) that generated new religious needs. An all-powerful, loving God was an excellent prescription for people's new sense of threat and danger. Humans evolved to live in small groups of kin, which they did in hunter–gatherer, horticultural, and even most intensive agricultural societies. They did not evolve to live in densely packed cities in which most of their social relations were carried on with non-kin and strangers (Massey, 2005). The result was new psychological needs, and the world transcendent religions that offered love, mercy, and release from suffering evolved to assist people in adapting to their radically changed circumstances. McNeill puts it almost perfectly:

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Christianity, Hinduism, and Mahayana Buddhism provided perhaps the first really satisfactory adjustment of human life to the impersonality and human indifference that prevails in large urban agglomerates. Nature religions, personifying the forces of earth and sky, could meet the psychological needs of village farmers whose social ties to their fellows were personal and close. State religions were adequate for the early civilized peoples, whose cultural inheritance was nearly uniform and who maintained a close personal identification with the body social and politic. But when such uniformity and cohesion in civilized society broke down . . . such official, state religions could not satisfy *the growing number of deracinated individuals whose personal isolation from any larger community was barely tolerable at best*. . . .

Something more than either nature religion or a religion of state was needed for peace of mind in a great city, where strangers had to be dealt with daily, where rich and poor lived in different cultural worlds, and where impersonal forces like official compulsion or market changes impinged painfully and quite unpredictably upon daily life. Knowledge of a savior, *who cared for and protected* each human atom adrift (p. 607) in such mass communities . . . certainly offered men *a powerful help in the face of any hardship or disaster*. In addition the religious community itself, united in a common faith and in good works, *provided a vital substitute* for the sort of primary community where all relations were personal, from which humankind had sprung and to which, in all probability, human instinct remains fundamentally attuned. (1963:352–353, emphasis added)

But urbanization was also very likely important in another way. In his major study of early Christianity, Stark (1996) notes that during the period when Christianity arose, urban life was a source of chaos, misery, and crisis everywhere. People were often packed together in crowded tenements, living only in tiny cubicles. Privacy was scarce, tenements did not have furnaces or fireplaces, and rooms were smoky in winter. Problems of sanitation loomed large, and huge burdens were placed on systems of sewerage, water provision, and the disposal of garbage. "Most people in Greco-Roman cities," Stark contends, "must have lived in filth beyond our imagining" (1996:153). Moreover, the average Greco-Roman city must have been pervaded by infectious disease; mortality rates were very high, and thus longevity was short. Most people must have suffered from the pain and disability of chronic health problems. In addition, crime and disorder were no doubt rampant. Ethnic divisions and ethnic conflicts were common, and riots were a frequent occurrence (Stark, 1996). Describing the city of Antioch in particular, Stark states that it was "a city filled with misery, danger, fear, despair, and hatred" (1996:160). He notes,

People living in such circumstances must often have despaired. Surely it would not be strange for them to have concluded that the end of days drew near. And surely too they must often have longed for relief, for hope, indeed for salvation. (1996:161)

Continuing, he says that Christianity

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arose in response to the misery, chaos, fear, and brutality of life in the urban Greco-Roman world. Christianity revitalized life in Greco-Roman cities by providing new norms and new kinds of social relationships able to cope with many urgent urban problems. To cities filled with the homeless and impoverished, Christianity offered charity as well as hope. To cities filled with newcomers and strangers, Christianity offered *an immediate basis for attachments*. To cities filled with orphans and widows, Christianity provided *a new and expanded sense of family*. To cities torn by violent ethnic strife, Christianity offered a new basis for social solidarity. . . . And to cities faced with epidemics, fires, and earthquakes, Christianity offered effective nursing services. (1996:161; emphasis added)

Little wonder then that the Greco-Roman world in the first two centuries BCE witnessed an endless parade of messiahs coming to relieve people of their suffering (Harris, 1974).

Stark (1996) speaks only of Christianity, but there is no reason in principle why his argument does not apply to the other major world religions that arose during the same (p. 608) historical period. Indeed, because urban densities were even greater in India and China than in the Near East, the conditions of life may well have been even worse, and thus people may have had an even more critical need for salvation doctrines that offered them release from suffering.

Conclusion

This chapter's main aim has been to situate one major stage in the evolution of religion, world salvation and world transcendent religion, in its socioecological context and thereby explain why this new type of religion emerged when and where it did. The main argument has been that the enormously disruptive effects of the intensification of warfare and large-scale and rapid urbanization during the second half of the first millennium BCE—the Axial Age—created new human needs for ontological security, anxiety reduction, and release from suffering. People's existing social attachments were being threatened by the altered circumstances they faced. The old pagan religions of the ancient world were not up to the task of meeting these new challenges. As a result, religious sages and prophets began to formulate new religious ideas that resonated well with the masses and that began to spread far and wide and new religions were born.

In the Near East, these were monotheistic religions based on One True God—an omnipresent, omniscient, omnipotent, and compassionate deity to which people could form strong personal and heartfelt attachments. A new kind of God entered the world, one who could provide salvation in a heavenly afterlife for anyone who professed the faith and followed the commands that this God laid down. The new God was not like anything in nature, as many of the old gods were, and not at all like humans. He was a

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Transcendent God outside the mundane world and unlike anything with which people had previously been familiar.

In East and South Asia, something similar happened, as new transcendent religions developed there too. However, in these regions, a big god was usually not the only god, being accompanied by other, often preexisting gods. But the Near Eastern and East and South Asian religions were strikingly alike in being responsive to human suffering and the need for release from it. As Weber (1978) strongly emphasized, the non-Western religions were, like the Western ones, salvation religions. Because all were salvation religions with transcendent deities, and because all arose at a strikingly similar time in world history, an overall theory to explain their origin seems compelling.

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Table A1 Twenty Largest World Cities, 650 BCE					
Near East		**South Asia**		**East Asia**	
City	**Population**	**City**	**Population**	**City**	**Population**
Ninevah (Assyria)	120,000	Kausambi	55,000	Lintzu (China)	80,000
Memphis (Persia)	80,000	Ayodhya	35,000	Loyang (China)	70,000
Babylon (Persia)	60,000			Kingchow (China)	42,500
Miletus (Greece)	50,000			Hsintien (China)	40,000
Sais (Egypt)	48,000			Changan (China)	35,000
Marib (Arabia)	45,000			Pyongyang (Korea)	30,000
Jerusalem (Persia)	45,000				

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Ecbatana (Persia)	42,500		
Napata (Nubia)	42,500		
Calah (Assyria)	40,000		
Van (Persia)	35,000		
Susa (Persia)	30,000		
Total	623,000	90,000	297,500
Grand total: 1,010,500			

Note: Names in parentheses refer to the state, empire, or geographical location in which the city existed at the given time period. Some Greek cities were in Greek colonies in Italy or elsewhere.

Source: Chandler (1987, p. 460).

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Appendix Ancient Cities and Estimated City Sizes

(p. 614)   (p. 613)   (p. 612)   (p. 611)   (p. 610)   (p. 615)

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Table A5 Number and Size of Cities 100,000 or Larger, 700 BCE to 100 CE				
Century	**Near East**	**South Asia**	**East Asia**	**Total**
700 BCE	200,000 (2)		200,000 (2)	400,000 (4)
600 BCE	200,000 (2)		400,000 (3)	600,000 (5)
500 BCE	500,000 (5)	100,000 (1)	1,000,000 (8)	1,600,000 (14)
400 BCE	670,000 (5)	200,000 (2)	1,650,000 (12)	2,520,000 (19)
300 BCE	1,550,000 (7)	700,000 (3)	2,020,000 (11)	4,270,000 (21)
200 BCE	1,510,000 (7)	700,000 (4)	500,000 (4)	2,710,000 (15)
100 BCE	2,025,000 (8)	550,000 (4)	900,000 (5)	3,475,000 (17)
1 CE	2,160,000 (8)	600,000 (6)	1,860,000 (9)	4,620,000 (23)
100 CE	3,015,000 (11)	750,000 (6)	520,000 (2)	4,285,000 (19)

Note: Numbers in parentheses are the number of cities with 100,000 or more inhabitants.

Source: Modelski (2003, pp. 42, 44, 45, 49).

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Table A4 Seventy-five Largest World Cities, 100 CE					
Near East		**South Asia**		**East Asia**	
City	**Population**	**City**	**Population**	**City**	**Population**
Rome	450,000	Anuradhapura	130,000	Loyang (China)	420,000
Seleucia (Persia)	250,000	Peshawar	120,000	Soochow (China)	95,000
Alexandria (Egypt)	250,000	Paithan	82,500	Changan (China)	82,500
Antioch (Syria)	150,000	Patala	72,500	Nanking (China)	82,500
Carthage (Carthage)	100,000	Patna	67,500	Chengdu (China)	70,000
Smyrna (Rome)	90,000	Dohad	62,500	Wuchang (China)	67,500
Ecbatana (Syria)	82,500	Kavery	55,500	Tonggoo (China)	55,000

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Athens (Greece)	75,000	Broach	55,500	Kashiwara (Japan)	50,500
Edessa (Anatolia)	72,500	Madurai	50,000	Kanchow (China)	47,500
Nisibis (Anatolia)	67,500	Kolhapur	47,500	Taiyuan (China)	42,000
Zafar (Arabia)	60,000	Aror	47,500	Peking (China)	38,500
Rayy (Syria)	55,500	Srinigar	47,500	Pingchang (China)	38,500
Syracuse (Rome)	55,500	Benares	47,500	Canton (China)	38,500
Babylon	55,500	Ujjain	38,500	Kingchow (China)	38,500
Ephesus (Anatolia)	51,000	Junnar	36,500	Namhan (Korea)	36,500
Corinth (Greece)	50,000	Tosali	33,000	Keishu (Korea)	34,500

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Memphis (Egypt)	47,500	Jullundur	33,000	Hangchow (China)	33,000
Leptis (Libya)	47,500	Ayodhya	33,000	Changsha (China)	33,000
Balkh (Anatolia)	47,500			Tunhuang (China)	32,000
Merv (Turkmenistan)	42,000				
Stakhr (Persia)	42,000				
Pergamum (Anatolia)	40,000				
Apamea (Syria)	37,000				
Capua (Rome)	36,000				

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Byzantium (Anatolia)	36,000		
Thessalonica (Greece)	35,000		
Oxyrhyncus (Egypt)	34,000		
Angora (Greece)	34,000		
Milan (Rome)	30,000		
Petra (Jordan)	30,000		
Gortyn (Greece)	30,000		
Ostia (Rome)	30,000		
Total	2,513,500	1,060,000	1,336,000

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Grand total: 4,909,500					

Note: Names in parentheses refer to the state, empire, or geographical location in which the city existed at the given time period. Only 69 of the 75 largest cities are listed here because the others are New World cities that are far removed from the centers of the Axial Age.

Source: Chandler (1987, p. 463).

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Table A3 Fifty-five Largest World Cities, 200 BCE					
Near East		**South Asia**		**East Asia**	
City	**Population**	**City**	**Population**	**City**	**Population**
Alexandria (Egypt)	200,000	Patna	350,000	Changan (China)	400,000
Seleucia (Syria)	200,000	Ujjain	87,500	Pingcheng (China)	87,500
Carthage (Carthage)	150,000	Anuradhapura	65,000	Soochow (China)	65,000
Rome	150,000	Paithan	60,000	Loyang (China)	60,000
Antioch (Syria)	120,000	Taxila	60,000	Nanking (China)	51,000
Syracuse (Rome)	100,000	Benares	51,000	Lucheng (China)	39,000
Rayy (Syria)	87,500	Aror	51,000	Changsha (China)	38,000

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Athens (Greece)	75,000	Vaisali	51,000	Kaifeng (China)	32,500
Balkh (Bactria)	75,000	Tosali	51,000		
Corinth (Greece)	70,000	Kolkai	51,000		
Memphis (Egypt)	65,000	Broach	40,000		
Babylon (Syria)	65,000	Peshawar	39,000		
Ecbatana (Syria)	51,000	Kolhapur	36,500		
Jerusalem (Egypt)	51,000	Sopara	36,500		
Marib (Arabia)	51,000	Srinagar	32,500		
Rhodes (Greece)	42,000	Trichinopoly	32,500		

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Ephesus (Persia)	40,000	Madurai	32,500		
Cirta (Algeria)	39,000				
Meroe (Nubia)	36,500				
Messina (Greece)	35,000				
Pergamum (Anatolia)	35,000				
Damascus (Syria)	32,500				
Amasia (Greece)	32,500				
Cyrene (Phoenicia)	30,000				
Sparta (Greece)	30,000				

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Olbia (Sardinia)	30,000				
Total	1,893,000		1,127,000		773,000
Grand total: 3,793,000					

Note: Names in parentheses refer to the state, empire, or geographical location in which the city existed at the given time period. Only 51 of the 55 largest cities are listed here because the others are New World cities that are far removed from the centers of the Axial Age.

Source: Chandler (1987, p. 462).

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Table A2 Fifty-one Largest World Cities, 430 BCE					
Near East		**South Asia**		**East Asia**	
City	**Population**	**City**	**Population**	**City**	**Population**
Babylon (Persia)	200,000	Patna	100,000	Yenhsiatu (China)	180,000
Athens (Greece)	155,000	Benares	54,000	Loyang (China)	100,000
Syracuse (Syracuse)	125,000	Anuradhapura	47,000	Hsueh (China)	75,000
Memphis (Persia)	100,000	Sravasti	47,000	Soochow (China)	60,000
Ecbatana (Persia)	90,000	Vaisali	45,000	Lintzu (China)	60,000
Corinth (Greece)	70,000	Kausambi	39,000	Lucheng (China)	50,000
Susa (Persia)	70,000	Dantapura	37,000	Fenghsiang (China)	42,500

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Persepolis (Persia)	50,000	Rajagriha	32,500	Changsha (China)	40,000
Carthage (Carthage)	50,000	Ayodhya	32,500	Champa (Vietnam)	37,000
Jerusalem (Persia)	49,000	Trichinopoly	32,500	Pyongyang (Korea)	32,500
Meroe (Nubia)	47,000			Taiyuan (China)	32,500
Marib (Arabia)	45,000				
Ephesus (Persia)	42,500				
Sparta (Greece)	40,000				
Agrigentum (Greece)	40,000				
Argos (Greece)	40,000				

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Tarentum (Greece)	40,000				
Messina (Greece)	38,000				
Sidon (Phoenicia)	36,000				
Sardis (Anatolia)	35,000				
Croton (Greece)	35,000				
Tyre (Phoenicia)	35,000				
Cyrene (Phoenicia)	35,000				
Corcyra (Greece)	35,000				
Rome	35,000				

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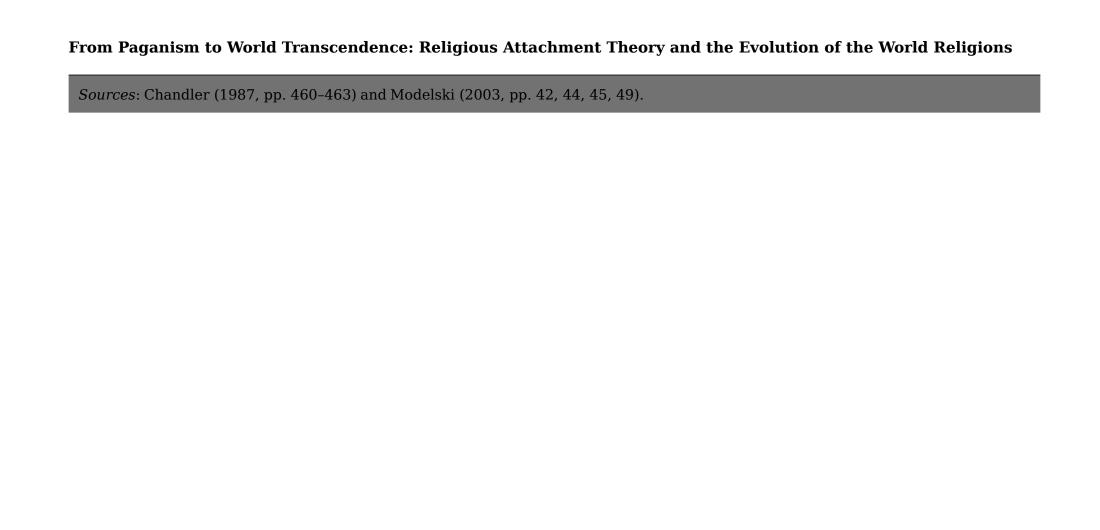|				
Gela (Greece)	35,000			
Kerch (Greece)	32,500			
Damascus (Syria)	30,000			
Elis (Greece)	30,000			
Total	1,665,000		466,500	709,500
Grand total: 2,841,000				

Note: Names in parentheses refer to the state, empire, or geographical location in which the city existed at the given time period. Some Greek cities were in Greek colonies in Italy or elsewhere. Only 50 of the 51 largest cities are listed here because the other is a New World city that is far removed from the centers of the Axial Age.

Source: Chandler (1987, p. 461).

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Table A6 Chandler's and Modelski's City Size Totals, 650 BCE to 100 CE				
Century	**Near East**	**South Asia**	**East Asia**	**Grand Total**
650/600 BCE	623/200	90/0	298/400	1,010/600
430/400 BCE	1,665/670	467/200	710/1,650	2,841/2,520
200 BCE	1,893/1,510	1,127/700	773/500	3,793/2,710
100 CE	2,514/3,015	1,060/750	1,336/520	4,910/4,285
Total % increase 650/600BCEto 200BCE				
Chandler, 276%; Modelski, 352%				
Total % Increase 650/600BCEto 100CE				
Chandler, 386%; Modelski, 614%				

Note: The first number is Chandler's estimate (cities > 30,000), and the second is Modelski's estimate (cities > 100,000). Numbers are expressed in thousands (e.g., 200 = 200,000).

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Sources: Chandler (1987, pp. 460–463) and Modelski (2003, pp. 42, 44, 45, 49).

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Notes:

(1.) Exceptions include Stark (2007), Bellah (2011), Bulbulia et al. (2008), Wright (2009), and Wade (2009).

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(2.) Some may question use of the term "pagan" because it has often been used pejoratively, especially in Christianity, to refer to those who adhere to traditional non-Christian or pre-Christian religions. Etymologically, pagan derives from the Latin *paganus*, meaning "rustic" or "country dweller." Yet the term continues to be used in a nonpejorative way by many students of religion, including highly respected historians (MacMullen, 1981, 1984; Stark, 1996, 2006, 2011; Athanassiadi and Frede, 1999; for further clarification, see Clark, 2004). Shorn of any pejorative implication, it is actually quite a good term.

(3.) These are the original dates used by Jaspers (1953, 1962), but they need not be sacrosanct. The end date leaves out Christianity, which I consider a crucial part of the Axial Age, and the start date is slightly early, as Judaism did not become a transcendent and monotheistic religion until approximately two centuries later. I prefer the dates 600 BCE to 1 CE.

(4.) It is not completely clear that the God or gods of the East and South Asian religions are genuinely transcendent inasmuch as they retain something of a human-like quality. Vishnu and Shiva, for example, are said to have relatives, consorts, or offspring, and thus to resemble pagan gods. But even if we were to concede that the Asian gods are not truly transcendent, they are certainly different from pagan gods. Common behavior among pagan gods is promiscuity, drunkenness, deception, adultery, and murder, among many other human-like things. The Asian gods do not behave in this way, not even remotely. Neither the Buddha nor the bodhisattvas get drunk, marry, have offspring, or commit murder. The same is true for Vishnu–Shiva, as well as for Confucius and Laozi. Such behavior would be unthinkable for them.

(5.) But see Saler and Ziegler (2006) and Koenig, McGue, Krueger, and Bouchard (2005) for discussions of research findings on the genetics of religiosity.

(6.) A much more extensive discussion of the adaptationist position, including a defense, can be found in Sanderson (2008).

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