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Shamanic Healing, Human Evolution, and the Origin of Religion

JAMES MCCLENON[†]

It is likely that *Homo sapiens* practiced shamanic healing for many millennia. Studies within anthropology, folklore, hypnosis, medical history, psychoneuroimmunology, and religion support the argument that suggestions embedded within shamanic rituals have therapeutic effects. Shamanic/hypnotic suggestions may reduce pain, enhance healing, control blood loss, facilitate childbirth, and alleviate psychological disorders. Those more responsive to such suggestions are hypothesized to have a survival advantage over the less susceptible. As a consequence, shamanic rituals selected for genotypes associated with hypnotizability, a trait correlated with frequency of anomalous and religious experiences. With the evolution of psychophysiological structures associated with hypnotizability, modern forms of religious sentiment became possible.

Religion has been defined as “a set of rituals, rationalized by myth, which mobilizes supernatural powers for the purpose of achieving or preventing transformations of state in man and nature” (Wallace 1966: 107). An evolutionary scenario explains the origin of such rituals. Ancient primates probably used rudimentary rituals to alleviate social stress. Hominids are assumed to have devised more complex rituals, producing therapeutic altered states of consciousness (ASC). At some stage, *Homo sapiens* devised shamanic/hypnotic therapies, coupling ASC with suggestion. Because such practices were effective, these rituals selected for genotypes associated with hypnotizability. With increased frequency of these genotypes, religious sentiment, myths, and ideologies justifying ritual became possible.

Genetic research provides evidence supporting this scenario. Religious sentiment (the attitudes, thoughts, and judgments prompted by feelings associated with therapeutic ASC) has a genetic basis. Comparisons of identical and fraternal twins reared apart indicate that approximately 50% of the observed variance of measures of religious interest, attitudes, and values are genetically influenced (Waller et al. 1990).

Most social psychological theories regarding the origin of religion assume that religion developed as a result of cognitive need, father projection, or superego projection (Argyle and Beit-Hallahmi 1975: 180–89). Tylor (1871/1958) ascribed the first religious impulses to the misinterpretation of dreams, trances, apparitions, visions, shadows, reflections, losses of consciousness, and death. Durkheim (1915/1965) argued that early humans attributed the sensations of group activity to religious forces, allowing worship of group collectivity. Freud (1964) theorized that religious impulses originated with neuroses derived from the Oedipus complex. Other theorists emphasize factors such as the “cognitive imperative,” a mechanism generating causal explanations hypothesized to produce myth when faced with existential questions (d’Aquili and Laughlin 1979). Unfortunately, these theories are not particularly amenable to empirical evaluation (Wallace 1966).

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The proposed model portrays religion as the evolutionary product of therapeutic ritual and language. The scenario coincides with Charles Darwin's suggestion that hominids acquired the capacity for song (voluntary modulations of vocal cries) as a stage in the evolutionary process leading to language. Donald (1991: 168) argues that this entailed a nonlinguistic, "mimetic" culture based on conscious, self-initiated, representational acts. Mimetic behavior includes pointing, gestures, simple games, ritual dance, chanting, and nonlinguistic song.

A variety of evidence supports this scenario. Hominid fossils reveal a gradual cranial enlargement, progressive changes of the basal surface of the skull, morphological asymmetry of the hemispheres, and other markers associated with the gradual development of the modern vocal apparatus (Lieberman 1984). Virtually all studies of the structures of intelligence indicate that musical talent is a separate factor from verbal skill. Language acquisition follows a completely different developmental path than does musical ability; all normal children, in all cultures, learn to speak around the age of 2 or 3, while musical ability develops later. In addition, damage to the right temporal region, causing loss of control of vocal volume, pitch, tone, and emphasis, can occur independently of damage to the left temporal region, associated with loss of phonetic control. This evidence suggests that hominids/humans acquired singing ability *prior* to language since mimetic song provides a bridge to speech but affords little additional communicative power (Donald 1991).

Mimetic rituals such as chanting, singing, drumming, dancing, and other repetitive behaviors produce ASC (Neher 1962; Schumaker 1995). ASC is defined as "a qualitative shift" from normal patterns of mental functioning, a subjective sensation associated with behavioral changes (Tart 1969: 2). *H. erectus* probably engaged in ASC rituals because of resulting pleasant sensations. Mild forms of ritual ASC are equivalent to the relaxation response, characterized by EEG changes and reduced heart rate, blood pressure, respiratory rate, and blood lactate levels, parameters affecting a wide variety of medical disorders (Benson et al. 1976; Gellhorn and Kiely 1972). The relaxation response can become hypnosis when coupled with suggestion (Benson, Arns, Hoffman 1981). *H. sapiens* with an aptitude for hypnotic dissociation can demonstrate trance and possession states, components of shamanic performance. A wide variety of trance induction techniques (chanting, rhythmic singing, drumming, meditation, and other sensory overload and restriction techniques) appear outwardly different but lead to a common state of parasympathetic dominance and a slow wave synchronization of the frontal cortex (Winkelman 1986, 1992).¹

The proposed scenario portrays shamanism as a cultural adaptation to biologically based ASC and associated adaptive potentials. This theory coincides with Winkelman's (1992) cross-cultural analysis of magico-religious practitioners. Shamans were the only type of magico-religious practitioner found in hunting and gathering societies; no shamans were found in sedentary societies. The types of magico-religious practitioners present in a society reflect its social complexity. The data support the argument that shamanic healing was "present in all regions of the world at some time in their hunting and gathering past" (Winkelman 1992: 50).

The model hypothesizes that humans benefiting most from shamanic/hypnotic rituals had survival advantages. As a result, the process selected for genotypes associated with hypnotizability. Modern research indicates that hypnotizability is distributed somewhat normally and is relatively stable over the life course (Hilgard and Hilgard 1983). High hypnotizability coincides with frequent anomalous and religious experiences, perceptions providing foundations for religious belief (Hood 1973; McClenon 1994). Such experiences, coupled with hypnotic suggestibility, allow development and acceptance of ideologies supporting religious ritual (Schumaker 1990, 1995).

The proposed model is based on the principle of selection at the individual level, a process most biologists believe to be more robust than group selection (Trivers 1985: 67–85;

but see Wilson and Sober 1994). The evolution of religious rituals due to their promotion of intragroup cohesion (d'Aquili 1985) could occur contiguously with the proposed model but implies group selection.

Discussion of Terms within the Model

Ritual constitutes the performance of more or less invariant sequences of formal acts or utterances not encoded by its performers. The proposed model suggests that the "invariant sequences" within ancient rituals were recipes for inducing therapeutic ASC. Early religious ideologies were ideas justifying these practices. *Shamanic/hypnotic rituals* are defined as acts that manipulate cultural symbols while inducing ASC, thereby influencing psychophysiological states. The use of symbols during rituals provides cues guiding participants' reactions. *Shamanic/hypnotic suggestibility* is the degree to which an individual responds to such actions.

Although shamanic/hypnotic suggestibility could be operationally defined by measuring physiological response to culturally specific ritual treatments, no standardized tests exist. Hypnotizability is operationally defined as the degree of response to suggestions following standardized hypnotic inductions (Perry, Nadon, Button 1992).² Standardized laboratory hypnotic inductions use one of many techniques available to shamanic practitioners (Schumaker 1995). The degree to which laboratory *hypnotizability* corresponds to *shamanic/hypnotic suggestibility* should vary among settings and cultures.

Evaluation of the Model

The proposed model can be tested through studies in animal behavior, anthropology, folklore, hypnosis, medical history, psychoneuroimmunology, and religion. Although we cannot reconstruct prehistorical cultures, we can extrapolate backward by evaluating modern data, based on the principle of uniformitarianism. The theory has five testable features: (1) Shamanic/hypnotic rituals increase survival and fertility. (2) The efficacy of shamanic/hypnotic ritual is correlated with hypnotizability. (3) Hypnotizability has a genetic component. (4) Shamanic/hypnotic rituals were practiced for sufficient time to have meaningful impact on the frequency of hypnotizability genotypes. (5) Hypnotizability affects the frequency and characteristics of anomalous, paranormal, and religious experiences, shaping religious ideological development.

1. *Shamanic/hypnotic rituals increase survival and fertility.* It is generally assumed that shamanic rituals increase survival and fertility due to psychological mechanisms. Many anthropologists have observed that shamanic rhetorical practices provide benefits, particularly for mild psychiatric and psychosomatic disorders (Csordas and Kleinman 1990; Finkler 1985; Frank 1973; Kleinman 1980; Kleinman and Sung 1979). Although shamanic efficacy can be attributed, in part, to herbal and placebo effects, many observers note that hypnosis plays a role (Schumaker 1990, 1995). Folk healing accounts contain features suggesting hypnotic processes (McClenon 1997). This observation coincides with psychoneuroimmunology research (Friedman et al. 1996). Because psychosocial factors influence susceptibility to, and progression of, many diseases, folk hypnotic suggestions affecting emotional states can alter fertility and mortality.

Hypnosis has been demonstrated through controlled studies to alleviate dissociative, posttraumatic stress as well as psychophysiological and other neurotic-level disorders of a circumscribed nature (Nash 1992: 152), reduce surgical blood loss and postsurgical pain (Rapkin, Straubing, and Holroyd 1991), treat hemophiliacs (Swirsky-Sacchetti and Margolis 1986), and reduce complications during pregnancy and delivery (Harmon et al. 1990; Jenkins and Pritchard 1993; Mehl 1994; Omer, Palti, Friedlander 1986). Folk healing

accounts coincide with hypnosis research most specifically for burns, hemorrhage, and childbirth (Dorson 1947; Sammons 1992; Snow 1993).

Because psychopathologies influence rates of coital inability, conceptive failure, pregnancy loss, and infertility (McFalls 1979), shamanic/hypnotic treatments would be expected to affect fertility. Folklore from many localities coincides, to a degree, with hypnosis research in supporting this assumption (Crasilneck 1982; Venn 1986).

2. *The efficacy of shamanic/hypnotic ritual is correlated with hypnotizability.* Although mechanisms governing hypnosis differ from those creating placebos (Spiegel and Albert 1983; Van Dyck and Hoogduin 1990), hypnotherapies produce both hypnotic and placebo effects. Placebo effects result from expectancy while hypnotic results are attributed to hypnotizability. Hypnotic and placebo effects cannot be distinguished in clinical trials without controlling for hypnotizability (Hilgard and Hilgard 1983).

Although hypnotic inductions facilitate response to suggestions, inductions are not required to elicit "hypnotic" response from hypnotizable individuals (Hilgard and Hilgard 1983). Responses to suggestions provided without formal inductions ("waking" suggestions) are correlated with hypnotizability (r is often about .6; Woody, Bowers, Oakman 1992: 25). Hypnotizable people may unconsciously use self-hypnotic strategies, particularly if they recognize cues signifying the value of hypnotic response. Religious rituals contain many such cues; as a consequence, hypnotizable individuals are hypothesized to respond more fully to ASC components within religious rituals and consequently to receive greater therapeutic benefits.

The relationship between hypnotizability and the clinical efficacy of hypnotherapy has been well established through controlled studies with regard to many disorders: pain, phobias, psychosomatic disorders, warts, migraine headaches, burns, and asthma (Bowers and Le Baron 1986; Brown 1992: 448–50). Hypnotizability is predictive of brief psychotherapy outcome (Nace et al. 1982). Other series of studies linking hypnotherapeutic effectiveness to hypnotizability have been suggestive but not fully conclusive: postsurgical recovery (Blankfield 1991; Brown 1992: 440–41), control of blood loss during surgery (Rapkin, Straubing, and Holroyd 1991), and childbirth complications (Venn 1986).

3. *Hypnotizability has a genetic component.* Studies with twins indicate that hypnotic and waking suggestibility have genetic bases (Duke 1969; Morgan 1973; Morgan, Hilgard, and Davert 1970). For example, a sample of 140 pairs of twins revealed a significant heritability index for the scores of the twin pairs and a significant correlation between the midparent hypnotizability score and the mean score (Morgan 1973). Hypnotizability is one of many cognitive-related variables such as EEG response, sleep patterns, and evoked brain potentials, which are influenced by genetic factors (Buchsbbaum and Gershon 1980).

These findings coincide with folklore from a wide variety of cultures. Shamanic magical abilities, related to achieving trance, are thought to be both learned and inherited. Thompson's (1966) *Motif-Index of Folk-Literature* includes "Magic power inherited" (D1737) and "Witch's power inherited" (G224.9).

4. *Shamanic/hypnotic rituals were practiced for sufficient time to have meaningful impact on the frequency of hypnotizability genotypes.* Many animals demonstrate "hypnotic" states during which they appear stuporous and dreamy, a phenomena labeled the "Totstell reflect" or "animal hypnosis." In response to repetitive stimuli, sudden changes of position, or restrictions of mobility, they automatically become immobile (play dead), an instinctive behavior that may trick predators into leaving them alone. Species-specific reactions appear shaped by predators, mating behavior, and other factors, and vary in degree among animals (Hoskovec and Svorad 1969; Volgyesi 1966).

The hypnotic capacity of chimpanzees appears shaped by their need to live collectively. Chimpanzees, rhesus monkeys, stump-tailed monkeys, and bonobos display rituals associated with aggression and reconciliation (de Waal 1989). Ritual grooming in chim-

panzees functions to alleviate aggression and sometimes produces the sleepy, stuporous appearance associated with ASC (Van Lawick-Goodall 1978). Chimpanzees respond hypnotically to repetitive verbal commands by humans, a reaction more similar to human hypnosis than that of nonprimates (Volgyesi 1966).

The model proposes that ancient primate hypnotic capacities were shaped by evolutionary processes in a direction that facilitated group living. Physical evidence allows the development of a 7-step time frame pertaining to this scenario:

1. Fire keeping was mastered by *H. erectus* by 700,000 BP (Haviland 1997: 197). *H. erectus* may have spent millennia gazing into fires while chanting, singing, and engaging in mimetic rituals, activities inducing therapeutic ASC.

2. Seemingly intentional middle Paleolithic human cave burials, from around 70,000 BP, indicate clear binary patterns regarding position, grave objects, and orientation (Smirnov 1989). This evidence suggests rudimentary religious ritual and ideology.

3. Adult male Neanderthals at La Chapelle-aux-Saints and Shanidar (roughly 50,000 BP) reveal serious skeletal deficiencies including arthritis, dental disease, paralysis, and broken bones. Evidence of survival long after onset of these infirmities suggests care by others (Stringer and Gamble 1993).

4. A currently popular theory specifies that rapidly spoken language with arbitrary phonemes existed about 40,000 BP (Davidson 1991). Alternate theories suggest far earlier dates. Language makes shamanic/hypnotic rituals possible.

5. Paleolithic European cave art (30,000 BP), South African rock paintings (45,000 BP), and rock art in Australia (45,000 BP) contain elements suggesting that they were created and/or visited in ASC or inspired by people experienced with ASC (Lewis-Williams and Dowson 1988; Haviland 1997: 233–39). Cave art contains features indicating ritual activity, dance, costumes, and music, behavior suggesting use of ASC (Pfeiffer 1982).

6. Before 30,000 and until 14,000 BP, stylized figures of women, termed “Venus statues” were constructed in Europe and Russia. Some scholars suggest these images were associated with religious fertility cults. The figures may have been used in “some sort of accompanying ritual to help ensure the delivery of a healthy infant” since the small size of the human birth canal contributed to birth complications (Pfeiffer 1982: 204). One Paleolithic carving on bone portrays a reindeer stepping over a pregnant woman, suggesting a relationship between shamanic ritual and fertility.

7. Paleolithic people, at various locations, bored holes in living individuals’ skulls, leaving several hundred specimens as evidence of this nonfatal operation. They also cut out and perforated pieces of bored skulls after the individual’s death, behavior implying the use of necklace amulets (Sigerist 1951: 112).

One means of guessing at prehistorical medical practices is to extrapolate backward from early inscriptions left by ancient cultures. This evidence indicates a universal linkage between medical practices, religious belief, and hypnotic ritual. The most ancient Egyptian and Sumerian medical texts coincide with later writings from other areas in placing emphasis on incantations, amulets, prayers, spells, and religious rituals as a means of medical treatment. The only type of hemostasis beyond compression and poultice mentioned by Homer is an *epaoide*, which means singing a song or reciting a charm over the wound (Sigerist 1951).

The anthropological study of folk societies provides an additional source of data useful for extrapolation. Faith healing and institutionalized ASC are seemingly universal (Bourguignon 1973; Eliade 1974; Murdock 1945). Cross-cultural analysis suggests that shamanism, the result of cultural adaptation to biologically based ASC, is the origin for all later religious forms (Winkelman 1986, 1992).

Lumsden and Wilson (1983: 152) argue that the coupling of genes and culture drove the growth of human intellect forward at a rate perhaps unprecedented in the history of life.

They contend that a "thousand year rule" applies: the coevolution of genes and culture could cause significant genetic changes within a mere 50 generations, or approximately 1,000 years.

Although exponential models of genotype frequency change are merely approximations, calculations reveal the plausibility of the proposed scenario. If shamanic treatments caused the incidence of genotypes related to high hypnotizability to increase by 2% each generation (a conservative estimate in light of modern research), genotype prevalence would expand from 1% to the 15% found in modern populations during 138 generations (2,760-year estimate). Additional factors make modeling complex: (1) Hypnotizability cannot increase limitlessly since extreme forms are associated with psychopathology (Wickramasekera 1988). (2) Various societies use shamanic/hypnotic rituals for both benevolent and malevolent purposes; malevolent use could reduce hypnotizability genotype prevalence. (3) A society's attitudes and values regarding hypnotizability affect fertility of those with the trait. The scenario remains plausible since *H. erectus* probably experienced group ASC around fires 700,000 years ago and *H. sapiens* could have used shamanic/hypnotic rituals for healing for over 30,000 years. There was sufficient time for a modest genotype selection mechanism to have meaningful impact.

5. *Hypnotizability affects the frequency and characteristics of anomalous, paranormal, and religious experiences, shaping religious ideological development.* Variables correlated with hypnotizability include frequency of spontaneous anomalous and paranormal experiences (Nadon and Kihlstrom 1987; Pekala, Kumar, and Cummings 1992; Richards 1990; Wagner and Ratzeburg 1987; Wickramasekera 1988; Wilson and Barber 1983), frequency of religious experiences (Argyle and Beit-Hallahmi 1975: 97–99; Hood 1973; Gibbons and De Jarnette 1972; Schumaker 1995), and variance in temporal lobe alpha output (Persinger 1990; Persinger and Makarec 1993).

Spontaneous anomalous and paranormal experiences include apparitions, out-of-body experiences, extrasensory perceptions, sleep paralysis, and contacts with the dead. All European and U.S. national samples report spontaneous extrasensory perceptions and contacts with the dead (over 50% of American respondents claim extrasensory perceptions). Narratives gathered from random samples of American, European, Chinese, and Japanese college populations reveal common elements, suggesting a physiological basis for these reports. Frequencies of reports are not significantly correlated with scientific training or religiosity (McClenon 1993, 1994).

Frequency of paranormal perceptions, as well as hypnotizability, are moderately correlated with signs of temporal lobe lability. Patients with electrically active foci within their temporal lobes report a predictable cluster of experiences that can be evoked by surgical stimulation. These experiences include visual hallucinations, sense of a spiritual presence, mystical (paranormal) experiences, and anomalous voices or sounds. Such experiences have intense personal meaning and powerful impacts on subsequent behavior, attitudes, and beliefs. As with excessive hypnotizability, extreme temporal lobe lability is associated with pathology (Makarec and Persinger 1990; Neppe 1983; Persinger and Makarec 1993).

Anomalous and paranormal perceptions generate belief in souls, spirits, life after death, and anomalous capacities (McClenon 1994). Since elements within these perceptions transcend culture, such experiences could have contributed to the development of Paleolithic burial practices. Extrasensory perceptions, contacts with the dead, apparitions, and out-of-body experiences are hypothesized to have generated beliefs providing foundations for shamanic performances such as trance possession, divination, and spiritual flight.

Hypnotizability is also correlated with the incidence of religious experience (Argyle and Beit-Hallahmi 1975: 97–99; Gibbons and De Jarnette 1972; Hood 1973; Schumaker 1995). Hypnosis has the characteristic of "nonvolition," the perception that suggested move-

ments and sensations are involuntary (Woody, Bowers, and Oakman 1992: 8–14). In analogous fashion, religious experiencers report being affected by exterior spiritual entities. Hypnosis entails heightened suggestibility coupled with dissociation, the capacity to compartmentalize cognitive functions. In a parallel manner, religious individuals accept implausible ideologies while retaining those critical functions required for survival.

Researchers note correspondences between religious orientation, setting, and the incidence of both “spontaneous” and “induced” religious experience (Hood 1995). It is assumed that hypnotic processes allow shamanic experience of spiritual flight and other visionary out-of-body phenomena (Eliade 1974). Hypnotic suggestions, embedded in the social context, can take effect long after a ritual’s completion (posthypnotic suggestion). Gibbons and De Jarnette (1972: 152) interviewed 185 undergraduates who had been administered the Harvard Group Scale of Hypnotic Susceptibility: “[A]ll of the high-susceptibles who professed having been ‘saved’ reported that the experience was characterized by profound experiential changes, while none of the low-susceptible group reported such phenomena.” Their data support the conclusion that conversion and salvation, and, by extension, other forms of religious experience, are types of hypnotic phenomena generated by the social environment.

Although modern religious doctrines have become highly ramified in reflection of hierarchical social structures, religious ASC continues to provide therapeutic benefits. Health outcomes have been found to be highly correlated with an index of spiritual experience (Kass et al. 1991). Meditation, a prevalent and ancient religious practice, provides the greatest therapeutic benefits for those most hypnotizable (Heide et al. 1980). Use of meditative prayer (Poloma 1993) and the incidence of mystical experience (Greeley 1975) are better predictors of existential well-being than standard demographic variables.

CONCLUSION

Evidence supports the model’s major features. Shamanic rituals increase survival and fertility, in part by hypnotic processes. Hypnotizability has a genetic basis. There was sufficient time for the proposed mechanism to significantly increase the frequency of genotypes related to hypnotizability. Psychophysiological parameters, associated with hypnotizability, affect the incidence of anomalous, paranormal, and religious experiences. This process is assumed to have shaped religious ideological development.

This theory explains a wide variety of findings within the fields of anthropology, folklore, hypnosis, medical history, psychoneuroimmunology, and religion. The model is subject to verification, revision, or rejection through testing hypotheses derived from it.

NOTES

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¹ Winkelman (1986) bases this conclusion on analysis of data regarding 59 magico-religious practitioners from a stratified subsample of 45 societies selected from the Standard Cross-cultural Sample (Murdock and White 1969).

² Although researchers disagree regarding precise physiological correlates of the hypnotic “state,” high and low hypnotizability can be differentiated by EEG parameters, related to the ability to maintain sustained attention (Crawford 1994).

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