Harnessing the Placebo Effect: 
Religion as a Cultural Adaptation

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Abstract

The prevailing view among scholars is that religion does not represent an adaptation. If religion is adaptive, its function is usually associated with the promotion of group solidarity and competitiveness. In this chapter, I argue that religion’s original adaptive function was the promotion of mental/physical health. Group solidarity was an element of this function and very likely emerged later as an adaptive function in its own right. Religion, however, represents a cultural, not an individual adaptation, and while it was fitness-enhancing in its environment of origin whether it continues to be so in the modern world is an open question.

1. Religion as a by-product

Most scholars ascribed to the view that religion does not represent an adaptation, but instead arises as the byproduct of multiple naturally evolved mental systems (Atran 2002; Boyer 2001; Kirkpatrick 2006). For example, our tendency to envision supernatural agents likely arises from a hyper-active agency detection system. Agency detection refers to the ability to attribute mental states, such as goals and desires, as causal forces behind behavior. The evolutionary demands of the hominin social world selected for a hyper-vigilant form of agency detection. Hearing voices in the wind, seeing strangers in the shadows,
feeling a threatening presence in a darkened room – while all of these are most likely mere illusions, a single instance of just one being real could be fatal. It is always more adaptive to over-attribute agency than to under-attribute it.

A hair-trigger agency detection mechanism is a useful adaptation. However, by virtue of its “hair-trigerness,” it is also ripe for supernatural extension. Lacking an immediately obvious cause, natural events from the mundane (e.g. the rising sun, falling rain, singing birds) to the extraordinary (earthquakes, eclipses, epidemics) represent prime candidates for inclusion into the domain of agency-attributed actions. So the rain falls because the ancestors want to help us grow our crops, or an epidemic rages through our village because the forests spirits are angry that we killed all the caribou. The important lesson is that while our hyper-vigilant, over-active agency detection system is an adaptation, using this system as a basis for constructing supernatural explanations for natural events is (very likely) not – it’s a byproduct. It is a highly probable way of thinking, but not necessarily a mode of thinking specifically designed by natural selection to solve an adaptive problem. Religion then, is like this. It takes naturally evolved mental and emotional systems, stretches and modifies them in highly probable ways producing a set of beliefs and practices that many people find useful and convincing.

At the level of the individual mind, this model of religion is probably correct. It is highly unlikely that an adaptive religious module exists in individual human brains comparable to a ‘cheater detection’ module or an infant attachment system. Instead, religion is an adaptive trait, not of individuals, but of social dynamics. Religion’s adaptive function exists at the cultural level – at the level of intra-group, inter-group, and group-environment interactions.

2. Culture as Adaptation

Imagine that you fell ill while visiting a traditional society in the Amazonian rain forest. You would probably do well to heed the advice of a local healer and eat the bitter-tasting plant that your naturally-evolved taste defenses urge you to reject. Why? Because the healer knows something that you don’t – under the right circumstances, prepared properly, and in the correct dosage – the dangerous plant can have medicinal
effects. Obviously the healer wasn't born knowing this. It was passed along as part of her traditional lore. In other words, it is an adaptive product of her culture. The lesson to be learned is that culture can be adaptive, so adaptive that it can compel us to engage in behaviors that would appear contrary to individual fitness interests (see Richerson & Boyd 2005, p. 11).

Examples of the adaptive function of culture abound. Millennia ago, European and Near-Eastern hearers developed dairing techniques that made milk and milk products abundantly available for nutritional purposes. So powerful was this cultural practice that that it placed strong selection pressure on the single dominant gene responsible for lactose tolerance in adults. Today, we descendants of these dairying peoples happily carry this gene and enjoy four varieties of cheese on our pizzas. Those from non-dairing cultures, such as Native Americans, Pacific Islanders, and Far Easterners retain the more ancient genetic pattern and are generally lactose intolerant as adults (Simoons 1970).

A second example can be found in the well-documented conflict between the Nuer and Dinka tribes of southern Sudan (Kelly 1985). In the early 1800s, the Nuer began a steady expansion and conquest of Dinka territories. The Nuer and Dinka, who were descended from common stock, shared much in common in terms of lifestyle, subsistence practices, and technology. An important difference existed in their cultural practices, however. For the Nuer, bride price payments were made exclusively to paternal relatives, while Dinka bride-price payments were diffusely spread across both paternal and maternal relatives. The Nuer's more restrictive policy had the effect of cultivating strong patriarchal alliances among Nuer clans. These alliances were critical in times of conflict. Dinka alliances were more fragile and less kin-based. In all their years of conflict there was not a single instance of a Dinka defeat of a Nuer army.

3. What is Religion?

One significant problem in understanding religion as an adaptation is trying to define exactly what religion is (see for example, Kirkpatrick 2006, pp. 165-166). Religion involves rituals, beliefs, behaviors, attitudes, moral codes, institutional bureaucracies, and a range of differ-
ent cognitive faculties and cultural traditions. Isolating which, if any, of these aspects of religion constitutes an adaptive response to an environmental problem is a formidable enterprise.

Religion's complexity stems from its many millennia of evolutionary history. To understand religion as a cultural adaptation, we must understand what it was when it first emerged, and what kind of world it was born into. After all, religion did not arise to help modern humans adapt to the modern world, but to help our ancestors deal with their ancestral world. Whether religion continues to be culturally adaptive is an open question. However, there is evidence (to be reviewed later) indicating that the original adaptive function of religion continues to resonate even today.

So what was religion originally? While we cannot be certain, the best evidence we have indicates that when religion first emerged, it was shamanism. Evidence for the shamanistic origins of religion takes two forms: (1) The fact that shamanistic practices are universal across traditional societies (Townsend 1999; Winkelman 1990), and (2) archeological remains indicating that shamanistic rituals extend back as far as 70,000 YBP. The archeological evidence includes: (a) Upper Paleolithic cave art and artifacts depicting shamanistic practices (Lewis-Williams 2002), (b) a 35,000 year old etching of what seems to be shaman in ceremonial regalia, and (c) a 70,000 year old snake-rock artifact from a deep cave site in Africa potentially used in shamanistic rituals (Balser 2000; Minkel 2006). Thus, the ubiquity and antiquity of shamanism argue for its evolutionary priority.

While shamanistic practices vary globally, they always involve some form of healing. Often this healing is quite effective for a range of maladies where a psychological component is present such as chronic pain, burns, bleeding, headaches, skin disorders, gastrointestinal disorders, and the discomforts and complications of childbirth (McClenon 2002). Typically, this healing is embedded within the context of dramatic, consciousness-altering rituals. For example, among the !Kung San of Southern Africa, healing dances are a bi-weekly occurrence. As they dance about a roaring fire, shaman-healers enter an altered state of consciousness called kia, and channel a mysterious healing force called n/um (Katz 1982). Thus, we can be reasonably confident that the primordial shamanism of our remote ancestors involved communal rituals that invoked a supernatural healing force. So for purposes
of understanding religion as a cultural adaptation, religion is defined as: shamanistic rituals of communal healing.

4. What was Religion’s Adaptive Function?

Shamanism arose to deal with the same ever-present ecological challenges that hominins had been facing for hundreds of thousands of years – maintaining group solidarity, dealing with illness and injury, and overcoming resource scarcity and competition. Shamanism emerged because these ecological stressors intensified around 70,000 ybp owing to rapid climate changes, possibly intensified by the massive eruption of Mount Toba on Sumatra Island (Alley 2000 pp. 118-126; Ambrose 1998). Shamanism proved to be more effective than other, older strategies in confronting these daunting challenges. Specifically then, the adaptive function of religion in its original form was the creation of unprecedentedly powerful conditions for placebo health and healing effects.

5. Placebo Effects

Placebo effects refer to the positive health outcomes associated with the psychosocial context of treatment. Recent reviews of placebo effects (Colloca & Benedetti 2005; Price et al. 2008) have identified three factors critical to the effect: (1) the suggestive context of treatment; (2) the expectancy and desire of the patient and (3) the degree of somatic focus on symptoms.

The suggestive context of treatment refers to the degree to which the patient is led to believe that a treatment will be effective. For example, when patients are told that they will receive ‘a powerful pain-relieving agent’ they report greater pain reductions compared to when they are told that there is a 50% chance that the pain reliever will be effective (Vase et al. 2002). This occurs even when the same substance is given in both cases. The suggestive context of treatment can also be enhanced by inducing an altered state of consciousness wherein the patient is more amenable to suggestion. This helps to explain the effectiveness of hypnosis in some treatment contexts (Bowers & LeBaron 1986; Brown 1994).
Expectancy refers to the degree to which the patient believes that a treatment will be successful. While this factor is often related to the context of treatment (a more reassuring context can produce greater expectancy), it is separable from it. For example, in a double-blind study to assess an experimental surgical treatment for Parkinson's disease, patients were randomly assigned to either mesencephalic transplantation surgery or sham surgery (McRae et al. 2004). In 12-month follow-up assessments, the actual treatment assignment had negligible effects. Instead it was the patient's belief that made a difference. Those who believed that they were in the real surgical condition showed significant improvements in both psychological (overall quality of life) and physical (motor control) outcomes.

Health outcomes are also affected by the patient's desire for healing. In a pair of similar studies involving treatments for irritable bowel syndrome, the patient's desire for pain relief was measured and found to significantly affect the degree of placebo relief achieved (Vase et al. 2003; Verne et al. 2003). All these studies demonstrate that a patient's belief can have significant effects on health outcomes regardless of the actual treatment he or she receives.

Finally, somatic focus refers to the extent to which a treatment leads a patient to selectively attend to certain areas of the body and monitor them for signs of improvement. Increases in placebo pain relief occur when patients are required to monitor their symptoms more frequently (Geers et al. 2006).

Along with these factors, social support (either perceive or real) also significantly enhances placebo healing. For example, breast cancer patients randomly chosen to receive psychosocial intervention along with medical treatment were found to have higher survival rates and lower recurrences of cancer compared to controls (Spiegel et al. 1989).

The health benefits of social support are very likely due (at least in part) to improved immune system function. Among medical students given a hepatitis B vaccine, those scoring lowest on a psychometric test of loneliness (indicating strong social support networks) mounted the greatest immune system response to the vaccine (Kiecolt-Glaser et al. 1984). The depth and diversity of one's social support networks appear to be particularly important to health. In a study of over 275 healthy volunteers, Cohen and colleagues (Cohen et al. 1997) found that those
with broader, more extensive social ties among family, friends, work colleagues, and community members were less susceptible to upper respiratory infections, and when infected, were faster to regain health and produced fewer and less severe symptoms (for reviews see Cohen 2001; Koenig & Cohen 2001, pp. 124-127). Elevations in mood and stress relief are also consistently associated with greater social support. These factors are also known to positively affect immune system function and to improve health outcomes.

By way of summary, it can be said that placebo healing arises from a potent psycho/social context. This context can be reduced to two broad factors: (1) the environment - which includes the degree of social support available to the patient and how convincingly a treatment’s efficacy is conveyed to the patient; and (2) the psychological state of the patient - which includes his or her confidence in the treatment, desire for healing, stress level, mood, state of suggestibility, and attentional biases toward signs of improvement.

The shamanistic healing rituals that emerged about 70,000 years ago created an unprecedentedly powerful psycho/social context for placebo healing. By invoking powerful supernatural healing forces and cloaking them in emotionally-compelling consciousness-altering rituals, both the psychological state of the individual and the supportive social framework around the individual were poised to promote healing. These healing rituals harnessed and amplified placebo effects by creating an environment where people, embedded within tightly cohesive social support networks, believed in the efficacy of a supernatural healing force. This created a self-reinforcing dynamic where the ritual context increasingly produced positive health and healing outcomes, and the outcomes strengthened the belief in the shamans and their rituals.

6. Religion and Placebo: Empirical Evidence

The model at hand states that religion originally emerged as shamanistic rituals of communal healing. These rituals offered an adaptive advantage in dealing with the recurrent problems of sustaining group solidarity and maintaining physical and psychological health in the face of constant challenges (e.g. illness, injury, deprivation, stressful childbirth, group competition etc.). If the model is credible, then evidence of
this function should still be present today. The evidence falls into three categories consistent with the factors necessary for enhancing placebo effects: (1) Religion’s capacity for creating a context of belief in healing power, (2) religion’s capacity for creating strong social support networks through highly cohesive and cooperative groups, and (3) religion’s connection to health, healing, and longevity.

6.1. A Reason to Believe

Social rituals that involve rhythmic dancing, chanting, and singing can have powerful analgesic and healing effects (for review see Mithen 2006 pp. 95-101, 151, 235-236). These effects are magnified when the supernatural is added. Recent studies have shown that meditative or contemplative practices that include supernatural references have greater capacity to reduce anxiety, elevate mood, and increase pain tolerance compared to secular practices (Wachholtz & Pargament 2005; Wiech et al. 2008).

Along with real increases in effectiveness, the dramatic and emotionally-riveting nature of rituals that invoke the supernatural very likely created events that appeared miraculous. Miraculous or unexplainable events can be effective in engendering belief in the supernatural (see McClendon 2002, p. 145-147). Furthermore, memory for placebo relief often becomes exaggerated over time increasing the intensity of the belief in the supposed ‘healing power’ responsible for the effect (De Pascalis et al. 2002; Price et al. 1999). Finally, accounts of ‘miraculous’ healing events from trusted sources (friends or family members) can often be as effective as direct experience in convincing someone of the power of supernatural or ritualistic healing. Thus, in our ancestral past, once shamans had developed an emotionally captivating way of presenting their healing ‘treatment,’ the beliefs that motivated those treatments could become self-reinforcing as tales of healing were transmitted from person to person, band to band.

What would the shamanistic healing rituals of our Paleolithic ancestors have been like? The healing rituals of extant traditional societies provide the best guide. These practices are dramatic indeed, and it is not hard to imagine that they would have created a powerful context for placebo healing events. For example, during !Kung healing ceremonies, the shamans who channel healing power engage in feats of physical endurance and pain tolerance that undoubtedly leave observers...
ers awe-struck. Richard Katz, who studied the !Kung and their healing traditions extensively, describes the activities of the shaman-healer Kana, while in the trance-state of kia:

Kana continues to walk around in the state of kia, like a tightrope walker. He is healing people who are sitting at the little fires on the outskirts of the dance fire. He ... presses his hands in the area of the chest, flutters them, and moans. He then goes back to the central dance fire, picks up several reddish-orange coals, and rubs them together in his hands, then over his chest and under his armpits. The sparks fly. He drops the coals back into the fire just as the singers begin to scatter (Katz 1982, p. 71).

Enduring self-inflicted pain as a demonstration of power is widespread among shamans. Healers and holy people across the globe walk on hot coals, plunge needles through their cheeks and tongues and have themselves suspended high in the air on ropes attached to giant hooks embedded in their backs (Powell 1914; McLenon 2002, pp. 5-6, 71). Often, these feats of pain tolerance are explainable in psycho/physical terms (Patterson et al. 1992). This, however, does little to diminish the spell-binding effect they have on the audience (both presently and certainly in our Paleolithic past).

6.2. Social Support

Social support is a key factor in placebo effects. While this factor is not inherently religious, there is evidence that religion is especially effective at creating high-quality social support networks. In a survey of nearly 3,000 people, Ellison and George (1994) found that even after controlling for a number of important social covariates (age, income, marital status, employment etc.), church attendance significantly predicted the number of non-kin social contacts, in-person contacts, telephone calls, and instrumental support that a person received. Furthermore, the perceived quality of these relationships was strongly correlated with church attendance, indicating that for many people their most meaningful social support was found in their church communities. Among a sample of older African-Americans, life satisfaction was closely connected to the number of friendships originating from church-related sources (Ortega, Crutchfield & Rushing 1983). When compared to secular groups such as bowling leagues or parent groups,
church affiliated groups in America have been found to have higher levels of within-group trust and commitment (Stolle 2001). Comparisons of religious and secular kibbutzim in Israel produce similar conclusions. Religious kibbutzim have significantly lower divorce rates and rates of adverse health events resulting from stressful life events. Study authors attribute these effects, in part at least, to stronger social support networks associated with religious ritual and belief (Anson, Carmel, Bonneh, Levenson, & Maoz 1990; Kark et al 1996).

These findings are consistent with those of sociologist Richard Sosis (see Sosis 2006 for review) who has repeatedly found that religious communes or kibbutzim are more cooperative and enduring than comparable secular ones. The level of trust Sosis found among the Jewish Haredi communities he studied was quite startling when considered against the norm of modern urban life:

... during my fieldwork among Haredi communities, I repeatedly observed invitations for meals, lodging, and rides by residents to unknown Haredi travelers. On several occasions, I witnessed cars being loaned to complete strangers, and interviews revealed a surprising number of interest-free loans offered and accepted between people who had previously not known each other (Sosis 2006, p. 67).

Henrich and Henrich (2007) report similar levels of cooperation and trust among the Chaldean community of Detroit, MI (USA). But this trust was predicated upon being an accepted member of the community, which required two essential traits: speaking the language and being part of the Chaldean Church (p. 204). Nearly all Chaldeans agreed that leaving the Chaldean Church meant that one was effectively excluded from the community (p. 180). The greater social support found in religious communities may also play a part in their higher fertility rates (Frejka & Westoff, 2008).

6.3. Religion and Health

Numerous studies have provided evidence that religious people are healthier, happier, live longer, and recover faster from illness and surgery (see reviews in Koenig et al. 2001; Koenig & Cohen 2002). For example, religious beliefs are predictive of positive outcomes following hip and heart surgery, and the degree of strength and comfort that one
Religion as a Cultural Adaptation

receives from religion is associated with faster recovery and greater longevity following heart surgery (Contrada et al. 2004; Oxman et al. 1995; Pressman et al. 1990).

The findings, however, are not always consistent. Spiritual beliefs have no correlation with recovery from spinal surgery, and religious involvement does not significantly impact survival rates of most cancer patients (Hodges et al. 2002; Ringdal et al. 1996). The general pattern appears to be that religion typically has modest positive effects on health and healing, but with many exceptions and inconsistencies (see Sloan & Bagiella 2002 for critical assessment). Again, this is not surprising given that religion’s original function was to enhance placebo effects, which are positive, but which only go so far (all the placebo effects in the world aren’t going to save you if you’ve been stomped on by a wooly mammoth.)

What is uncontroversial is the connection between religion and mental/emotional well-being. In a recent review of over 100 studies addressing the religion – well-being connection, Koenig, McCullough and Larson (2001, p. 117) found that 79% reported positive correlations. Furthermore, over 80% of the reviewed studies found a positive correlation between religion and increased hope and optimism, and no published study has found religious people to be less optimistic than non-religious (p. 215). Intrinsic religious commitment and active involvement in organized religious activities have been associated with lower rates of depression (p. 135). For example, religious involvement and belief among older men is associated with reduced incidence of depression and predictive of fewer depressive symptoms in six-month follow-ups (Koenig et al. 1992). Among those diagnosed with depression, greater intrinsic religiosity at baseline was predictive of a 70% increase in the speed of symptom remission (Koenig et al. 1998).

A general enhancement of well-being typically pays off in longevity. Twelve of 13 (92%) studies addressing religion and longevity have found positive associations, with many of these studies finding that the association remained significant even after controlling for a variety demographic, social, behavioral, and health-related factors (see Koenig & Cohen 2001 for review). For example, Strawbridge and colleagues (1997) followed over 5,000 people in Alameda county (CA) for nearly three decades and after adjusting for multiple potentially-confounding predictors of survival, concluded that religious involvement
was associated with a 23% reduction in the likelihood of dying during the study period. Using a similar format, Koenig et al. (1999) followed about 4,000 randomly selected older adults for six years and found that frequent religious attendance predicted a 28% reduction in mortality. Hummer et al. (1999) followed over 20,000 Americans age 18-65 for nine years, concluding that those who attended religious services at least once a week lived an average of seven years longer than non-attendees. Finally, a retrospective comparison of religious versus secular kibbutzim matched on a range of socio-economic, educational, demographic, and prior health factors, found a significantly lower mortality rate for the religious kibbutzim members (Kark et al. 1996). Over a ten year period, the religious kibbutzim averaged 5.67 deaths per 1000 person-years for men and 2.33 for women. For the secular kibbutzim the averages were 9.96 for men and 6.34 for women.

A good deal of heat has been generated about religion and health — much of it focusing on whether the positive effects of religion are attributable to 'religion itself' or the many potentially health-enhancing factors associated with religion (e.g. increased social support, healthier lifestyles, moral codes, hope and optimism, sense of purpose, etc.). While teasing apart these individual factors has important scientific relevance, it misses a critical point: all of these so-called 'confounding' factors, bound together by rituals and beliefs, are religion itself! Religion was the mechanism by which all these placebo-relevant factors were consolidated. Religion’s adaptive function was (and in many respects still is) placebo consolidation. So while optimism, healthy lifestyles, strong social support networks, the belief in healing power, and the expectation of positive outcomes are in no way available exclusively to religious people, being part of a religious community plays an important role in making them more readily available. By bringing them together in a coherent, compelling way (by virtue of a supernatural narrative and emotion-laden rituals) religion made placebo healing a potent cultural force, and that force continues to echo even in modern times.
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Rossano


Religion as a Cultural Adaptation


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Religion as a Cultural Adaptation


**Please note**

Adapted from chapter 7 of Rossano (2010)