

practices and genetically influenced personal characteristics in almost all cultures. As an example, Singh presents the case of a shaman who possesses a genetically determined personal characteristic and attains higher credibility than a rival shaman who possesses equally convincing practices but lacks that credibility-bolstering characteristic. Because shamanistic practices often carry evolutionary costs (e.g., celibacy, starvation, chemical toxicity) and because many credibility-bolstering personal characteristics do not necessarily carry these costs, shamans who established their credibility strictly through cultural practices frequently would be at a disadvantage compared with shamans with additional beneficial personal characteristics. This implies the third and final reason to be discussed: The phenomenon of shamanism has biological, psychological, and cultural repercussions.

Many evolutionary psychologists have argued that the genes that contribute to the development of schizophrenia were selected for because of their association with shamanism (e.g., Polimeni & Reiss 2003). Despite myths to the contrary, however, schizophrenia is more often than not a highly debilitating disease, both socially and interpersonally. It is a highly genetically influenced disease of a polygenic nature (many genes, each with a small but cumulative effect), which may indicate that relatives of schizophrenic people may have similar propensities and related behaviors without the debilitating side effects. The same is true of related disorders such as schizotypal personality disorder, which is characterized by odd beliefs, magical thinking, highly superstitious behavior, and beliefs in telepathy, clairvoyance, or a sixth sense (e.g., Segal et al. 2006). Further, evidence suggests that schizophrenia and schizotypal personality disorder overlap substantially, both genetically and neurobiologically (e.g., Ettinger et al. 2014), such that the milder but highly related version of schizophrenia, that is, schizotypal personality disorder, may be particularly advantageous to shamans. In the same vein, the major personal characteristic implicated by the charlatanism hypothesis of shamanism, namely, deceitfulness and conning others, has been found ubiquitously in all cultures with individuals who have antisocial personality disorders, and the latter is also polygenic and highly genetically influenced (e.g., Rosenström et al. 2017).

Additionally, following the agricultural revolution, shamanism may have been a contributor to the co-evolution of cultures with local psychoactive substances, especially those that alter perceptions. The universal cultural practice of ingesting psychoactive substances dates back to pre-agricultural societies and was motivated primarily by shamanism, ritual, and medicine (e.g., Wadley 2016). Following the advent of farming, it appears that various cultures began to domesticate psychoactive substances, including those that alter perceptions and mood. Therefore, it is also theoretically possible that, if shamanism had not been common in ancient societies, many perception and mood-altering substances (such as psilocin, mescaline, and scopolamine) may have been less prevalent or less prestigious in subsequent generations.

The emergence, development, and repercussions of shamanic traditions all involve dynamic interaction between biological, psychological, and cultural factors. By viewing shamanism as only a suite of practices and focusing primarily on how shamanic practices have been shaped by cultural pressures, we think Singh presents a restricted view of shamanism. Nonetheless, the framework his theory provides is capable of organizing both the clusters of practices and personal characteristics commonly found in shamanism. Most importantly, it offers a convincing explanation as to why they have consistently emerged across numerous cultures and generations. It is our hope that this brief attempt to incorporate previous relevant data into Singh's model will illustrate the full utility and applicability of the cultural evolutionary theory of shamanism for future research.

The cultural evolution of war rituals

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Abstract: The cultural evolutionary processes outlined by Singh illuminate why ritualized behaviors aimed at controlling unseen forces and overcoming fear are common in warfare among many small-scale societies. They also suggest an explanation for the development of ritual specialists for war who are distinct from war leaders.

Singh proposes a plausible account for the emergence of shamanism in which the desire of agents to influence events drives cultural evolutionary processes in domains with unpredictable, fitness-relevant outcomes. No other domain of behavior is perhaps costlier than warfare, which likely had large selective consequences in human evolution and for which success is often uncertain (Glowacki et al. 2017; Rusch 2014). Singh's account points the way toward understanding two features common to warfare in many small-scale societies: first, the prevalence of behaviors that are often ritualized and aimed at controlling unseen forces, enabling warriors to overcome fear; and second, the development of a class of ritual specialists for warfare that are distinct from war leaders and who often do not participate in conflict themselves.

The outcome of war is uncertain, and failure may result in the loss of one's life. Fear commonly accompanies anticipation of conflict, both in contemporary militaries and among warriors of small-scale acephalous societies (Bell 1935; Chagnon 1977; Goldschmidt 1994). Although cultural systems contribute to incentivizing participation (Glowacki & Wrangham 2013; Zefferman & Mathew 2015), humans also adopt superstitious beliefs and behaviors to overcome anxiety and fear and increase self-confidence. Warriors in numerous societies carry amulets or use drugs and alcohol to mitigate fear (Goldschmidt 1994). With astonishing frequency, many of these interventions purport to make enemies unable to see or harm the warrior. For example, Tanga warriors of Papua New Guinea who carried a sprig of ginger around their necks were "coated in a suit of magic armour which neither axe nor spears ... could penetrate" (Bell 1935, p. 269), and Lakota participating in the Ghost Dance who wore "spirit shirts" were bulletproof (Bearor 2011). Soldiers in the Democratic Republic of the Congo rub emollients on their bodies to "make the bullets bounce off them" (Gettleman 2012). Nyangatom warriors in Ethiopia preparing for battle blow smoke on each other, believing that the enemy will not see them (Glowacki 2015), while among the Pokot of Kenya, spells are cast on the sandals of warriors to make their tracks invisible (Bollig & Osterle 2007).

Saliently, many societies also have prewar collective dances (Goldschmidt 1994) such as the Maori Haka, now better known for its role in sporting events. These synchronistic dances often include acting out elements of combat such as mock shooting and fighting, and the lyrics frequently contain descriptions of previous exploits, the shame that befell cowards, or incantations for success such as "let all my enemies stand fixed ... Let my hand go ... true to the wounding" (Bell 1935, pp. 268–70). Among the Nyangatom and Toposa, some participants in war dances fall into a trance state that functions as a signal of the warriors' bravery and eagerness to fight. Although one outcome of group synchronistic activities may be group bonding or fusion (Tarr et al. 2014), another less conspicuous function may be heightened self-confidence (similar to the effect of superstitions), reducing the incapacitating effects of fear and making success in combat more likely.

Although behaviors such as carrying talismans and observing ritual prohibitions (including refraining from sex) may occur without the intervention of ritual experts, warfare is a domain in which ritual specialists distinct from shamans are common. For example, the Pokot seek out ritual specialists who bless their guns (Bollig & Osterle 2007), whereas among the Turkana and Nyangatom, ritual specialists sleep with rocks or bullets next to their head so the enemy will not wake (Glowacki 2015; Gulliver 1951). Unlike war leadership, which is common even in small-scale societies (Glowacki & von Rueden 2015; Glowacki et al. 2016), ritual leaders frequently do not accompany warriors to battle; instead, they provide interventions before and after combat. One striking difference between war ritual specialists and shamans is that the former in many societies do not have the barriers to entry that shamans do, including long initiations or non-human features. This shows that the uncertainty of war can drive the use of superstitious interventions and the emergence of specializations without key elements of shamanism, raising questions about what additional features mediate the cultural evolution of shamanism.

Because warfare can produce group-functional benefits, cultural evolutionary processes may be especially acute, driving increased selection for behaviors that appear to induce success. Success in war may contribute to the rapid spread of those traits within and between groups, which is one reason many war rituals look similar despite groups' diverse origins.

The success of war ritual specialists can also drive the evolution of social complexity toward increasing centralization and hierarchy. War ritual specialists usually collect fees or a share of the spoils (Ellis 1951; Lamphear 1994), contributing to their wealth and influence. Insofar as the group is successful because of the actual or perceived intervention of the specialist, this may influence the social organization of the society as the ritual leader amasses wealth and power (Brown 1979). For example, among the Turkana in the 1800s, ritual specialists held minor influence until the unprecedented success of Lokerio, a ritual leader in campaigns against neighboring groups. Turkana success alongside Lokerio's increasing wealth and influence resulted in the war diviner role becoming a powerful post and centralizing authority, "transforming his office into a new form ... whose authority extended throughout every section of Turkana" (Lamphear 1994, p. 74). This resulted in a new "collective identity" and "primordial nationalism" (Lamphear 1994, p. 88).

The cultural evolutionary processes outlined by Singh are informative for understanding the suite of cultural practices that accompany war across human societies. Superstitions and rituals can promote self-confidence, dampen fear, and improve the likelihood of success at individual and group levels. They also can support ritual specialization, which, in some instances, qualitatively shapes social complexity. When scaled up, these processes explain why some groups succeed where others fail, especially in the domain of intergroup conflict.

Do shamans violate notions of humanness?

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Abstract: Singh proposes that shamans violate notions of humanness in patterned ways that signal supernatural capacities. I argue that his account, based on a notion of humanness that contrasts humans with non-human animals, does not capture people's understandings of supernatural beings. Shamanic behavior may simply violate human

norms in unstructured, improvised ways rather than contrast with a coherent concept of humanness.

Part of Singh's intriguing analysis of shamanism rests on a set of claims about how shamans violate norms of humanness to convince people of their special powers. To do so, he argues, they "ostensibly transform into entities distinct from normal humans" (sect. 3.3, para. 1). That artifice persuades others that they have supernatural abilities to observe and manipulate unseen causal forces that go beyond those of ordinary people.

Singh suggests that shamans may "defy ... notions of humanness in patterned ways" (3.3.2, para. 4), but he leaves the nature of those patterns unspecified. Indeed, his speculations on the subject verge on contradictory. On the one hand, he cites Ojamaa (1997) to argue that shamans often present themselves as animal-like. On the other, he implies that shamans lack animalistic properties when he proposes that the supernaturalness they cultivate is associated with "possessing human-unique capabilities, like thought or self-control, while lacking those shared with animals, like hunger or pain" (ibid).

These two diametrical accounts each plausibly capture some of the shaman's special capacities, such as the ability to endure suffering and privation, and the capacity to apprehend things beyond normal human perception. The animalistic account can accommodate tolerance of pain or hunger as brute insensitivity or bestial strength. It can also understand heightened perceptual abilities as animal acuity; non-human animals often are seen as superior to humans in perception, although inferior in cognition (Haslam et al. 2008). (This pairing of animalistic strengths and deficiencies arguably accounts for the findings of Waytz et al. [2015] on the simultaneous dehumanization and superhumanization of black Americans.) The uniquely human account can frame shamanic endurance as exceptional self-control rather than insensitivity, and shamanic acuity as occult cognition rather than aquiline perception.

One problem with these two accounts of shamanic deviations from humanness, aside from being in opposition, is that they both place the human-animal distinction front and center. The research evidence, however, indicates that beliefs about the attributes of supernatural beings are orthogonal to that distinction. In the mind perception model of Gray et al. (2007), the mind of God differs from that of humans on a dimension of Experience independent of the Agency dimensions that distinguishes humans from other animals. God shares our capacity for higher cognition and self-control, which animals lack, but God lacks the affective and conative attributes (e.g., hunger, pain, desire, pleasure) that humans and animals possess. Similarly, Haslam et al. (2008) suggest that the mental states believed to differentiate humans from supernatural beings are distinct from those seen as differentiating humans from animals. Animals are viewed as outperforming humans on perception, but supernatural entities are not; supernatural beings are viewed as outperforming us on disembodied cognition, whereas animals are seen primarily as lacking human emotional refinement.

In short, it is not clear how the human-animal distinction can make sense of the ascription of superhuman abilities to shamans, either on the view that shamans present themselves as animal-like or on the view that they project themselves as having uniquely human abilities to unusual degrees. Although Singh's ethnographic evidence shows that shamans often use an animalistic idiom to express their strangeness, how that idiom leads others to ascribe supernatural powers to them remains obscure.

One possible alternative explanation is that shamans, in fact, do not defy notions of humanness in a patterned way. Rather than departing in a systematic fashion from a particular notion of humanness—for example, humanness understood as those attributes that distinguish people from other animals—shamans simply may violate behavioral norms in any way that conveys strangeness in their cultural context. This view of humanness