

# Magic, Explanations, and Evil

## The Origins and Design of Witches and Sorcerers

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Manvir Singh

In nearly every documented society, people believe that some misfortunes are caused by malicious group mates using magic or supernatural powers. Here I report cross-cultural patterns in these beliefs and propose a theory to explain them. Using the newly created Mystical Harm Survey, I show that several conceptions of malicious mystical practitioners, including sorcerers (who use learned spells), possessors of the evil eye (who transmit injury through their stares and words), and witches (who possess superpowers, pose existential threats, and engage in morally abhorrent acts), recur around the world. I argue that these beliefs develop from three cultural selective processes: a selection for intuitive magic, a selection for plausible explanations of impactful misfortune, and a selection for demonizing myths that justify mistreatment. Separately, these selective schemes produce traditions as diverse as shamanism, conspiracy theories, and campaigns against heretics—but around the world, they jointly give rise to the odious and feared witch. I use the tripartite theory to explain the forms of beliefs in mystical harm and outline 10 predictions for how shifting conditions should affect those conceptions. Societally corrosive beliefs can persist when they are intuitively appealing or they serve some believers' agendas.

**Online enhancements: supplemental material and tables.**

*“I fear them more than anything else,”<sup>1</sup> said Don Talayesva about witches. By then, the Hopi man suspected his grandmother, grandfather, and in-laws of using dark magic against him.*

### Introduction

Beliefs in witches and sorcerers are disturbing and calamitous. Sterility, illness, death, rainstorms, burned-down houses, bald spots, attacks from wild animals, lost footprints, lost reindeer races, the puzzling behavior of a friend or spouse—the enigmatic, the impactful, the bothersome—all can spark suspicions of neighbors using magic and dark powers; all can precipitate violence. The suspects are sometimes normal humans, learned in dark magic, but other times, they are rumored to be odious and other. They devour babies, fornicate with their menstruating mothers, and use human skulls for sports. They become bats and black panthers, house pythons in their stomachs, and direct menageries of attendant night birds. They plot the destruction of families and then dance in orgiastic night feasts.<sup>2</sup>

1. The quotation comes from the autobiography of Don Talayesva (Talayesva and Simmons 1942:379).

2. The quotes by Don Talayesva (opening) and the Santal guru Kolean Haram (“Existing Theories of Mystical Harm”) demonstrate that these beliefs are disturbing. The destruction mentioned in “Existing Theories of Mystical Harm” demonstrates that they are calamitous. Table 2 and “Accusations of Mystical Harm Track Distrust and Suspicions of Harmful Intent” describe the events that trigger suspicions of mystical harm. Table 3 features examples of animal transformations and attendants. Yamba witches were said to devour children (Gufler 1999), Apache witches had sex with menstruating family members (Basso 1969), Akan witches used human

Humans in nearly every documented society believe that some illnesses and hardships are the work of envious or malignant group mates. Hutton (2004, 2017) reviewed ethnographies from 300 non-European societies and documented pervasive beliefs in sorcerers, witches, the evil eye, and aggressive shamans. Of the 60 societies in the Probability Sample File (PSF) of the electronic Human Relations Area Files (eHRAF)—a pseudo-random sample of well-documented human societies—59 believed in some form of human-induced mystical harm, the only exception being the Kogi of Colombia (“Cross-Cultural Patterns”).<sup>3</sup> European societies have historically held similar beliefs, embodied in the Roman Strix (Oliphant 1913, 1914), the Saxon Striga (Cohn 1976), and, most famously, the witches of the Great

skulls for soccer (Debrunner 1961), and Santal witches met naked in nighttime assemblies, danced, and copulated with their spirit familiars (Archer 1974). Nyakyusa witches had pythons in their bellies (Wilson 1951).

3. The ethnographic texts included in the eHRAF did not describe mystical harm beliefs in two PSF societies: the Koreans and the Kogi. But researchers elsewhere have reported sorcery beliefs in Korea (Walraven 1980), so their omission seems due to ethnographers underreporting the topic. Meanwhile, Reichel-Dolmatoff (1976:286, 1997:141) explicitly stressed the absence of beliefs in mystical harm among the Kogi. Nevertheless, in describing Kogi lineages, he made a vague comment suggesting that people do in fact believe in mean-spirited, uncanny harm: “Both groups, the Hukúkui as well as the Mitamdú, are further regarded as vaguely dangerous and endowed with rather evil powers” (Reichel-Dolmatoff 1997:250).

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**Manvir Singh** is a Postdoctoral Research Fellow at the Institute for Advanced Study in Toulouse (1, Esplanade de l'Université, 31080 Toulouse Cedex 06, France [manvir.singh@iast.fr]). This paper was submitted 20 IX 18, accepted 4 II 19, and electronically published 25 II 21.

European Witch Hunt (Cohn 1976) and colonial New England (Karlsen 1987).

Beliefs about harmful practitioners are profoundly similar across vastly distant societies (Kluckhohn 1959; Needham 1978). The European witches of the late modern period were said to eat human flesh, engage in obscene activities, and assemble in conspiratorial, orgiastic nighttime gatherings (Cohn 1976). Similar behaviors were suspected of witches among the Yamba of Cameroon (Gufler 1999), the Santal of South Asia (Archer 1984), and the Navajo of the American Southwest (Kluckhohn 1944), among many other societies (Hutton 2017; Mair 1969; see “Cross-Cultural Patterns”). And just as people worldwide believe in sensational and atrocious witches, they also often suspect that sickness and death are the work of ordinary people secretly practicing dark magic (e.g., Trobriand Islanders: Malinowski 1922; Tswana: Schapera 1952; Niimiipuu: Walker 1967).

In this paper, I refer to people who are believed to use magic or supernatural powers to injure others as “practitioners of mystical harm.”<sup>4</sup> This term is broad, including, for example, beliefs about werewolves, abhorrent witches, people whose stares transmit illness, and neighbors who use voodoo dolls in secret. “Magic” refers to occult methods with instrumental ends, such as spells, curses, rites, manipulated objects, and everyday superstitions. Magic can be used to produce socially justified ends, such as healing people or succeeding in gambling, as well as less acceptable objectives, such as inducing illness.<sup>5</sup> I refer to harmful magic as “sorcery.” Methods of sorcery include cursing, stabbing voodoo dolls, and placing charmed poisons in people’s paths.

Sorcerers are people who use magic for malicious ends—that is, people who use sorcery. Witches, on the other hand, exhibit up to three sets of characteristics: (1) they are existentially threatening, (2) they have supernatural powers, and (3) they are morally repugnant. Some practitioners, such as those believed to both use magic and engage in activities like graveyard conspiracies and cannibalism, qualify as both sorcerers and witches. I justify these definitions in “Cross-Cultural Patterns.”

The ubiquity of mystical harm beliefs and their striking similarities raise two basic questions:

1. Why do humans believe in mystical harm?
2. Why do those beliefs take the form that they do?

This paper advances a tripartite theory to answer those questions. I propose that beliefs in mystical harm and beliefs

4. I use the term “mystical” to refer to harm that is transmitted through either magical means (e.g., spells, buried poisons, voodoo dolls) or supernatural powers (e.g., transforming into an animal and attacking someone, inflicting misfortune through an inadvertent envious stare). This usage follows Evans-Pritchard (1937), who contrasted mystical causation with natural causation, and Needham (1978), who defined a “witch” as “someone who causes harm to others by mystical means” (26), corresponding closely with my term “practitioner of mystical harm.”

5. Whenever I refer to the effects of magic (e.g., producing illness) or the features of a malicious practitioner (e.g., flying and eating corpses), I refer to beliefs about those traditions rather than actual consequences or traits.

about who orchestrates it are the result of three cultural selective processes:

1. *Selection for intuitive magic.* As people try to induce others’ misfortune, they selectively retain intuitive magic, producing compelling spells and charms for harming others. This produces intuitive harmful magic, but more relevantly, it convinces people that sorcery works and that other group members practice it.

2. *Selection for plausible explanations of misfortune.* People look for explanations for why things go wrong. When they feel threatened, they suspect distrusted group mates; when they believe in sorcery, it provides a straightforward explanation for how a distrusted rival harmed them from afar. Over time, iteratively searching for plausible explanations shapes beliefs about sorcerers to become increasingly compelling, although the same process can produce explanations that do not include sorcery, including beliefs about werewolves, the evil eye, and conspiratorial governments.

3. *Selection for demonizing narratives.* Actors bent on eliminating rivals devise demonizing myths to justify their rivals’ mistreatment. These campaigns often target and transform malicious practitioners, both because people suspect that malicious practitioners transmit harm and because individuals accused of mystical harm are easily demonized and abused.

On their own, these three processes produce beliefs and practices as varied as gambling superstitions, conspiracy theories, and vitriolic campaigns against heretics, but in societies around the world, they combine to produce the archetypal, odious image of the witch.

## Cross-Cultural Patterns

Researchers struggle over whether beliefs about harmful practitioners are similar across cultures. Many have emphasized commonalities (e.g., Kluckhohn 1959; Mair 1969), but others have criticized drawing these comparisons, one scholar concluding that “anthropologists have committed a possibly grave error in using the same term [*witchcraft*] for other cultures” (Crick 1973:18).

The most important effort in documenting cross-cultural patterns in these beliefs was conducted by Hutton (2017; see also Hutton 2004). Hutton reviewed ethnographies in 300 extra-European societies and identified five characteristics that malicious magicians around the world share with the early modern European conception of the witch. Namely, they tend to (1) cause harm using nonphysical, uncanny methods, (2) represent internal threats to their communities, (3) acquire their abilities through training or inheritance, (4) have qualities that incite horror and loathing, and (5) provoke strategies of resistance, including counterspells and murderous campaigns. Hutton also reviewed, among other patterns, similarities in witches’ heinous activities and the social conditions that inspire violence toward suspected malicious practitioners.

Hutton’s project was ambitious, but he sampled societies opportunistically, risking the overrepresentation of peculiar

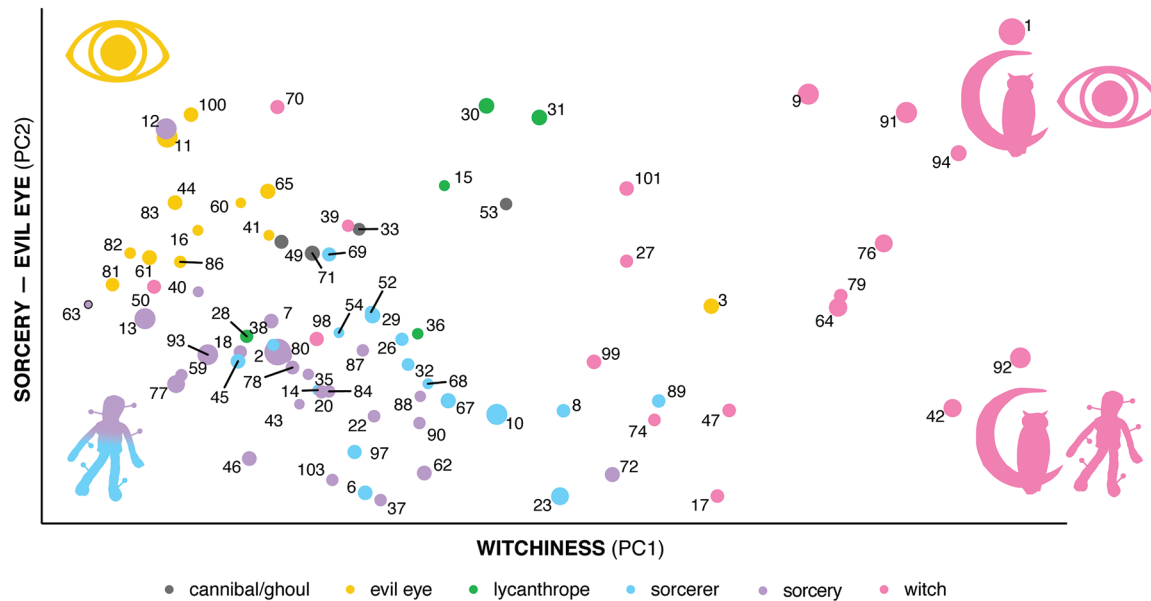


Figure 1. Results of a logistic principal component analysis (PCA) showing practitioners of mystical harm. A single point represents a belief about a practitioner in a society (such as the Trobriand flying witch or the Amhara evil eye); the accompanying numbers refer to the unique practitioner ID numbers (see supplemental table 1; supplemental tables 1–6 are available online). The points are colored according to the terms used by the ethnographer(s) who described them. They are scaled according to the number of paragraphs coded in that society, ranging from one paragraph (practitioner 63) to 1,976 (practitioners 1 and 2). The images refer to the features that characterize a given quadrant. Eye = evil eye (unintentional harm through stares or words); effigy = sorcery (learned magic); owl = witchiness (superhuman abilities, moral abhorrence, threat).

beliefs. He also chose not to systematically code traits such as how frequently practitioners are believed to kill people or associate with animals. These limitations prevented him from drawing strong inferences about how these beliefs compare around the world.

I designed the Mystical Harm Survey (MHS) to systematically capture beliefs about mystical harm in a representative sample of the world's societies. The data set covers the 60 societies of the Probability Sample File of the electronic Human Relations Area Files, a pseudorandom sample of well-documented cultures that were selected to make inferences about humanity more generally (see the supplemental materials, available online, for more details). The full data set is available at [osf.io/492mj](https://osf.io/492mj) and includes beliefs about 103 malicious practitioners (or practices) from 58 societies. The analyses reported here exclude leaders (e.g., elders, chiefs, senior lineages) and public magicians (e.g., shamans, priests) because these practitioners are public, institutionalized classes who advertise and perform their powers rather than simply being conceptions of group mates causing misfortune (including leaders and magicians in the analyses produces nearly identical results; cf. supplemental table 2; supplemental tables 1–6 are available online and supplemental table 4).<sup>6</sup>

I used a principal component analysis (PCA) to reduce the 49 raw variables in the MHS (e.g., Does a practitioner consume flesh? Do they cause economic harm?) to two derived variables

6. Hereafter, I refer to this restricted data set as the MHS and to the data set including leaders and public magicians as the expanded MHS.

(or principal components),<sup>7</sup> shown in figure 1 (for details, see supplemental materials). This method exposes the axes along which practitioners vary the most and, thus, the cross-cultural structure of these beliefs. Both of the derived variables are interpretable: the first dimension represents how witchy malefactors are; the second distinguishes sorcerers, as classically understood, from the evil eye.

Practitioners high on the first variable (PC1) are witches.<sup>8</sup> They are believed to kill people, cause illness, eat human flesh, desecrate corpses, use magic, fly, turn invisible, commit atrocities at night and in the nude, congregate in secretive meetings, transform into animals or use them as familiars, and engage in obscenities like incest and nymphomania; shamans and other magicians are often suspected of being witches (for loadings, see supplemental table 2). Practitioners low on this dimension lack these qualities. Contrary to many writers'

7. There are two reasons to report a two-factor solution. First, a scree plot (supplemental fig. 1, available online) shows a dramatic change in slope at the third component; after the second component, the additional dimensions explain equivalent and smaller proportions of variance. Second, the third component is uninterpretable (see supplemental table 3). The first and second components explain 23.1% and 16.8% of the total variance, respectively (39.9% in total).

8. Several variables, all of which appeared very infrequently in the MHS, had unstable loadings that collapsed when the data from a single region were excluded from the PCA (see supplemental materials, sec. 2.2, and supplemental tables 5, 6). I have not reported these unstable loadings here, but see supplemental table 2 for the full factor matrix.



impressions (e.g., Chaudhuri 2012; Mace et al. 2018; Sanders 1995), I did not find strong evidence that witches are more frequently women than men.

The second derived variable (PC2) separates everyday sorcerers from those who possess the evil eye. Practitioners low on PC2 use harmful magic, including spells, voodoo dolls, and magical poisons. They attack their neighbors and family members but sometimes target out-group individuals as well. Ethnographers often state that anyone can qualify as one of these practitioners, although men and public magicians are suspected more often. Practitioners high on PC2, in contrast, tend to possess the evil eye or blasting word: they harm people through their stares and comments, often inadvertently. Their powers derive from physiological differences, such as special eyes, rather than from learning specific methods or rites.

A surprising finding is that practitioners high on PC2 also tend to fly and eat human flesh. But this is less characteristic of the evil eye and more a feature of cannibals, ghouls, and lycanthropes (humans who transform into animals). In fact, no practitioner labeled “evil eye” by an ethnographer was said to fly or consume human flesh. Cannibals, ghouls, and lycanthropes likely appear with the evil eye in figure 1 because they all tend not to use sorcery (shifting them high on PC2) and they lack most other witchy qualities (shifting them low on PC1).

In figure 1, I colored the points according to the ethnographer’s name for that practitioner. These colors cluster, showing that terms like “sorcerer” or “witch” in fact capture cross-culturally recurrent beliefs. Sorcerers (blue) are normal humans

who use effigies, curses, and other spells to harm their rivals. Descriptions of sorcerers are very similar to descriptions of people generally knowing and using dark magic (purple). Possessors of the evil eye (yellow) harm people with their stares and words, often unintentionally. They do not employ spells, and their powers tend to be inborn rather than actively procured. Witches (pink) are much more variable across societies, but they share up to three sets of traits: (1) they are threatening (e.g., they kill and conspire in secret nighttime meetings), (2) they are supernaturally powerful (e.g., they fly and transform into animals), and (3) they are abhorrent (e.g., they consume human flesh and desecrate corpses; see fig. 2). These results of the PCA suggest that witchiness is a dimension rather than a discrete trait—that is, people in some societies describe practitioners who are more threatening, supernaturally powerful, and abhorrent than the practitioners described in other societies.

The analysis helps reconcile a historic debate about the difference between witches and sorcerers. Evans-Pritchard (1937) drew a strict boundary between the two, specifying that malicious practitioners are either normal humans who use magic (sorcerers) or different entities who do not use magic and instead attack with supernatural powers (witches). He used the dichotomous scheme to describe Azande beliefs in particular, but other anthropologists applied the same typology to different ethnographic contexts (e.g., Reynolds 1963; but see Turner 1964).

Figure 1 reveals that Evans-Pritchard’s witch-sorcerer binary does not generalize. Some heinous, supernaturally powerful



Figure 2. *Witches' Sabbath* (A; Goya, 1798; ©Museo Lázaro Galdiano, Madrid) and *Witches' Flight* (B; Goya, 1798; ©Photographic Archive, Museo Nacional del Prado) depict conceptions of witches held by many medieval Europeans. The witches are nude and nocturnal; they fly, kill babies, devour human flesh, associate with nighttime animals, and conspire with evil spirits. Despite their strangeness and particularity, these traits were not restricted to medieval European witches. People around the world—including the Tlingit (Pacific Northwest), Akan (West Africa), and Trobriand Islanders (South Pacific)—held similar conceptions of witches.

practitioners (witches) attack only with supernatural stares and thoughts, such as those of the Azande (9) and Akan (1), but many are believed to also employ spells, charms, and other material magic. Some witches, for example, stuffed effigies into the carcasses of dead puppies (Tlingit: De Laguna 1972:730); others recited spells to fly (Trobriand Islanders: Malinowski 1922:241) or used horseshoes and keys to conjure evil spirits (colonial New England: Karlsen 1987:9). Thus, witches resemble other malicious practitioners, such as sorcerers or possessors of the evil eye, except transformed along a dimension of witchiness, made more threatening, more abhorrent, and more supernaturally powerful.

### Existing Theories of Mystical Harm

The most influential theories of mystical harm ascribe a function to these beliefs, often regarding them as group-level adaptations. Most popular is the theory that these beliefs discourage socially unacceptable behavior. According to this theory, if people suspect that their irate neighbors will attack them with evil spells and powers, then people will refrain from upsetting each other, both to avoid being attacked by mystical harm and to avoid being accused (Beattie 1963; Walker 1967; Whiting 1950).

Faulkingham (1971) summarized this theory in observations of the Hausa (Niger): "Sorcery beliefs in Tudù provide people with strong motivations to be gregarious and to avoid quarrels. One is hesitant to be silent, alone, or bickering, lest he be accused of being a sorcerer. Further, people are reticent to exacerbate quarrels, for they may become ensorcelled" (112). But he also recognized that these beliefs entail major costs: "While sorcery beliefs have these social control functions, I believe that the villagers pay a high psychological price, since hostile emotions are relentlessly proscribed" (Faulkingham 1971:112).

Other researchers have echoed Faulkingham's second point, disputing cooperation theories by noting how sorcery and witchcraft beliefs sow distrust and provoke quarreling (Gershman 2016; see Hutton 2017:35 and works cited therein). Among the Kapauku Papuans, most wars in one region (Mapia) started because of presumed sorcery; in another (Kamu), sorcery accounted "for about thirty per cent of the conflicts" (Pospisil 1958:154). Other examples of contexts in which sorcery and witchcraft accusations bred violence abound (e.g., Gebusi: Knauff 2010; Rajputana: Skaria 1997; Yolngu: Warner 1958; Zulus: Bryant 1929). Suspicions of magical harm can even inspire vitriol among family members, such as when a Klamath woman slayed "her own mother for the fatal bewitchment of her child" (Stern 1965:21). An ethnographer quoted the Santal (South Asia) guru Kolean Haram, who summarized the sociological and psychological stresses of witchcraft beliefs: "The greatest trouble for Santals is witches. Because of them we are enemies of each other. If there were no witches, how happy we might have been" (Archer 1984:482).

Other scholars argue that beliefs in mystical harm explain misfortune. Evans-Pritchard (1937) famously proposed this

hypothesis in his report on Azande witchcraft. But the claim that witchcraft beliefs explain misfortune cannot account for many features of those beliefs. Most notably, why should people suspect that group mates engineer misfortune through magic or supernatural powers when they can already blame gods, water demons, and other purported invisible harmful forces? Addressing this gap, Boyer (2001) pointed out that we are predisposed to think about other people harming us. Humans are social animals, he observed, constantly engaged in reciprocal favors. Thus, he hypothesized, we have evolved psychological mechanisms that often interpret misfortune either as someone cheating us or as punishment for apparently cheating others. As people adopt or develop explanations that conform to these expectations, they produce beliefs in mystically powerful cheaters and cheater detectors: "People who give others the evil eye are overreacting cheater-detectors and witches are genuine cheaters" (Boyer 2001:200).

I borrow elements of the explanation hypothesis, but Boyer's formulation suffers from some of the same flaws as Evans-Pritchard's: both leave the content of witchcraft beliefs largely unexplained, including why people use spells or charms or why witches transform into animals and mutilate corpses. Boyer's account also confronts a problematic inconsistency: if people with the evil eye are "overreacting cheater-detectors," then why is the evil eye linked so often to envy (Dundes 1992), rather than to feelings of being cheated?

Finally, many researchers connect mystical harm beliefs to sociological events, such as the envy, inequality, and redistribution associated with social change (Bohannon 1958; Comaroff and Comaroff 1999), the control of women (Hester 1992; Natrella 2014), and scapegoating (Oster 2004). But these accounts remain atomized and disconnected. They focus on single determinants (such as rising inequality), most of which apply only in some circumstances, while failing to describe many of the features of mystical harm beliefs.

I have left out many other explanations for these beliefs, including ones that invoke repressed sexual impulses (Cohn 1976), distorted perceptions of existing or historic cults (Murray 1921), the inadvertent consumption of ergot fungi (Alm 2003; Caporael 1976), and delusions resulting from psychiatric illness (Field 1970). These accounts suffer from many of the same criticisms as those reviewed above. Not only do they fail to explain the content of mystical harm beliefs, but also they leave open the question of how shifting conditions should elicit some beliefs but not others.

### Introducing the Tripartite Theory: Cultural Selection

I propose that mystical harm beliefs develop from the interaction of three cultural selective processes. Cultural selection occurs when people preferentially retain particular practices or beliefs, such as because they appear to more effectively produce a desired outcome (Blackmore 1999; Boyd and Richerson 1985; Campbell 1965; Sperber 1996). For example, the cultural selection of effective killing technology occurs as people adopt

and maintain tools that kill animals or enemies. As people modify their tools and keep the effective versions, they iteratively fashion technology that is well designed for killing, like sleek spears or bows and arrows. Notably, cultural selection occurs whenever people use culturally transmitted practices for some desired end and they apply regular criteria to evaluate the effectiveness of those practices. Thus, selection can produce sleek killing technology, but it can also produce chairs, cheesecake, Disney movies, and other delights that satisfy people's desires.

Cultural selective processes are significant for two reasons. First, they produce complex traditions that no single individual could have devised in a single moment (Henrich 2015). But just as importantly (although less frequently appreciated), these processes retain those traditions. A spear, for example, may be used frequently yet remain unchanged for centuries. Although it does not evolve, people selectively retain it for assassinating game and enemies.

Many scholars assume that cultural selective processes are protracted, involving generations and many individuals, but they do not have to be. Yes, selective processes can occur over many generations: myths demonizing Jews, for example, evolved over decades as people throughout Europe borrowed and modified each other's existing productions (Cohn 1967). But cultural selection can also produce complex beliefs on very short timescales with many fewer participants, such as if several people concoct, maintain, and revise heinous myths about a feared subgroup in the hours or days following a catastrophe.

I propose that mystical harm beliefs develop from three cultural selective schemes that produce and maintain (1) intuitive techniques of harmful magic, (2) plausible explanations of misfortune, and (3) myths that demonize a subgroup. The three proposed schemes occur under different circumstances and frequently act independently of each other, separately producing superstitions, conspiracy theories, and propaganda. But they also interact and develop each other's products, giving rise to beliefs in sorcerers, lycanthropes, evil eye possessors, and abhorrent witches. In the following sections, I elaborate on each of these selective processes.

## Magic

Figure 1 shows that people in many societies suspect that their misfortunes are caused by others using sorcery. Why do people accept that sorcery works and presume that others practice it? Here, I argue that these convictions develop from a selection for intuitive magic. People adopt superstitions because of a predisposition to note spurious correlations between cheap actions (such as wearing special underwear) and important, unpredictable outcomes (such as winning a football game). As they then select among superstitions, they choose the most compelling ones, driving the development and maintenance of intuitive magic (see Singh 2018a for an expanded version of

this argument). As a consequence, people accept the efficacy of magic, including harmful sorcery, and understand that other group mates know it and might practice it.

### *The Selective Retention of Intuitive Magic*

*People adopt superstitions (magic) to influence significant outcomes that are important and unpredictable.* Rubbing rocks before giving speeches, wearing special underwear during football matches, blowing on dice before letting them roll—we regularly use superstitions to nudge uncertainty in our favor. Humans adopt magic or superstitions, which I define as interventions that have no causal bearing on their intended outcome, when those outcomes are important (roughly, fitness relevant) and occur randomly (Keinan 2002; Malinowski 1948; Ono 1987). Such outcomes include victory in war, the arrival of rain, recovery from illness, and rivals becoming sick, dying, or suffering economic losses. That we adopt superstitions to control these outcomes seems a result of a kind of bet-hedging psychology. When the costs of an intervention are sufficiently small relative to the potential benefits (like wearing special underwear to win a football match) and when the outcome seems to occur sometimes after the intervention, individuals benefit on average from adopting those interventions (Johnson et al. 2013; McKay and Efferson 2010). The predisposition to adopt superstitions to control uncertainty provides the basis for magical practices across human societies (Vyse 2014), including, I propose, magic for harming others.

*People selectively retain magical interventions that seem the most effective.* Magic should culturally evolve to become more apparently effective. Humans have intuitions predisposing us to regard some magical techniques, such as those with more steps and repetition (Legare and Souza 2012), as more potent than others. As magic users iteratively innovate and select these more effective-seeming techniques, they produce intuitive magic. People around the world share biases about how causality and efficacy work, so this selective process should produce cross-cultural similarities in magical techniques (e.g., Nemeroff and Rozin 2000; Rozin, Millman, and Nemeroff 1986), discussed below.

### *Ethnographic Evidence for Intuitive Magic*

At its basis, a selection for intuitive magic demands that people actually attempt to harm each other using magical means. It also predicts that magic will be effective seeming and that common intuitive principles will characterize both harmful magic and other superstitions. Both claims are supported by the ethnographic record.

*People attempt harmful magic.* People are notoriously reticent about discussing harmful magic with ethnographers, let alone admitting to using it (e.g., Ames 1959:264; Nadel 1954:164).



Nevertheless, researchers have successfully documented direct and indirect evidence of people using private sorcery. During his time with the Azande, Evans-Pritchard discovered two bundles of bad medicine in one of his huts. One was engineered “to destroy the popularity of the settlement where I lived by killing some people and making the rest afraid to remain there” (Evans-Pritchard 1937:402). The other was planted to kill the anthropologist. Richards (1935) examined the magical horns collected in a Bemba village during a witch-hunting movement in what is now Zambia. Although the vast majority were harmless medicine containers, “11 out of 135 horns were admitted by every one to be undeniably bad destructive magic, that is to say, prepared for the injury of others” (Richards 1935:453). Researchers report other examples such as these (e.g., Anglo-Saxon England: Crawford 1963; Wogeo: Hogbin 1938:231; Tlingit: Emmons and De Laguna 1991:410), although people’s admissions of using sorcery and even accounts of other people discovering evidence are difficult to interpret because of the possibility of deception.

Less contestable evidence of people using sorcery is the frequency with which specialists sell harmful services and magicians or laypeople perform evil magic to harm out-group enemies. Specialists sold harmful services in 26 of the 58 societies coded in the expanded MHS, while in at least 10 of those societies, practitioners used magic and supernatural powers to attack enemies of rival groups.

*Malicious magic is governed by the same intuitive principles as other kinds of magic.* The strongest evidence that magic, both harmful and otherwise, develops from a selection for effective-seeming practices is that all kinds of magic are governed by the intuitive principles of sympathetic magic. Sympathetic magic refers to two causal principles—the law of con-

tagion and the law of similarity (or homeopathy)—which guide magic around the world (Frazer 1920). The law of contagion refers to the implicit belief that “physical contact between [a source object] and [a target object] results in the transfer of some effect or quality (essence) from the source to the target” (Nemeroff and Rozin 2000:3). This principle covers contamination or pollution, in which a negative substance qualitatively changes a target object, as well as notions that acting on a part (e.g., on a lock of hair) can have an effect on the whole (e.g., the person who once owned it). That we wrongly but frequently believe in contagious magic seems in part a misfiring of psychological mechanisms evolved for noting contamination and illness transmission and perhaps an overinterpreting of the lingering effects of objects on each other (Apicella et al. 2018; Rozin and Nemeroff 2002).

In contrast to contagion, the law of similarity or homeopathy refers to the impression that “things that resemble each other at a superficial level”—like a voodoo doll that resembles a person—“also share deeper properties” (Nemeroff and Rozin 2000:3), for example, that acting on the doll produces effects on the imitated target. It remains unclear why people so habitually make this association, but as with the law of contagion, it likely reflects misfiring biases in causal reasoning.

Frazer (1920, chap. 3) famously documented examples of both contagious- and similarity-based magic around the world. Among his many cases of contagious magic, he noted that people often believe that one can affect a target by magically treating the impressions it leaves, such as footprints. Footprints feature in malicious magic, as when people tamper with a target’s prints to induce illness or pain, and in hunting magic, as when pursuers locate the tracks of animals and doctor them to slow the target (see table 1). Among his many examples of similarity-based magic, Frazer (1920) documented the frequent

Table 1. Malicious magic is governed by the same intuitive principles of sympathetic causality that structure other kinds of magic

Magical method	Examples of malicious magic (societies with references)	Examples of other magic (societies with references)
Treating the footprints of a target, such as to harm a person (malicious magic) or aid in the capture or warding off of animals (other magic)	Chero <sup>a</sup> Maori <sup>a</sup> Natinixwe (Wallace and Taylor 1950:189–190) Niimiipu (Walker 1967:74) Siwai (Oliver 1955:87) Tswana (Schapera 1952:45)	Ainu (Munro 1963:113) Azande (Lagae 1999:146–147) Fox (Jones 1939:23–24) Khoikhoi <sup>a</sup> Nlaka’pamux <sup>a</sup> Persians (Massé and Messner 1954:282)
Manufacturing and treating an effigy, such as to injure a target (malicious magic) or induce birth or drive away neighbors (other magic)	Ancient Egyptians (Budge 1901:75) Colonial New England (Karlsen 1987:8) Kenyah <sup>a</sup> Malay <sup>a</sup> Ojibwe <sup>a</sup> Sami (Karsten 1955:43–44)	Basotho <sup>a</sup> Egyptians (Ammār 1954:89) Inuit <sup>a</sup> Japanese <sup>a</sup> Nisenan <sup>a</sup> Pomo (Aginsky 1939:212–213)

<sup>a</sup> Examples documented by Frazer (1920).

belief that one can influence a target by creating and manipulating an effigy of it. Table 1 reviews examples of both malicious and nonmalicious magic that use effigies.

## Explanations

The selection of intuitive magic convinces people that malevolent magic is effective and that others practice it. How does this then transform into beliefs about sorcerers and witches who cause harm?

In this section, I propose that, under certain circumstances, people's hypervigilant tendencies lead them to suspect that group mates engineer inexplicable misfortunes. As they iteratively consider how those group mates harmed them, people maintain a selection for plausible explanations of misfortune. When they believe that sorcery is effective, people may suspect and develop beliefs about sorcerers, although they may consider other means of transmitting harm, such as animal transmutation, the evil eye, and even governmental conspiracies.

### *Selection for Plausible Explanations of Misfortune*

*People suspect distrusted group members in the wake of impactful negative outcomes.* Whether we lose a wallet or observe an epidemic sweeping through our community, we commonly attribute impactful, hard-to-explain events, especially negative ones, to the wicked intentions of other humans (Tennen and Affleck 1990). These tendencies seem to have evolved to vigilantly recognize threat (Raihani and Bell 2018). Our social lives are marked by conflict, so we benefit from tracing and anticipating when spiteful others harm us, even if it means making occasional mistaken attributions (see error management: Johnson et al. 2013; McKay and Efferson 2010).

A growing body of literature, most of it in the psychological sciences, shows that a person is most likely to suspect other people for causing some misfortune under four conditions: (1) the person feels threatened (Abalakina-paap et al. 1999; Mashuri and Zaduqisti 2015; Mirowsky and Ross 1983; Saalfeld et al. 2018), (2) they are distrustful of others (Abalakina-paap et al. 1999; Raihani and Bell 2017; van Prooijen and Jostmann 2013), (3) they confront an event that is hard to explain (Rothschild et al. 2012; van Prooijen and Douglas 2017; van Prooijen and Jostmann 2013), and (4) that hard-to-explain event is impactful (McCauley and Jacques 1979; van Prooijen and Douglas 2017; van Prooijen and van Dijk 2014).

These conditions are enlightening for two reasons. First, they provide evidence for adaptive hypotheses of paranoid thinking. People benefit from identifying mean-spirited rivals who conspire to harm them, so it is reasonable that our psychology has evolved to seek out these individuals when they are most likely to harm us. Second, identifying these conditions generates predictions for the contexts under which people are most likely to develop beliefs in mystical harm. If some adaptive psychological machinery provides a psychological foun-

ation for sorcery and witchcraft, then the conditions that trigger that psychology should in turn breed suspicions of mystical harm. I discuss these predictions in "Ethnographic Evidence for Plausible Explanations of Misfortune."

*People selectively retain plausible explanations for how group mates harmed them.* Humans constantly seek explanations (Frazier, Gelman, and Wellman 2009; Lombrozo 2006). When your money purse goes momentarily missing in a coffee shop and you suspect the waitstaff or your fellow patrons, you automatically consider the various ways that they might have accomplished their misdeed. You deem some explanations likelier than others—for example, that it was stolen once rather than stolen and returned and then stolen again or that it was stolen by the grungy crust punk rather than by the well-to-do suburban family to his left. The process of inferring an explanation by comparing hypotheses against each other and selecting the best among them is known as "inference to the best explanation" (Harman 1965).

People suffer many hard-to-explain misfortunes, such as illness, the death of a loved one, and a burned-down house. I propose that as they search for explanations for how suspected rivals engineered those harms, they retain the most plausible explanations. A distrustful person whose livestock dies, for example, will search for an explanation for how a rival committed the act. They will consider explanations that they have learned, concoct other stories, and ask knowledgeable group mates. As other people suffer similar inexplicable injuries and as people share their conclusions and suspicions with each other, communities spin more and more conceivable tales for how heinous group members abused them from afar. When people believe in the efficacy of malicious magic (following "Magic"), it provides a sufficient and parsimonious answer, easily accounting for invisible, distant harm.

In societies without strong beliefs in magic, this selective process still occurs, although it converges on different explanations. One explanation is that powerful governments mastermind misfortune. In his analysis on paranoia in US politics, Hofstadter (1964) noted that people often attribute their troubles to distrusted governments or the puppeteers controlling them, such as the Catholics, Freemasons, and Illuminati. Barkun (2013) showed that these theories evolve. The conspiracy theorist Milton Cooper, for example, tweaked and synthesized existing theories about the Illuminati, the CIA, the Kennedy assassination, observations of cattle mutilations, and the AIDS epidemic. His super-conspiracy theories comprehensively explained both the momentous and the puzzling, producing an unparalleled appeal. As I was writing this, his 1991 book *Behold a Pale Horse* (Cooper 1991) ranked 2,998th among all books on Amazon.com, besting the highest-selling editions of *The Iliad*, *War and Peace*, and *Uncle Tom's Cabin*.

Beliefs about mystical practitioners should evolve like contemporary conspiracy theories. Over time, they should become more internally consistent and plausible while encompassing a wider set of inscrutable events.



*Ethnographic Evidence for Plausible Explanations of Misfortune*

I have argued that beliefs in mystical harm develop to explain how distrusted group mates attacked a person from afar. At least two basic predictions follow: (1) beliefs in mystical harm should track distrust and suspicions of harmful intent and (2) malicious practitioners should be suspected of causing calamitous, negative events, especially ones for which people lack alternative explanations. Meanwhile, that these beliefs develop from a selection for the most plausible explanations clarifies why malicious practitioners often associate with, and transform into, animals.

*Accusations of mystical harm track distrust and suspicions of harmful intent.* People who suffer calamity overwhelmingly suspect individuals with a presumed interest in harming them. When several girls fell into possessed fits in Salem Village in 1692, many of the girls' families' political rivals were suspected of attacking the girls and their allies (Boyer and Nissenbaum 1974). Among the Azande, "a witch attacks a man when motivated by hatred, envy, jealousy, and greed. . . . Therefore a Zande in misfortune at once considers who is likely to hate him" (Evans-Pritchard 1937:100). For the Trobriand Islanders, "the passions of hatred, envy, and jealousy" are expressed "in the all powerful sorcery of the *bwaga'u* [sorcerer] and *muluk-wausi* [witch]" (Malinowski 1922:395). Many ethnographers studying other societies have made similar comments (e.g., Tlingit: De Laguna 1972:730; Tikopia: Firth 1954:114; Ona: Gusinde 1971:1102; Tukanos: Reichel-Dolmatoff 1971:156–157; Pawnee: Weltfish 1965:337).

People regard envy in particular as a potent, malicious emotion. Not only do they suspect that envious individuals want to harm them, but also in societies everywhere, people believe that the emotion itself transmits mystical harm, such as through covetous stares (the evil eye) or jealous compliments (the blasting word; Dundes 1992). Beliefs in the harmful effects of envy likely exist because, as experimental research demonstrates, envy drives malice. Individuals who experience envy are more likely to injure better-positioned targets (Miceli and Castelfranchi 2007; Smith and Kim 2007) and even derive pleasure when envied persons suffer (Smith et al. 1996; van de Ven et al. 2015). Thus, a person who expresses envy betrays a desire to harm, making them a key suspect after things go wrong.

The theory proposed here also predicts that beliefs about witches, sorcerers, and evil eye possessors should prosper in communities with lower levels of trust compared to those with higher levels. This explains why mystical harm beliefs increase with conditions that exacerbate distrust, such as growing inequality and the resulting rise in envy (e.g., Lederman 1981).<sup>9</sup>

9. Analyzing Pew survey data in 19 sub-Saharan African countries, Gershman (2016) reported a robust negative correlation between the prevalence of mystical harm beliefs and several measures of trust. He acknowledged that the evidence was correlational yet preferred the in-

*Mystical harm explains impactful and unexplainable misfortunes.* I argued that paranoid tendencies intensify when the impact of a misfortune is high and it is unexplainable. If beliefs in mystical harm develop from these tendencies, people should fault malicious practitioners for high-impact and inexplicable injuries.

People overwhelmingly accuse malicious practitioners of causing impactful hardship. Of the 83 practitioners or practices in the MHS, at least 78% were said to cause illness, 77% death, 30% economic trouble, and 16% catastrophes (such as hailstorms or epidemics). In total, 94% were reported as producing at least one of those outcomes.

Ethnographic descriptions often focus on the inexplicability of these hardships (e.g., Nsenga: Reynolds 1963:19; Kerala Brahmins: Parpola 2000:221). The Navajo attributed illnesses to witchcraft when they were "mysterious from the Navaho point of view" or "persistent, stubbornly refusing to yield to usual Navaho treatment" (Kluckhohn 1944:54). Other strange circumstances, such as the appearance of unexplained tracks, were taken as further evidence. When the Tiwi experienced a decrease in mortality from fighting, raids, and neglected wounds, they attributed the resulting increase in natural deaths to a rise in poison sorcery (Pilling 1958:123).

People attribute random calamities aside from death, disaster, illness, and material loss to mystical malice. Ten of the 83 practitioners in the MHS were said to produce sterility; 12 influenced love and attraction. Witches in colonial New England were rumored to cause clumsiness, falling, fires, forgetfulness, barrenness, deformed children, spoiled beer, storms, sleep paralysis, and unusual behavior in animals (such as a cow wandering off or a sow knocking its head against a fence; Karlsen 1987). Table 2 includes every example of harm or misfortune recorded in the MHS that does not qualify as death, injury, love, sterility, catastrophe, or economic trouble. Nearly all are inexplicable and bothersome.

*Animals associated with mystical harm explain impactful misfortune and invisible harm.* Those animals associated with malevolent supernatural practitioners provide further evidence that these beliefs serve as compelling explanations of misfortune. Table 3 displays all of the animals associated with harmful practitioners recorded in the MHS, separated into those animals believed to be transformed practitioners and those animals that act as their servants, steeds, or helpers.

A cursory glance reveals that many of the animals fall into one of two categories. First are those creatures responsible for calamities, such as human-killers and crop destroyers. Snakes, bears, tigers, wolves, and crocodiles all attack humans, leaving

terpretation that mystical harm beliefs erode trust. This is reasonable—people who understand illness and death to be the handiwork of evil group members should grow more distrustful of them—but the proposed theory also predicts the opposite direction of causality. As I discussed, people who distrust others should suspect them of causing unexplainable misfortunes, and sorcery provides a parsimonious explanation.

Table 2. Every example of harm or misfortune recorded in the Mystical Harm Survey (MHS) that does not relate to death, injury, sickness, love, sterility, catastrophe, or economic trouble (citations appear in the MHS data set)

Society, practitioner, <sup>a</sup> MHS practitioner ID	Harm or misfortune
Akan, <i>obayifo</i> /witch, 1	Accidents (including lorry accidents), bad behavior of wife, becoming a drunkard, burned-down house, cracks in buildings, ill luck, poor performance on school exams, pregnant men
Amhara, <i>buda</i> /evil eye, 3	Croaking or worsening of singer's voice
Aymara, <i>laiqa</i> /sorcerer, 8	Accidents, failure in fishing
Azande, <i>aboro mangu</i> /witch, 9	Burned-down hut, coldness of prince toward subject, failed magic, ruined performance of witch doctor, sulkiness or unresponsiveness of wife
Azande, <i>aira kele ngwa</i> /sorcerer, 10	Outcome of divination (poison oracle)
Azande, <i>irakörinde</i> /possessor of teeth, 11	Broken items, including stools, pots, and bowls
Azande, women's sexual magic, 12	Bad luck
Chukchee, sorcery, 22	Losing strength while wrestling, slowing down in a footrace or reindeer race
Chuuk, <i>souboud</i> /sorcerer, 23	Disturbed growth, falling or tripping during competition (basketball)
Dogon, <i>yadugonu</i> /witch, 27	Temporary muteness
Highland Scot, <i>buidseachd</i> /witchcraft, 40	Stuck or overturned truck
Hopi, <i>bowaka</i> /witch, 42	Malicious gossip, misbehavior of children
Iroquois, witch, 47	Confusion in sports competitions
Lau Fijians, raw eyes, 61	Skin discoloration (i.e., becoming tan)
Lozi, <i>muloi</i> /witch, 64	Inability to perform acrobatics, inability to score during football
Ojibwa, <i>windigo</i> /cannibal spirit, 71	Overturned canoes
Pawnee, witch, 74	Stopped rain
Santal, sorcery, 77	Deception
Saramaka, sorcery, 78	Boat accidents
Tarahumara, <i>sukurúame</i> /sorcerer, 89	Outcomes of competitions (e.g., races), twins
Tiv, <i>mbatsav</i> /witch, 91	Appearance of bald spots, bad dreams, burned clothes, "whatever goes wrong if there is no more convenient explanation"
Tlingit, land otter sorcery, 93	Disappearance

<sup>a</sup> Italicized name is the indigenous term for the practitioner or practice, followed by the ethnographer's term or translation.

wounded individuals searching for explanations. Hypervigilant people should immediately suspect their enemies, and ethnographic descriptions show that this frequently occurs. To the Akan, snakes bring "sudden and most unpleasant death," so "anyone who has a narrow escape from a snake comes to ask who sent it and why" (Field 1970:130). Archer (1984:486) recorded an incident among the Santal of South Asia when a man was mauled by two bears. He soon consulted a witch finder to learn who was behind the attack.

Another class of ruinous misfortune is the destruction of crops. The Akan accused witches of becoming squirrels, rats, crop worms, antelopes, bushpigs, cows, bulls, dogs, and red deer—but all of those suspicions followed incidents when those animals consumed or destroyed a person's harvest (Debrunner 1961).

The second major category includes those animals, such as owls, nightjars, flying foxes, and fireflies, whose alliance or transformation explains how dark practitioners commit their wickedness unseen. In all of these instances, people seem confident that a group mate harmed them and, noticing these animals flitting about, consider their appearance to be the missing explanatory piece for how a distrusted rival harmed them.

Several animals do not fall into the above categories, but their associations with malicious practitioners still seem to parsimoniously explain puzzling events. The Tlingit believed that witches could become porpoises and sea lions, but these suspicions occurred when those animals behaved enigmatically, lacking "the normal fear of human beings displayed by

ordinary wild animals" (de Laguna 1972:731). Thus, an ailing sea lion that remained near people's houses and porpoises that swam too close to shore were suspected of being metamorphosed witches.

Hyenas were associated with malicious magicians among the Wolof, Amhara, and Lozi, in addition to many cultures not included in the MHS, such as the Kaguru of Tanzania (Belderman 1975) and Persians in medieval India (Ivanow 1926). This association seems to be the result of demonizing narratives feeding back on plausible explanations. If people believe that certain individuals have superpowers and feast on human flesh (as shown in fig. 1 and discussed in the next section), they should start to suspect transformation when they witness nocturnal hyenas digging up corpses.

## Evil

The above two processes fail to explain the extreme heinousness of witches, such as their cannibalism and graveyard conspiracies. Here, I propose that these features develop from a selection for demonizing narratives—specifically, from a selection for those traits that justify the mistreatment of accused practitioners and even spur other group mates to remove them.

### *Selection for Demonizing Narratives*

*People promote demonizing narratives when they want to justify mistreatment of a group.* The cannibalism, conspiratorial

Table 3. Every example in the Mystical Harm Survey (MHS) of practitioners either transforming into animals (including the practitioner's soul entering or becoming an animal) or working with animals (including spirit familiars taking animal form; citations appear in the MHS data set)

Society, practitioner, <sup>a</sup> MHS practitioner ID	Animals into which practitioners transform
Akan, <i>obayifo</i> /witch, 1	Antelopes, bulls, bushpigs, centipedes, cows, crop worms, crocodiles, dogs, hyenas, leopards, lions, lizards, owls, rats, red deer, snakes (including poisonous ones), squirrels, tsetse flies
Amhara, <i>buda</i> /evil eye, 3	Hyenas
Azande, <i>aboro mangu</i> /witch, 9	Bats
Bahia Brazilians, <i>lobishomem</i> /werewolf, 15	Wolves
Dogon, lycanthrope, 28	Eagles, panthers
Eastern Toraja, <i>topokantoe</i> /sorcerer, 29	Snakes
Eastern Toraja, <i>taoe mepongko</i> /werewolf, 30	Buffalo, cats, deer, dogs, pigs, white ants
Garo, lycanthropy, 36	Any beast or reptile, including crocodiles, snakes, and tigers
Hopi, <i>bowaka</i> /witch, 42	Animals including coyotes, foxes, lizards, and wolves
Iroquois, witch, 47	Any animal, including dogs, pigs, turkeys, and owls
Kapauku, <i>meenoo</i> /cannibal, 53	Dogs, hawks
Lozi, <i>muloi</i> /witch, 64	Hyenas, lions
Mataco, <i>ayieu</i> /sorcerer, 68	Horses, jaguars, venomous reptiles (including rattlesnakes)
Santal, <i>tonhi</i> /witch, 76	Bears
Serbs, <i>vještice</i> /witch, 79	Insects, reptiles, sparrows
Tiv, <i>mbatsav</i> /witch, 91	Chicken leopards (?), crocodiles, foxes, leopards, lions, monkeys, owls, witch cats (?), other birds ( <i>akiki</i> , <i>kpire</i> )
Tlingit, <i>nukwsati</i> /witch, 92	Cranes, geese, owls, porpoises, sea lions
Trobriand Islanders, <i>yoyova</i> /flying witches, 94	Fireflies, flying foxes, night birds
Wolof, <i>doma</i> /witch, 101	Ants, cats, donkeys, hyenas, monkeys, owls, snakes, vultures
Animals associated with practitioners (e.g., familiars, mounts)	
Akan, <i>obayifo</i> /witch, 1	Antelopes, bats, chameleons, cocks, crabs, dogs, eagles, electric fish, goats, horses, houseflies, leopards, lions, lizards, lice, owls, rats, smart hawks (?), snakes (including black mambas, black snakes, green mambas, puff adders, pythons, spitting cobras, thrush striped snakes), soldier ants, tsetse flies, wasps, weaver birds, wolves
Amhara, <i>buda</i> /evil eye, 3	Hyenas
Aymara, <i>laiqa</i> /sorcerer, 8	Nighthawks, owls
Azande, <i>aboro mangu</i> /witch, 9	Nocturnal birds and animals including bats, jackals, and owls
Bahia Brazilians, <i>lobishomem</i> /werewolf, 15	Dogs
Bemba, <i>muloshi</i> /witch, 17	Magical birds, owl-like birds
Blackfoot, medicine, 18	Spiders
Chukchee, sorcery, 22	Dogs, reindeer
Eastern Toraja, <i>taoe mepongko</i> /werewolf, 30	Black cats, snakes
Eastern Toraja, <i>taoe meboetoe</i> /werewolf, 31	Black cats
Garo, lycanthropy, 36	Animals that live in the forest, including elephants, crocodiles, snakes and other reptiles, and tigers
Hopi, <i>bowaka</i> /witch, 42	Lizards
Lozi, <i>muloi</i> /witch, 64	Jackals, lizards, nightjars, owls, rats, water snakes
Ojibwa, witchcraft, 72	Snakes, wolverines
Pawnee, witch, 74	Owls
Santal, <i>tonhi</i> /witch, 76	Dogs, tigers
Serbs, <i>vještice</i> /witch, 79	Birds, insects, small reptiles, snakes
Tarahumara, <i>sukurúame</i> /sorcerer, 89	Invisible birds
Tiv, <i>mbatsav</i> /witch, 91	Cats, nightjars, owls, snakes
Tzeltal, witch, 100	Snakes

<sup>a</sup> Italicized name is the indigenous term for the practitioner or practice, followed by the ethnographer's term or translation.

meetings, and existential threat posed by witches are peculiar commonalities, but they are not unique. Sociologists studying moral panics and elimination campaigns in Western contexts have documented similar "folk devils," with target groups ranging from youth subcultures (Cohen 1972) to Jews (Cohn 1966, 1967). Their analyses, together with insights from psychological research, reveal why these narratives recur with such consistency around the world.

Folk demonization usually occurs because one group, hereafter, the Campaigners, wants to justify the mistreatment of another, hereafter, the Targets (Goode and Ben-Yehuda 2009). Targets can be social groups, such as Jews or heretics, but they can also be those people who engage in a particular behavior, like LSD users (Goode 2008).

Campaigners demonize Targets for several nonexclusive reasons, including (1) competition, such as when removing

Targets opens up resources, (2) existential fear, such as when Targets are believed to threaten Campaigners, and (3) moral campaigns, such as when Campaigners want to curb a certain behavior. The foundations of these motivations can be legitimate, like if removing victims frees up benefits that the Campaigners can enjoy (e.g., Philip IV's motivation to arrest the Knights Templar: Barber 2006), or mistaken, such as when Campaigners wrongly understand Targets to be threatening (e.g., panics about satanic groups: Victor 1989).

To mistreat Targets, Campaigners must often gain the approval of other group mates—hereafter, the Condoners. They can secure this approval by promoting sensational myths that justify abusing the Targets. People might craft these myths deliberately, as in many propaganda campaigns (e.g., Desforges 1999), but they can also do so unconsciously. People reflexively attend to and exaggerate evidence that supports their goals and their claims (Kunda 1990; Nickerson 1998), a tendency arguably designed to sway others (Mercier and Sperber 2011).

As Campaigners refine portrayals of Targets that justify and urge violence, they selectively retain demonizing narratives. The iterative crafting of heinous myths about Jews illustrates this process. For example, Cohn (1967) tracked the history of *The Rabbi's Speech*, a fabricated speech by a chief rabbi describing the Jews' plot to control finance and undermine Christianity. The speech started as a fictional chapter in an 1868 novel recounting a conspiratorial meeting between representatives of the 12 tribes of Israel and the Devil. In the years afterward, the chapter was borrowed, modified, distributed in pamphlets, and reprinted as purported fact. In an 1881 version from France, the many speeches had been consolidated into a single address, the satanic element was absent, and a note was included explaining that the document came from a forthcoming book by an English diplomat, vouching for its authenticity.

*Demonizing narratives develop and are maintained during stressful uncertainty.* For demonizing narratives to flourish, Condoners need to believe them. But this is often not the case because people are armed with cognitive adaptations that recognize and protect against deception (Sperber et al. 2010). In fact, ethnographers occasionally report people's skepticism about the existence or portrayals of evil magicians (e.g., Tswana: Schapera 1952:44).

Condoners should be gullible or credulous in at least two conditions. First, they should accept information when it comes from influential or trusted sources, such as religious authorities or the media. Second, and more relevantly, people should become receptive when they need valuable information, especially during times of unexplainable stress. Research on social learning and gossip shows that uncertainty, especially about important events, motivates individuals to pursue social information (Boyd and Richerson 1988; Laland 2004; Morgan et al. 2012; Rosnow 1991).

In conclusion, times of unexplainable disaster breed paranoid suspicion while leaving injured parties intensely credu-

lous. This combination of mistrust and gullibility allows fearful or exploitative campaigners to invent abominable witches.

#### *Ethnographic Evidence for Demonization*

*Witches are well designed to induce punitive outrage.* In "Cross-Cultural Patterns," I showed that witches exhibit many common features, two of the most striking being (1) their threatening nature and (2) their moral abhorrence, especially their cannibalism and defilement of human bodies. These behaviors ignite severe punitive ire, encouraging violence toward those actors.

Depicting a group as an existential threat—organized and secretive yet powerful and conspiratorial—is effective because, in short, people want to remove threats. A vast literature shows that people are more willing to invest in collective action when they feel existentially threatened (e.g., Berry 2015; Johnson and Frickel 2011; Maher 2010). Meanwhile, researchers note that people use past harms committed by a group to justify violence and mistreatment toward it (Sullivan et al. 2012) and people forgive aggressors when reminded of these wrongs (Wohl and Branscombe 2009). If narratives develop to maximally support and provoke violence toward demonized Targets, Targets should be portrayed as representing as large a threat as is believable.

Aside from conspiratorially plotting destruction, witches engage in atrocious behaviors, most frequently cannibalism and corpse desecration but also acts such as necrophilia (e.g., Navajo: Kluckhohn 1944) and incest (e.g., Apache: Basso 1969; Kaguru: Beidelman 1963). What accounts for their pervasiveness? As readers can attest, these acts trigger an intense, visceral moral outrage (Haidt, Björklund, and Murphy 2000). For the !Kung, "the two worst sins, the unthinkable, unspeakable sins, are cannibalism and incest" (Marshall 1962:229), while among the Comanche, "the very idea that one of them might under stress eat another person was vigorously repulsed" (Wallace and Hoebel 1952:70). In fact, the repugnance at cannibalism is so intense that some societies even claim to forbid the consumption of animals that resemble humans, exemplified in taboos on the Amazon River dolphin and nutria (a large semiaquatic rodent) among the Warao (Wilbert 1972:69).

One possible reason for our revulsion at acts like cannibalism and necrophilia is that they indicate that an actor is dangerous and not to be trusted. People may have evolved psychological mechanisms to select social partners who are predictable and safe. Any individual who even considers an atrocious behavior, like consuming flesh, having sex with dead bodies, or mutilating corpses, reveals an underlying preference that makes them perilous social partners (Hoffman, Yoeli, and Nowak 2015; Tetlock 2003). Our revulsion at these acts may be enhanced by feelings of disgust, which have been shown to heighten moral judgment (Schnall et al. 2008).

Regardless of why we abhor cannibalism and other obscenities, the broader point is that those acts invite severe punitive outrage, making them potent for justifying and urging elimination. Should some other set of behaviors provoke greater outrage,



Table 4. The targets of moral panics and elimination campaigns resemble witches, especially by posing existential threats and violating sacred values

Selected groups	Traits ascribed (with references)
Christians, 100s, Roman Empire	Worship a donkey god or genitals of priest; engage in secretive meetings, infanticide, child cannibalism, and nighttime incestuous orgies; “threaten the whole world and the universe and its stars with destruction by fire” (Felix and Rendall 1972:337–341)
Knights Templar, early 1300s, France	Deny Christ; spit, trample, and urinate on the cross; engage in homosexual practices, including disrobing newcomers and kissing them; collect in secret meetings at night; are bound by oaths enforced by death; swear to advance the Order at all costs, lawful or not (Barber 2006:202–203)
Fratelli de opinione (radical Christian sect), 1466, Rome	Enjoy nighttime orgies in crypts; sacrifice a small boy, make powder from his body, and consume it communally in wine during mass (Cohn 1976:46)
Catholics, mid-1800s, United States	“The anti-Catholics invented an immense lore about libertine priests, the confessional as an opportunity for seduction, licentious convents and monasteries. . . . Infants born of convent liaisons were baptized and then killed” (Hofstadter 1964:80–81)
Mau Mau rebels, 1950s, Kenya	Mutilate victims’ corpses; take secretive oaths at night that involve obscenities like public masturbation and drinking menstrual blood (Lonsdale 1990:398–400)
Communists, 1965, Indonesia	Murder, torture, and castrate generals; woman’s Communist group dances naked at night; plot nationwide purge of anti-Communists (Wieringa 2011; Henry 2014)
Tutsis, early 1990s, Rwanda	Send women to seduce Hutu and infiltrate positions of power; plot a war to reestablish control, massacre Hutu, and establish Nilotic empire across Africa; admire Nazis and engage in cannibalism; elders kill and pillage and rape girls and women (Desforges 1999:72–83)

the proposed theory predicts that witches will engage in those instead (assuming that people will believe the accusations).

*Witches resemble the demonized targets of other moral panics and eradication campaigns.* The traits of witches are sensational and atrocious, but they are not unique. Other panics and campaigns of mistreatment—such as attacks on heretics and dissidents, moral panics during times of stress, and conspiracy scares—similarly transform targets into witchlike demons. Table 4 lists some examples. Note how frequently these groups supposedly pose existential threats and violate sacred values.

## Discussion

### *The Origins of Sorcerers, Lycanthropes, the Evil Eye, and Witches*

Table 5 displays the three cultural selective processes hypothesized to be responsible for shaping beliefs in practitioners of

mystical harm. Figure 3 shows how those processes interact to produce some of the malicious practitioners identified in figure 1 (sorcerers, the evil eye, lycanthropes, and witches).

According to the theory outlined here, sorcerers are the result of both a selection for intuitive magic and a selection for plausible explanations. The selection for intuitive magic produces compelling techniques for controlling uncertain outcomes, including rain magic, gambling superstitions, and magic aimed at harming others, or sorcery. Once people accept that this magic is effective and that other people practice it, it becomes a plausible explanation for misfortune. A person who feels threatened and who confronts unexplainable tragedy will easily suspect that a rival has ensorcelled them. As people regularly consider how others harm them, they build plausible portrayals of sorcerers.

Beliefs about werewolves, werebears, weresnakes, and other lycanthropes also develop from a selection for plausible explanations. Baffled as to why an animal attacked them, a person suspects a rival of becoming or possessing an animal and

Table 5. The three cultural selective schemes responsible for beliefs in practitioners of mystical harm

Cultural selective scheme: What is being selectively retained?	Contexts: When should we expect it to occur?	Features of beliefs in mystical harm: Which features of mystical harm beliefs does this process produce?
Intuitive magic (sec. 5): effective-seeming interventions for harming or killing others	When people want to harm rivals	That harm can be transmitted through sympathetic means (contagion, similarity); that harmful magic is effective and that others do it
Plausible explanations (sec. 6): explanations for impactful misfortune	Following unexplainable, harmful misfortune, especially when people are distrustful or persecuted	That impactful and unexplainable harm is caused by magic and supernatural powers; that malicious practitioners are envious or offended; that they associate with animals, especially human-killers and nighttime or tiny animals
Demonizing narratives (sec. 7): narratives that justify and urge mistreatment of a target group	When influential individuals aim to remove a subgroup; during stressful uncertainty	That malicious practitioners are threatening (e.g., conspire, kill); that they violate sacred values (e.g., eat corpses)

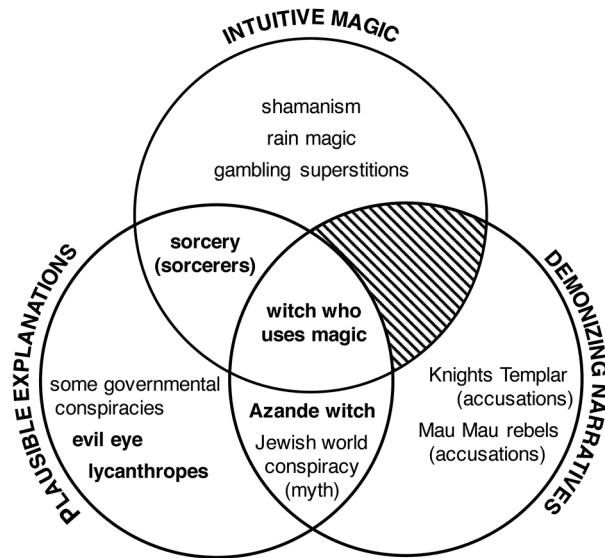


Figure 3. Shown are the three selective schemes responsible for beliefs in practitioners of mystical harm: intuitive magic, plausible explanations, and demonizing narratives. Practitioners of mystical harm are in boldface; examples of other practices and beliefs are in roman. The intersection of demonizing narratives and intuitive magic is filled because no beliefs should exist there—any demonizing narrative in which the target uses magic should also blame the target for terrible events, shifting them to the center.

stalking them at night. This explanation becomes more conceivable as the lycanthrope explains other strange events and as conceptions of the lycanthrope become more plausible. Many societies ascribe transformative powers to other malicious practitioners (see table 3), suggesting that people also suspect existing practitioners after attacks by wild animals.

Beliefs in the malignant power of stares and words likewise develop to explain misfortune. As reviewed above, people around the world connect jealousy and envy to a desire to induce harm. Thus, people who stare with envy or express a compliment are suspected of harboring malice and an intention to harm. A person who suffers a misfortune remembers these stares and suspects those people of somehow injuring them. In regularly inferring how envious individuals attacked them, people craft a compelling notion of the evil eye.

Why suspect the evil eye rather than sorcery? There are at least two possibilities. First, an accused individual may ardently vow not to know sorcery or to have attacked the target (see these claims among the Azande, both described in text [Evans-Pritchard 1937:119–125] and shown in film [Singer 1981, minute 21]). Alternatively, given beliefs that effective sorcery requires powers that develop with age, special knowledge, or certain experiences, it may seem unreasonable that a young or unexperienced group mate effectively ensorcelled the target. In these instances, the idea that the stare itself harmed the target may provide a more plausible mechanism.

The famous odious, powerful witch, I propose, arises when blamed malicious practitioners become demonized. People who fear an invisible threat or who have an interest in mistreating

competitors benefit from demonizing the target, transforming them into a heinous, threatening menace. Thus, witches represent a confluence of two and sometimes all three cultural selective processes.

In figure 1, I show that beliefs about malicious practitioners exist along two dimensions. The tripartite theory accounts for this structure. All of the practitioners displayed are plausible explanations of how group mates inflict harm. One dimension (sorcery, evil eye) distinguishes those explanations of misfortune that include magic (sorcerers) from those that do not (evil eye, lycanthrope). The other dimension shows the extent to which different practitioners have been demonized. In short, all beliefs about harmful practitioners are explanations; sometimes they use magic, sometimes they are made evil.

#### Ten Predictions

The proposed theory generates many predictions for how shifting conditions should drive changes in beliefs about malicious practitioners. I refer to several of these throughout the paper. Here are 10 such predictions (the sec. of the paper is noted in quotation marks when a prediction is discussed):

1. People are more likely to believe in sorcerers as sorcery techniques become more effective seeming.
2. People are more likely to ascribe injury to mystical harm when they are distrustful of others, persecuted, or otherwise convinced of harmful intent (“Accusations of Mystical Harm Track Distrust and Suspicions of Harmful Intent”).
3. The emotions attributed to malicious practitioners will be those that most intensely and frequently motivate aggression (“Accusations of Mystical Harm Track Distrust and Suspicions of Harmful Intent”).
4. People are more likely to attribute injury to mystical harm when they lack alternative explanations (“Mystical Harm Explains Impactful and Unexplainable Misfortunes”).
5. The greater the impact of the misfortune, the more likely people are to attribute it to mystical harm (“Mystical Harm Explains Impactful and Unexplainable Misfortunes”).
6. Practitioners of mystical harm are more likely to become demonized during times of stressful uncertainty.
7. The traits ascribed to malicious practitioners will become more heinous or sensational as Condoners become more trustful or reliant on information from Campaigners.
8. Malicious practitioners will become less demonized when there is less disagreement or resistance about their removal.
9. The traits that constitute demonization will be those that elicit the most punitive outrage, controlling for believability (“Witches Are Well Designed to Induce Punitive Outrage”).
10. Malicious practitioners whose actions can more easily explain catastrophe, such as those who employ killing magic compared with love magic, will be easier to demonize.

#### The Cultural Evolution of Harmful Beliefs

Social scientists, and especially those who study the origins of religion and belief, debate over whether cultural traditions

evolve to provide group-level benefits (Baumard and Boyer 2013; Norenzayan et al. 2016). Reviving the analogy of society as an organism, some scholars maintain that cultural traits develop to ensure the survival and reproduction of the group (Wilson 2002). These writers argue that traditions that undermine societal success should normally be culled away, while traditions that enhance group-level success should spread (Boyd and Richerson 2010).

In this paper, I have examined cultural traits with clear social costs: mystical harm beliefs. As sources of paranoia, distrust, and bloodshed, these beliefs divide societies, breeding contempt even among close family members. But I have explained them without invoking group-level benefits. Focusing on people's (usually automatic) decisions to adopt cultural traditions, I have shown that beliefs in witches and sorcerers are maximally appealing, providing the most plausible explanations and justifying hostile aims. Corrosive customs recur as long as they are useful and cognitively appealing.

### Acknowledgments

I thank Mia Charifson for research assistance and Steve Worthington at the Harvard Institute for Quantitative Social Science for statistical help. Nicolas Baumard, Ronald Hutton, Graham Jones, Ted Slingerland, Dylan Tweed, Max Winkler, Richard Wrangham, two anonymous reviewers, and members of the Culture, Cognition, and Coevolution Lab at Harvard University shared comments on the manuscript. Luke Glowacki provided detailed feedback on the manuscript. This paper and the ideas presented in it are much clearer as a result of his incisive suggestions. This research was funded by a graduate research fellowship from the National Science Foundation.

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## Comments

### Pascal Boyer

College of Arts and Sciences, Washington University, CB 1114,  
1 Brookings Drive, St. Louis, Missouri 63130-4899, USA  
(pboyer@wustl.edu). 23 VI 20

### Cultural Attractors and Mystical Harm: How to Extend and Refine Singh's Model

One major obstacle to the emergence of a proper evolutionary anthropology is the lack of systematic databases. Evolutionary biology developed on the basis of the vast accumulation of facts from natural history. In the same way, we badly need evidence for cultural variation and recurrent representations. So Manvir Singh should be commended for carefully documenting recurrent notions of mystical harm and witchery—a theme that all anthropologists know is of enormous social import in many human societies, yet is often explained in impressionistic terms.

Singh does much more than that in this target article, providing a statistical account of associations between the many

features of witchery/mystical harm notions, as well as a set of hypotheses about their psychological underpinnings. Taking these findings as a starting point, it might be relevant to ask how we could go further in accounting for this remarkable cultural phenomenon.

1. The results of principal component (PC) analysis are intriguing, as they suggest two components, glossed by Manvir Singh as “witchiness” (PC1) and “sorcery/evil eye” (PC2). It is of course slightly speculative to treat these as dimensions, but that is also hard to resist. Specifically, these may seem to correspond to two relevant dimensions of the ways harm doers are construed. In this view, PC1 would describe the extent to which cultural representations of the perpetrators include attention-grabbing elements such as supernatural, counterintuitive features, or salient norm violations (higher for “witches” and much less so for sorcerers). By contrast, it seems that PC2 charts the extent to which the agents are described as deliberate rather than unwitting vectors of harm. Evil eye is frequently described as involuntary—just feeling envy may make you a source of misfortune for others. Would Singh consider this a plausible interpretation?

2. Notions of witches, evil eye, sorcery, and more constitute cultural attractors, that is, positions in conceptual space that are more likely than others to be instantiated in cultural representations as a result of transmission and reconstruction (Claidière, Scott-Phillips, and Sperber 2014). These notions are perpetually reinvented and reshaped as a result of communication and inference, creating local as well as cross-cultural attractors (Morin 2016). A common interpretation for the occurrence of particular attractors across many cultures is that they “fit” (in a way to be defined more precisely) some intuitive expectations common to human minds (Sperber and Hirschfeld 2004).

In “Introducing the Tripartite Theory: Cultural Selection,” Singh writes that harm beliefs result from various “cultural selective schemes,” but it is not clear where those schemes reside. Do they consist of attractors, that is, mere probabilities of occurrence? Or are they more than that, being causal factors that influence the frequencies of specific cultural traits? That is very much what the rest of the discussion implies, describing the different schemes in terms of psychological dispositions, for example, for superstition, explanation of misfortune, and ostracism. In each case, then, claims concerning the cultural effects of a scheme crucially depend on how much strong and independent evidence we have for the various dispositions in question. Clearly, Singh is careful to avoid ad hoc stipulations here. Yet the model would benefit from a more specific description of the psychological processes involved. For instance:

3. Consider the disposition to seek what Singh calls “plausible explanation[s] for misfortune.” Singh is probably on the right track here, but we may need a much more specific psychological model before this cultural selection scheme can be considered explanatory. Singh describes these accounts of misfortune as “plausible,” which they certainly are, given specific cultural assumptions. As he describes it, people in a small-scale

community may “consider explanations that they have learned, concoct other stories [so that] . . . communities spin more and more conceivable tales for how” witches inflict misfortune on others. This description assumes that explanations become better as they are more widely circulated, which may well be the case (although we do not really have many empirical studies of the process), prompting the question, What guides this constructive and reconstructive process? Assuming that the stories get honed through transmission toward a local attractor, what psychological processes explain the specific position of that attractor in conceptual space? Singh does mention several psychological facts, for example, that humans “regard envy in particular as a potent, malicious emotion.” But that is unsatisfactory. We explain people’s belief that misfortune is caused by jealous witches as a result of their assumption that jealousy is an emotion that can transmit harm. But that latter assumption, surely, is a crucial part of mystical harm belief, something that the model should explain rather than consider the explanation.

4. This leads to a more general issue, to do with the use of psychology in the description of the cultural selection schemes. Singh makes use of psychological generalizations that seem plausible enough but are themselves left unexplained. To take the most central one, it is probably true that people everywhere want an explanation for whatever misfortune befell them. But why is that the case? We may all think of this urge as natural, but that is only because, as normal human beings, we share it. That is not an explanation. What evolutionary pressure would result in a mind that focuses on such questions? In what sense does this focus contribute to fitness? Assuming that we humans focus on past misfortune to avoid it in the future will make us fall from the pan into the fire. Now we must explain why human minds focus on aspects of misfortune that are clearly irrelevant to prediction and precaution. Thinking that your car crash was caused by your in-laws’ jealousy is not helpful at all.

The model needs more work, it seems. It is vulnerable to criticism, including my rather extravagant demands for more research, more psychology, more evolutionary modeling, and more, but that is because it actually says something precise and relevant concerning a crucially important social phenomenon, in contrast to many previous anthropological theories that were not even wrong, as physicists would say. We can anticipate much-needed progress in our models of mystical harm beliefs in evolutionary anthropology and psychology, stimulated by this splendid comparative work.

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#### Peter T. Leeson<sup>10</sup>

Department of Economics, George Mason University, MS 3G4,  
Fairfax, Virginia 22030, USA (pleeson@gmu.edu). 29 XI 19

### Harmful Magic, Helpful Governance

Singh explains the development of harmful magic “without invoking group-level benefits.” Suppose that his explanation is

10. I thank A. Fuente Añejo for stimulation.

correct. Harmful magic may still provide group benefits, and where it is prevalent, it probably does.

Just as a screwdriver can open cans although it was developed to drive screws, so can a belief or practice serve the group although it developed to please psychologies, explain misfortunes, justify hostile acts, or do anything else. Consider, for example, shamanism. According to Singh (2018a), shamanism, similar to harmful magic, develops from cultural selection for cognitively appealing superstitions—to gratify the mind, not serve the group. Nevertheless, as Singh (2018b) acknowledges, “Shamans likely provide benefits to clients or the group” (48). By the same token, so does harmful magic.

Belief in harmful magic enables a technology for governing the group: the expectation that members you have rankled will target you with such magic. It is wise, then, to try to avoid rankling members of your group and, when that fails, to resolve matters with those you have rankled. Belief in harmful magic practitioners who are evil—witches—extends this technology. It encourages participation in activities that are personally costly but that benefit the group, like partaking in group sanctions of problematic members and hazarding your life in combat with enemy groups. Perception of such parties as witches magnifies their perceived threat and hence your perceived payoff for contributing to actions against them. It also magnifies the deterrent to becoming a problematic group member or defecting to an enemy group, lest you be perceived as a witch.

These incentives have protected real and intellectual property rights (Leeson 2014a; Suchman 1989), enforced contracts (Leeson 2013a, 2014a), strengthened tax compliance (Leeson 2013b), resolved conflicts (Leeson 2014c), and supported social insurance (Posner 1980) in groups where harmful magic beliefs and related superstitions are prevalent. Alas, they are not the only incentives that harmful magic creates. Harmful magic, like conventional weapons, may be used for predation as well as protection, and witch beliefs that encourage participation in activities that benefit the group may also be exploited for personal gain at the group’s expense.<sup>11</sup> Thus, not only is harmful magic a source of property rights and public goods but also, as Singh stresses, “as sources of paranoia, distrust, and bloodshed, these beliefs divide societies, breeding contempt even among close family members.” A dubious governance technology, without question. Yet that technology’s effect on group welfare hinges on a different question that Singh ignores: Compared with what?<sup>12</sup>

Compared with a governance technology such as modern American government, harmful magic is “societally corrosive” indeed. American government, too, sometimes sows paranoia, distrust, and bloodshed (e.g., the 1992 Los Angeles riots), breeds division and contempt among family members (e.g., estate litigation), and even produces the odd “witch hunt” (e.g.,

11. For one (infamous) example, see Leeson and Russ (2018).

12. This question is critical to understanding seemingly suboptimal institutions in general but especially those based on superstitions. See, e.g., Leeson (2012, 2014b).



the Smith Act trials). Still, it governs vastly better than harmful magic.

Compared with a governance technology such as modern Liberian government, however, harmful magic fares differently. Liberian government is corrupt, dysfunctional, and often inaccessible (International Crisis Group 2006; Isser, Lubkemann, and N'Tow 2009; Leeson and Coyne 2012).<sup>13</sup> Might harmful magic—witch-hunting warts and all—govern better than this technology or no governance technology at all? Harmful magic does not need to govern well or even halfway decently to benefit the group; it just needs to govern better than the group's alternatives.

That is a low bar to clear when the group's governance options are severely constrained. Unlike harmful magic, the appurtenances of superior governance—adequate police forces, competent judges and lawyers, clerks, jailers, fine collectors, institutions to control these agents—require enormous resource outlays, and many of their costs are fixed. Thus, while wealthy societies can afford superior governance, poor societies cannot. Poor societies may skirt this constraint if they inhabit nation-states that provide superior governance and they have ready access to state institutions. But where nation-states provide lousy governance or such access is lacking, the governance menu for poor societies is short and grim: there are dubious governance technologies like harmful magic, and there are probably worse.

Which begs the further question: Where is harmful magic prevalent? If Singh's examples are representative, it is prevalent where the governance alternatives are probably worse than harmful magic. The societies in Human Relations Area Files' Probability Sample File are "tribal and peasant societies" (*Behavior Science Notes* 1967:81), in other words, societies whose governance options are severely constrained.<sup>14</sup> They are poor; further, most are located in dysfunctional nation-states or nation-states with governance that is hard to access.<sup>15</sup> Seventeenth-century Europe was poor and poorly state governed, too.<sup>16</sup>

Despite this, Singh describes harmful magic beliefs as ubiquitous. That may be true in one sense: a sufficiently large population is bound to contain some people who profess belief in most anything. What seems far more important, however, is variation in the prevalence and social significance of harmful magic beliefs, variation that I suspect is immense and tracks variation in the severity of societies' governance constraints. No doubt, some members of wealthy societies believe in harmful magic, but their share, I hazard, is comparatively small. Who needs sorcery when you have responsive police, reliable courts, and the rule of law?

13. This despite the nominal similarity of Liberian and American government.

14. The Probability Sample File excludes "modern, industrial societies" (Ember and Ember 2019), hence also the subset that is wealthy.

15. See the Fragile States Index (<http://fragilestatesindex.org/>).

16. See the Maddison Project Database (<http://www.rug.nl/ggdc/historicaldevelopment/maddison/>).

I have supposed that Singh's explanation of how harmful magic develops is correct. In fact, while I find his account fascinating, I am skeptical that social scientists can learn the psychological roots of people's beliefs. I am confident, however, that we can learn how people's beliefs affect their incentives and, therefore, behavior. The incentives that harmful magic creates and thus also its governance outcomes are seriously flawed. But they are probably less flawed than the alternatives amid severe constraints, and it is amid such constraints that harmful magic seems to be prevalent.

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### Ryan McKay and Richard P. Bentall

Department of Psychology, University of London, Royal Holloway, Egham, Surrey TW20 0EX, United Kingdom (ryan.mckay@rhul.ac.uk)/Department of Psychology, University of Sheffield, Cathedral Court, 1 Vicar Lane, Sheffield S1 2LT, United Kingdom. 12 XII 19

### Malign Magic and Delusional Belief

Singh presents a rich cross-cultural analysis of "mystical harm" beliefs. Here we briefly discuss the strengths of Singh's analysis, which addresses a form of human belief that is easily dismissed by Western readers as irrational. We then take up Singh's rejection of psychiatric explanations of mystical harm phenomena and use this as a springboard for considering some broader issues, particularly the relationship between pathological and nonpathological belief.

Singh observes that attributions about malign magic are found in "nearly every documented society" and goes on to explain this phenomenon in terms of cultural selection processes, by which beliefs are retained, elaborated, and propagated according to their apparent effectiveness in interpreting the world. Three such processes are identified, with all three being required for the belief in harmful magic: selective retention of intuitive magic that seems to "work," selection of plausible (other blaming) explanations of misfortune, and selection of demonizing narratives that stigmatize rivals in terms of negative traits. A strength of this analysis is that it leads to testable predictions that Singh enumerates, but it is also worth highlighting that beliefs are unlikely to be retained if they do not in some sense "mesh" with widely held cognitive dispositions (which may be biologically evolved or culturally entrenched).

If magical harm beliefs are the result of cultural selection, sustained at the individual level by cognitive biases, it is puzzling that these beliefs are not evident in the developed, industrialized nations. Singh hints at several points that conspiracy theories might be an analogue, and indeed there is now a considerable literature documenting how widespread conspiracist beliefs are in European and North American society (Brotherton 2015). However, as these beliefs concern how everyone is victimized by untrustworthy agents, a better analogue might be paranoid beliefs in which individuals believe that they are specifically targeted for victimization. Although paranoid beliefs are a common symptom of psychosis, there is compelling evidence that they exist on a continuum with

subclinical forms of suspiciousness about others' intentions (Elahi et al. 2017).

This observation raises the question of the relationship between pathological and nonpathological belief. In developing his account of mystical harm beliefs, Singh explicitly avoids invoking "delusions resulting from psychiatric illness." While we do not ourselves posit an equivalence between clinical delusions and culturally sanctioned beliefs in "malicious mystical practitioners," we believe that it is instructive to consider the parallels and differences between these phenomena (see Bentall 2018; Ross and McKay 2017, 2018).

Although standard diagnostic manuals provide scope for delusional beliefs to be shared among individuals (Arnone, Patel, and Tan 2006; Langdon 2013), this kind of sharing is rare, and patients with clinical delusions typically reject the beliefs of other deluded patients, even if the beliefs are similar (Rokeach 1964). Prominent theoretical models therefore explain clinical delusions in terms of endogenous deviations from normal cognitive processes, reflecting the prevailing psychiatric view that they are detached manifestations of underlying pathology (Radden 2011). Indeed, a disjunction between an individual's beliefs and those widely accepted in their sociocultural milieu may be precisely what renders them delusional (Bentall 2018; see Murphy 2013).

Consistent with this view, Bell, Raihani, and Wilkinson (2019) have recently argued that explanations of delusions should incorporate a role for coalitional cognition (Boyer, Firat, and van Leeuwen 2015). Other theorists have suggested that we can signal our benevolence to fellow group members by the kinds of beliefs we adopt and express (Kahan 2016; Levy 2019). In this view, beliefs are like tattoos or uniforms, markers of group membership. Indeed, holding steadfast to certain beliefs in the face of patently contradictory evidence (Schaffner and Luks 2018) may be the doxastic equivalent of taking part in a painful ritual, a costly signal of commitment to a cultural group on which one depends (Soler 2012; Xygalatas et al. 2013). In delusions, however, the incorrigibility is arguably not instrumental—it is not a means of sending adaptive social signals. Deluded individuals, in this view, cannot effectively marshal belief to negotiate social situations, and they also cannot exploit social information to calibrate their beliefs (Bell, Raihani, and Wilkinson 2019; Bentall 2018).

These differences notwithstanding, delusional and nondelusional beliefs may have much in common. An ironic fact: a failure to identify with social groups may be a key risk factor for the development of delusions (McIntyre, Wickham, and Bentall 2018), yet just as social relationships are a preoccupation for healthy individuals, most delusions are socially themed (Bell, Raihani, and Wilkinson 2019). We have already noted the obvious parallel between persecutory delusions and the beliefs in malicious mystical practitioners that Singh analyzes. A vivid example of such coextensive contents is provided by Connors and Lehmann-Waldau (2018), who report a Caucasian patient who believed that his penis had been stolen and replaced with someone else's (he cited reduced penile length as

evidence for this belief). The parallel with social epidemics of the belief that one's genitals can be magicked away by malicious practitioners is unavoidable (e.g., Ilechukwu 1992) and implies a homologous relation.

The analysis of any widely held belief system requires attendance to (i) the cognitive propensities that undergird the contents of the relevant beliefs (Miton and Mercier 2015) and (ii) the cognitive and cultural factors that determine the particular forms these beliefs take and their dissemination in specific groups (Mesoudi 2016). With regard to beliefs in malevolent practitioners, one might invoke a continuum of susceptibility to intentional agent explanations of anomalous experiences (e.g., fluctuations in penis size), itself underpinned by differences in cognitive style (Ross, Hartig, and McKay 2017). Absent a cultural schema of relevant malevolent practitioners (e.g., penis thieves; Bures 2016), only individuals at the extreme of this continuum of coalitional cognitive dysfunction (Bell, Raihani, and Wilkinson 2019) will develop full-blown persecutory beliefs (e.g., Connors and Lehmann-Waldau 2018), and without cultural scaffolding, these individuals will attract medical attention. In the context of cultural support for "malevolent agent" explanations, however, individuals across a larger portion of the continuum may adopt the belief, at which point relatively minor deviations from rationality at the level of individuals may generate serious pathology at the group level.

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#### Sarah Peacey and Ruth Mace

Department of Anthropology, University College London,  
14 Taviton Street, London WC1H 0BW, United Kingdom  
(sarah.peacey.13@ucl.ac.uk, r.mace@ucl.ac.uk). 6 XII 19

We welcome Singh's novel and intriguing use of quantitative methods to examine the phenotypes of practitioners of mystical harm. Singh's principal components analysis (PCA) demonstrates for the first time, in a systematic way, how the characteristics of possessors of the evil eye and witches are different but not distinct and are recurrent in diverse societies. Although there is a substantial body of work on witchcraft beliefs, mainly by social anthropologists and historians, there is so far only a limited amount of quantitative cross-cultural research on the subject. This is a useful contribution to this growing interest in the subject in the evolutionary behavioral sciences.

In terms of the tripartite theory that Singh proposes, we were unclear on how the selection for more credible-seeming magical techniques and particularly those of harmful magic would work in a practical sense. As Singh notes, the use of harmful magic is a difficult area to document or test with accuracy. For these beliefs to exist in populations, they must appear credible, and spurious causal connections, rituals, and a search for explanations also contribute to this. But we would query how necessary the performance of harmful spells and charms actually is in some societies with a fear of witchcraft, which includes strong fears of being accused. Although individuals do attempt to use black magic to harm others, as Singh

and ethnographers have noted (Mair 1969), this may not be necessary for accusations to take place or for belief in mystical harm to be widespread within certain societies.

It seems that “cultural selection” here means something almost the same as cognitive bias. We would place greater emphasis on the second and third processes of selection: plausible explanations of misfortune and demonizing narratives. While Singh is not commenting that those performing harmful magic are necessarily the same as those who are accused of it, documented accusations seem to be less preoccupied with the mechanism of witchcraft and more with the identification and motivation of the witch (e.g., Thomas 1971), for example, following conflict between the accused and the accuser. In numerous cases, it seems unlikely that “witches” have attempted to bring misfortune on others, such as with accusations documented against children, which frequently occur in specific contexts. There are instances when children are brought up by stepparents or distant relatives, and a witchcraft accusation may remove the need to provide for a burdensome individual (Cimpric 2010; Secker 2013). The same can be inferred from accounts in which the elderly are accused of witchcraft (Foxcroft 2017; Miguel 2005a). Accusations may provide (through their demonizing narrative) a convenient way of severing ties while protecting the reputation of an accuser: it may be better to be seen as expelling a heinous witch than a harmless but unproductive relative who is a drain on resources.

Witchcraft can also be conceived of as an unconscious, innate trait (e.g., McCulloch 1952), which illustrates, as demonstrated by Singh’s PCA, the tendency of supernatural beliefs to overlap with one another. Many of those accused of witchcraft unrelated to the evil eye are young, particularly in more recent years (e.g., Adinkrah 2011; Foxcroft 2017; Secker 2013). Similarly, evidence from a number of societies suggests that individuals with the evil eye are not thought to be particularly young (Chaudhuri 2012; Reminick 1974; Spooner 1970), but further research is required in this area. As mentioned above, often the plausibility of an individual’s ability to undertake harmful magic seems less important than the circumstances leading to accusations or suspicions (Sarah Peacey, unpublished PhD thesis).

It is also worth noting that when the distinction between sorcerers and witches, as originally observed by Evans-Pritchard in the Azande (1937), was investigated by subsequent anthropologists in a number of societies (Douglas 1967), it became apparent that the Azande’s precise distinction between the types of practitioner did not generalize to all cultures (e.g., Douglas 1967; Hutton 2017; Mair 1969; Thomas 1971).

We support Singh’s concluding observation that witchcraft beliefs are not a group-level adaptation. Mace et al. (2018) found no evidence to suggest that those accused of witchcraft were uncooperative. In some instances, individuals accused of witchcraft are described as antisocial in ethnographic accounts; this does not seem to apply to all cases (Sarah Peacey, unpublished PhD thesis). Witchcraft beliefs and accusations do not seem to us to operate as a mechanism for intragroup cooper-

ation. Instead, it appears that they are largely explained by their adaptive functions as a causal explanation for misfortune and as a means of removing competitors and burdensome individuals.

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### Robin Schimmelfennig and Michael Muthukrishna

Department of Organizational Behavior, University of Lausanne, Bâtiment Internef, CH-1015 Lausanne, Switzerland (robin.schimmelfennig@unil.ch)/Department of Psychological and Behavioural Science, London School of Economics and Political Science, Houghton Street, London WC2A 2AE, United Kingdom (m.muthukrishna@lse.ac.uk). 13 XII 19

### What Ultimately Predicts Witchcraft and Its Variation around the World?

Witchcraft and related beliefs, such as evil eye, are a normal feature of life for many across the world. Our scientific separation of these “supernatural” forces from the natural is arguably weird (Henrich, Heine, and Norenzayan 2010; Saler 1977), but since the proposed mechanisms that turn malicious intent into maleficent outcomes contradict our best understanding of how the world works, their persistence and ubiquity require explanation. Singh offers a compelling explanation building on known psychology, but because this explanation relies on universal psychology, it falls short of explaining why these beliefs have varied across societies and over time. Figure 4 (Winkler 2017) illustrates both how widespread these beliefs are and how much they vary. And as a range of studies (e.g., Gershman 2016; Mace et al. 2018; Schnoebelen 2009) illustrate, while witchcraft still affects everyday life in many places in Asia, Africa, South and Central America, Oceania, and even parts of south, central, and eastern Europe, many western Europeans, Americans, and Australians may have never even heard of evil eye. How do we explain this variation?

Here, we propose a cultural evolutionary theory to explain this cross-cultural and cross-temporal variation that forms part of our ongoing work on competition between scales of cooperation (Muthukrishna 2017; Muthukrishna et al. 2017). Evil eye in particular is a puzzling belief because it incentivizes people to reduce conspicuous consumption and other forms of status signaling (Dundes 1981) that would otherwise lead to influence, mating opportunities, and other social benefits. We argue that these beliefs can be rationalized as culturally evolved adaptations to different levels of resource availability that change the disparity in relative returns on competition (the ratio of payoffs between winners and losers; “disparity in relative returns”) and the different degrees to which wealth can be accumulated and protected (what we might call “property rights” as a shorthand). This explanation also helps explain why hunter-gatherers have relatively lower levels of witchcraft and evil eye beliefs and relatively higher levels of egalitarian norms (Boehm 2001; Cashdan 1980; Guenther 1992; von Rueden 2019).

The explanation is as follows: In all societies, people compete, and the returns on this competition lead to social benefits such as influence, mating opportunities, and offspring outcomes,

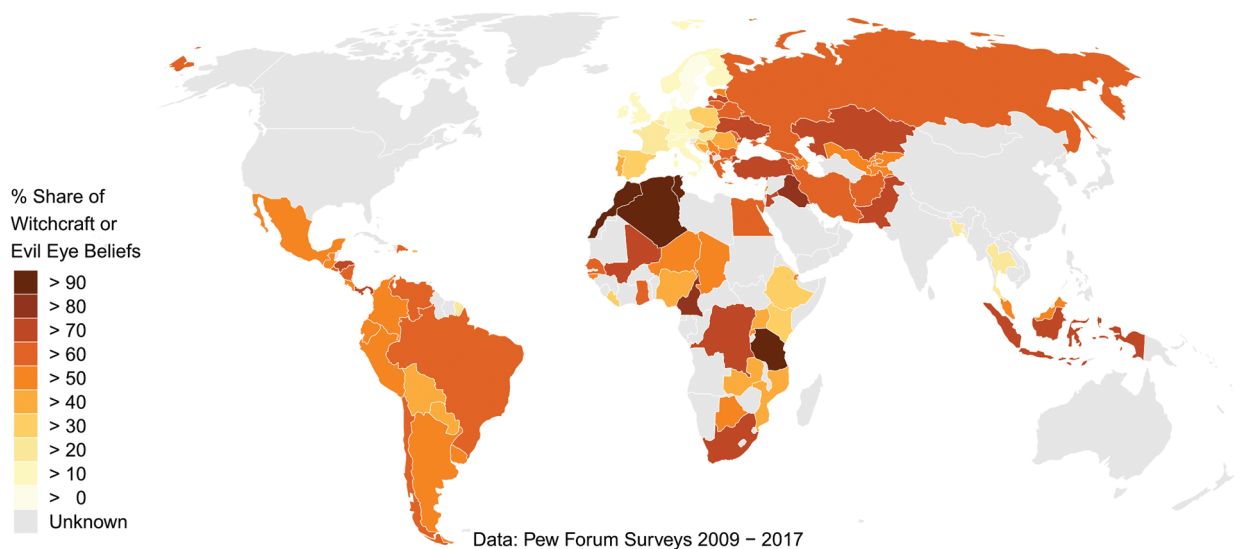


Figure 4. Shown are witchcraft and evil eye beliefs around the world (Winkler 2017) based on the Pew survey question “Do you believe in the ‘evil eye’ or that certain people can cast curses or spells that cause bad things to happen to someone?”

but the nature of that competition differs among societies. In some societies, the relative returns to winners compared with losers are much higher. For example, if resources are scarce and the world is more zero-sum, then one person’s success predicts another’s failure. The winner has taken a piece of a small pie that the losers can never get back. In contrast, if resources are plentiful, the world may be more positive sum, and one person’s success may be predictive of another’s success. For example, in a growing economy, if the coffee business is booming, you would do well to open a café yourself. The relative returns on this competition lead to differences in relative status and the pathways to relative status, in turn leading to different optimal behaviors. In the zero-sum world, harming others, even at a cost to oneself, may raise one’s relative status. In a positive-sum world, working harder to secure yet-untapped resources may be a more fruitful strategy. That is, the former incentivizes destructive competition and the latter productive competition. We see some evidence of this behavior in cross-cultural work on the Joy of Destruction game, in which players can destroy another’s endowment at a cost but with no direct benefit to themselves. The tendency to do this is much higher in Namibia than in Ukraine or the Netherlands (Abbink and Herrmann 2011; Abbink and Sadrieh 2009; Prediger, Vollan, and Herrmann 2014), and even within the Namibian sample, Prediger et al. (2014) show that pastoralists from more resource-scarce areas engaged in significantly more destructive behavior compared with pastoralists from high-yield areas. Connecting this to witchcraft beliefs, Miguel (2005) finds similar patterns in a positive relationship between extreme rainfalls (flood and drought) and witch killings.

The second dimension in our explanation is the level of property rights, the degree to which property can be accumulated and protected. A society with high property rights dis-

incentivizes destructive behavior. Many of these dynamics are captured by Gershman (2015, 2016), who also shows that witchcraft beliefs correlate with levels of competitiveness, property rights, and inequality and affect productivity and economic growth, human development, and social well-being. Gershman argues for evil eye beliefs as a culturally evolved mechanism for reducing conspicuous consumption and status signaling under conditions that incentivize destructive competition. Building on this reasoning, we argue that relative returns and property rights, which are a joint function of the environment and institutions, shape destructive versus productive competitive behaviors and furthermore behaviors associated with witchcraft and evil eye beliefs. We can derive the following predictions, which are stylized in figure 5.

To summarize our argument, evil eye is a culturally evolved mechanism reducing the temptation to advertise status in a world in which that higher relative status would incentivize destructive behavior. Witchcraft is an intuitive mechanism, as Singh argues, for representing the tendency of others wanting to harm the successful in unobservable ways to avoid retaliation. We predict that those with high or increasing status are more likely to suppress signaling their success under conditions of weak to moderate property rights and moderate to high disparity in relative returns. We further predict that harm will be directed at those with higher or increasing status and with whom we are in direct competition. Elon Musk sending his Tesla Roadster into orbit is cool, but my neighbor buying a Tesla is annoying. We have no specific prediction as to who will be perceived as a witch; however, we expect that within these same societies, witch hunts are triggered by factors that create unexpected inequality, such as heterogeneity in misfortune (or fortune). The destruction of everyone’s houses in a hurricane may increase destructive competitive behavior by



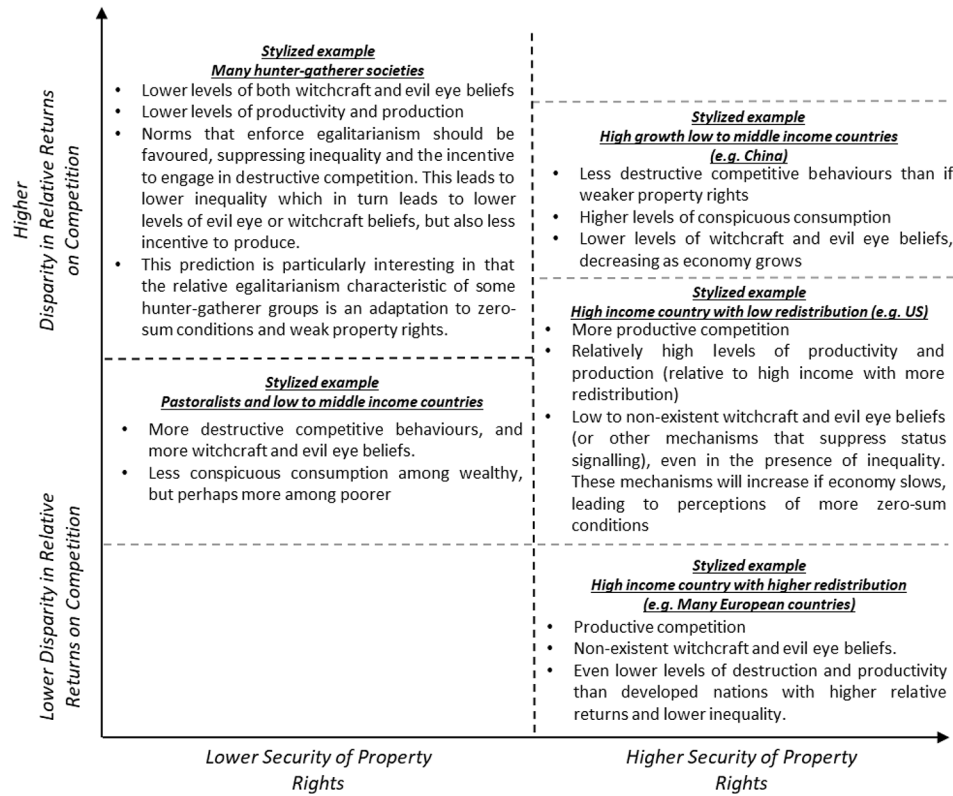


Figure 5. Shown are predictions for different disparities in relative returns and property rights mapped to stylized versions of different societies. Our identifications of different types of societies are only examples; the world is more complicated than the model. For example, there are hunter-gatherer societies with more accumulation of wealth and property rights and corresponding higher witchcraft and evil eye beliefs; within any nation there are differences in resource availability, disparity in relative returns, redistribution, security of property rights, and so on. Nonetheless, we do expect that this model can explain broad patterns.

creating a more zero-sum situation but is less likely to trigger a witch hunt than is the destruction of only a subset of houses. Rather than recognizing their place in a probability distribution, people target those who escaped misfortune or increased their fortune. Extending this argument, decreases in economic growth leading to increased inequality and increased resource scarcity (Piketty 2017) might lead to an increased perception of zero-sumness triggering relatively more destructive competition (tempered by the strength of property rights). We hope that this perspective offers an ultimate theory to complement Singh's fascinating argument and together explains both the existence of these beliefs and their variation.

## Reply

### Science, Delusion, Explosive Cockroaches, and Other Issues Surrounding Witchcraft and Sorcery

The commentators find value in the systematic comparison, beg for clarification, challenge empirical claims, propose alternative explanations, and, in one case, express skepticism about whether psychology can tell us much about the origins of be-

liefs. All agree that mystical harm beliefs are puzzling and important. All are enthusiastic and thoughtful. Thank you.

The commentators' many points can be organized into five broad questions.

### What Do the Principal Components Mean?

Boyer understands the two components of the principal components analysis (PCA) to be "relevant dimensions of the ways harm doers are construed." I agree. He writes that PC1, which tracks features like cannibalism, flight, and nighttime conspiracies, captures the extent to which representations of perpetrators are attention-grabbing. That differs from my interpretation, which is that PC1 represents how demonized a representation is, that is, the extent to which it inspires outrage and violence toward the accused. It is true that outrage-inducing descriptions are also attention-grabbing, but Boyer's interpretation raises a simple question: Why *these* attention-grabbing features? Lots of things, including torn scrotums, rats living in a person's anus, and cockroaches exploding out of a person's arm, grab attention (Heath, Bell, and Steinberg 2001), yet PC1 includes a particular set of features: heinous acts, supernatural powers, and threatening behaviors. Given that these also inspire punitive collective action ("Witches Are Well

Designed to Induce Punitive Outrage”) and that people level them at other despised subgroups (table 4), I favor the demonizing interpretation.

Boyer also writes that PC2 appears to distinguish deliberate from unwitting vectors of harm. I agree with this interpretation and add that deliberate harm is often tied to learned harmful magic, while unwitting harm is often tied to inherent traits.

### What Is Cultural Selection, and How Does It Connect to Human Psychology?

Two sets of authors (Boyer; Peacey and Mace) ask for clarification about the theory of cultural selection used in the article and its relation to cognitive biases. Cultural selection, as discussed in the article, is the mechanism by which cognitively attractive culture develops. As the taste designer Harold Markowitz observed, “The mind knows not what the tongue wants” (Gladwell 2004:130). Cultural products can be appealing, yet they still require a process of experimentation and exploration to be discovered. People have ends that they are motivated to achieve, such as attacking rivals, explaining misfortune, and spurring or justifying violence against subgroups. As they pursue these ends and preferentially adopt and pass on variants that seem to work best, they over time craft culture into forms evaluated as best achieving these desires. I have referred to this process—the selective retention of variants subjectively evaluated as best satisfying psychological goals—as subjective or evaluative cultural selection (Singh 2020).

### Do Some Aspects of the Tripartite Theory Lack Empirical Support?

Boyer writes that there is little evidence that explanations become “better” (e.g., more plausible) as they are circulated. In the article, I cited research suggesting that conspiracy theories become broader and more appealing with time (Barkun 2013), but I recognize that more work should be done.

Peacey and Mace question whether the fear of mystical harm really requires that people perform harmful spells and charms. Rather, they suggest, beliefs about witches and everyday sorcerers might develop mostly from the second and third processes (plausible explanations and demonizing narratives). Although I suspect that fears of evil sorcery will intensify when others actually use dark spells (prediction 1 in “Ten Predictions”), it is possible that beliefs in sorcerers can emerge and spread without anyone using magic. Even if this were true, the larger argument would hold: mystical harm beliefs develop not because of their individual- or group-level benefits but because they culturally evolve to satisfy ends that humans are motivated to achieve (explanation and demonization).

### Are Beliefs in Mystical Harm Group-Level Adaptations?

Peacey and Mace support my conclusion that witchcraft beliefs are not group-level adaptations. Yet two sets of authors

(Leeson; Schimmelpfennig and Muthukrishna) disagree. They argue that witchcraft beliefs promote group-level benefits and that such functional hypotheses should be taken seriously, especially because they can explain the decline of witchcraft beliefs among rich, educated, industrialized Westerners.

Echoing a long-standing anthropological literature (e.g., Whiting 1950), Leeson presents what we can call the good neighbor hypothesis: If people believe that others have dark powers, they are better behaved. They avoid offending others, and when they fail, they work harder to resolve conflict. Believing that wrongdoers are heinous, people are especially motivated to sanction them, and they are further deterred from acting badly to avoid being branded witches themselves.

I argued against the good neighbor hypothesis, highlighting that mystical harm beliefs just as often seem to undermine cooperation by sparking distrust and social schism. Leeson agrees that the beliefs have these effects yet contends that mystical harm beliefs are better than the alternatives, such as governments that are “corrupt, dysfunctional, and . . . inaccessible.” But the alternatives to witchcraft beliefs are not corrupt governments (or no governments at all). They are gods and local spirits. They are supernatural forces that punish bad behavior without sowing suspicion and ill will (Boehm 2008). The Mbuti of Central Africa described a forest being, *Toré*, who punished quarrels and disrespect by unleashing leopards, withholding game, and causing trees to fall (Turnbull 1965). The Mentawai people of Siberut Island, Indonesia, claim that a punitive water spirit attacks nonsharers—a belief demonstrated in their willingness to pay for costly healing ceremonies at the expense of other treatments (Singh and Henrich 2021). And the Saramaka of French Guiana expect that anything that triggers anger leads to retribution—not (just?) because the offended person uses evil magic but because their avenging spirit devotes itself to tormenting the matrilineal relatives and descendants of the offender (Price 1975). Societies seem capable of sustaining beliefs in moralistic supernatural enforcement without inciting the turmoil and paranoia characteristic of witchcraft beliefs.

Schimmelpfennig and Muthukrishna present a slightly different account that I will refer to as the smothered envy hypothesis. They argue that beliefs in mystical harm curb destructive behavior. In zero-sum contexts, they point out, people are motivated to destroy each other’s relative gains. The belief that envious people can transmit harm inspires rich people to hide their wealth, in turn reducing others’ motivation to destroy. You might want to smash my car if I flashily drive it around, but if I suspect that your envy can hurt me, I will hide the car away, conveniently removing your destructive impulse. The smothered envy hypothesis predicts that witchcraft beliefs should be most common in contexts where destructive behavior is most likely: particularly, those in which competition is zero-sum rather than positive sum and destructive behavior is most possible (“lower security of property rights”).

I commend the authors for outlining a hypothesis that makes clear predictions. And I agree that empirical evidence suggests that suspicions of mystical harm increase with rising local

differences in wealth (Comaroff and Comaroff 1999). But as currently formulated, the smothered envy hypothesis confronts two important limitations.

The first is that it is unclear why beliefs in mystical harm are required. Suppose that we live in a society ripe for the sort of destructive behavior Schimmelpfennig and Muthukrishna describe: Competition is zero-sum, and property rights are insecure. Any rich fellows who flaunt their things invite others to attack them. Do we really need beliefs in witchcraft and the evil eye? Or will people simply stop showing off their wealth once they learn that doing so invites trouble? People regularly engage in higher-order thinking to evade violence: They avoid certain neighborhoods. They walk with buddies and in lit streets. They carry weapons. They are quick to retaliate to maintain honorable reputations. Is the implication that they are capable of all of this, plus much more, yet they fail to realize that flashing their wealth invites violence and theft? This seems unlikely. As I currently understand the smothered envy hypothesis, mystical harm beliefs seem unnecessary.

The second limitation is that the mechanism of the hypothesis remains unclear. Suppose that a society rapidly transitions from positive sum to zero-sum. If beliefs in witchcraft shift soon afterward, as Schimmelpfennig and Muthukrishna suggest, how does this happen? One answer might be cultural group selection (CGS), but which mechanism of CGS is capable of such rapid adaptive change? Evidence from warring New Guinea groups suggests that interdemographic CGS occurs on the scale of hundreds, even thousands of years (Soltis, Boyd, and Richerson 1995). Migration-based CGS similarly seems too slow (Boyd and Richerson 2009). CGS by success-biased transmission might be fast enough (Boyd and Richerson 2002) but still seems unlikely: variation presumably needs to be generated rapidly enough to quickly produce beliefs in mystical harm yet also slowly enough that such beliefs stick around long enough to produce appreciable effects on group-level success. Another possibility is that influential leaders concoct group-functional beliefs (Singh, Glowacki, and Wrangham 2016; Singh, Wrangham, and Glowacki 2017), but it is unclear why they should so frequently rely on this particular means of stifling destructive behavior rather than on the other supernatural beliefs discussed above.

These are limitations of the group-functional accounts, but they are not insurmountable. I have spent so much space addressing these accounts because, as Boyer put it, those accounts aim to say “something precise and relevant concerning a crucially important social phenomenon.” Although I have been critical, I am excited at the prospect of sharpening and testing alternative explanations of mystical harm beliefs.

### Why Have Mystical Harm Beliefs Declined in Industrialized Western Countries?

Beliefs in mystical harm are still widespread and destructive (Forsyth 2016; Singh 2019). They are notoriously sticky (Legare and Gelman 2008). Yet as several commentators point out, they

are far less common in contemporary industrialized Western countries. Why?

Group-functional accounts attribute the decline in mystical harm beliefs to their no longer being useful (Leeson; Schimmelpfennig and Muthukrishna). But their decline coincided with a dramatic upheaval in worldviews, at a time when many beliefs apparently unrelated to cooperation also disappeared (Wootton 2015). Compare, for instance, an average educated Englishman in 1600 to one in 1733, two years before the English Parliament made it illegal to accuse someone of practicing witchcraft. According to Wootton (2015), the Englishman in 1600 believed not only in witches but also in werewolves, unicorns, alchemy, astrology, sympathetic magic, dreams as omens, rainbows as omens, the factual nature of *The Odyssey*, the spontaneous generation of mice in straw, and the tendency for murdered bodies to bleed in the presence of murderers. His 1733 counterpart believed in none of these. During the intervening years, a new epistemological tool kit—one that focused on direct experience and rigorous experimentation—developed and spread. The decline in mystical harm beliefs seems a result not of their shifting social value but of the scientific revolution and the corresponding transformation in how people evaluated information. This supports the point by McKay and Bentall that “beliefs are unlikely to be retained if they do not in some sense ‘mesh’ with widely held cognitive dispositions (which may be biologically evolved or,” critically, “culturally entrenched).”

Still, I agree with McKay and Bentall that analogues of mystical harm beliefs exist in industrialized societies today and that it is useful to consider the parallels between mystical harm beliefs and persecutory delusions in particular. The two are not equivalent, as they note, but the common fixation on malevolent intentions suggests shared cognitive underpinnings. McKay and Bentall write that shared delusional beliefs are rare, but, insofar as clinical delusions and mystical harm beliefs can shed light on each other, these seem the most informative case studies. Whether people suspect that their penises were stolen, that they have been impregnated with puppies (Chowdury et al. 2003), or that their lives are being broadcast on a reality television show (Gold and Gold 2012), a shared delusion must percolate through a network and, it seems, take a form that appeals to a wider swath of the population than does a solitary delusion. Shared delusions might clarify not just the cognitive foundations of mystical harm beliefs but also the social dynamics shaping their form and distribution.

—Manvir Singh

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