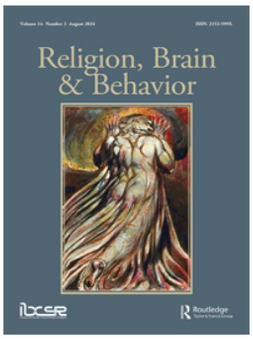

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God, witchcraft, and beliefs about illness in Mauritius

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ABSTRACT

Why do people use supernatural concepts to explain and treat illness? In a Mauritian sample, we examined how uncertainty around the cause of symptoms, illness severity, and knowledge about past moral behavior, influenced participants' tendency to attribute illnesses to God and/or witchcraft. We employed a preregistered vignette-based experiment to manipulate these variables in four illnesses and a combination of scaled and open-ended freelist questions about the causes and cures for each illness. Participants ($N = 530$) gave supernatural causes and cures for all illnesses. High uncertainty around the cause of the symptoms increased participants' claims that the illness was caused by God. When the sick person had a history of immoral behavior, participants were more willing to attribute their illness to God and witchcraft and offered up 4 times more supernatural causes in freelists compared with a person with no such history. We found no evidence that severity influenced participants' likelihood of suggesting supernatural causes or cures. Finally, when participants gave a supernatural cause, they were more likely to also indicate that the illness needed a supernatural cure (e.g., consulting a spiritual healer), suggesting that supernatural causes increase the need for supernatural cures.

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Introduction

Beliefs in gods, ghosts, spirits, and witches exist in human cultures around the world. One of the many roles these beliefs play is to provide believers with an explanation for why bad things happen, both to themselves and to others (Douglas, 1970; Evans-Pritchard, 1937; Gray & Wegner, 2010; Purzycki et al., 2021). As part of this, supernatural explanations for disease are common across societies (Lightner et al., 2023). Some examples are the tendency to explain the symptoms of malaria (O'Neill et al., 2015) or epilepsy (Obeid et al., 2012) as possession by a *jinn* or witchcraft. In the modern West, many people routinely engage with alternative medical and magical practices and beliefs (e.g., karma or energy flow) when dealing with health issues (Bryden et al., 2018; Lindeman, 2011). Supernatural beliefs are part of how people routinely understand the causes and cures of disease.

At the same time, people don't see *all* illness or misfortune as supernaturally caused even in societies that have strong supernatural beliefs. There is variation in when and how these supernatural explanations are used (Jackson et al., 2023). We examine what factors might influence people to conclude an illness is supernaturally caused, and if changing the circumstances of an illness can change the likelihood that people adopt supernatural causes. This approach enables us to test some

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more prominent theories on the origin of supernatural beliefs and how different conditions might influence the prevalence of using supernatural beliefs to explain the world.

We focus on the domain of illness because illnesses vary across the dimensions we are interested in; they can be mild or severe and their causes can be clear or inexplicable, making people uncertain about what is happening to them and what they can do about it (Hagger et al., 2017). Furthermore, throughout history and around the world people have attributed diseases to angry gods, evil spirits, and curses, and in turn treated disease with exorcisms, amulets, and prayers (e.g., Lightner et al., 2023). Given this frequency, the explanation of illness might be one of the natural domains (see Sperber, 1996) in which supernatural beliefs have culturally evolved (Gervais et al., 2011). Together, this makes the domain of illness an ideal place to examine how people are motivated to use supernatural beliefs to explain misfortune.

We are interested in the roles of uncertainty about causes, severity of a disease, and reputational information in increasing the use of supernatural beliefs. Specifically, will people be more likely to use supernatural explanations and treatments (1) if there are no clear explanations for the onset of illness, (2) if a disease is more serious or the symptoms harder to handle, and (3) if the sufferer is known to have behaved badly and therefore deserve punishment? We are also interested in if perceiving a supernatural cause will increase the rates at which people seek supernatural cures. We explain each of these, and the theory behind them, in turn.

Uncertainty

Malinowski (1922, 1954) was one of the first to articulate how uncertainty can lead to the belief in magic and religion. When people feel uncertain about important aspects of life—such as those relevant to survival—they may be more likely to hold on to supernatural beliefs to compensate for their feelings of a loss of control. In his work, Malinowski (1922) wrote about how the Trobriand islanders used religious rituals to deal with the unpredictability and risks of deep sea fishing. In contrast, predictable and low-risk inner-lagoon fishing had few rituals. He speculated that the rituals associated with deep sea fishing helped make the fishermen feel more in control when engaging in something that had otherwise unpredictable outcomes. Other work has since found that individuals use religious and ritual practices to cope with the high uncertainty among fishermen in New England (Poggie & Gersuny, 1972), baseball players (Burger & Lynn, 2005; Gmelch, 1992), American and Irish students taking tests (Felson & Gmelch, 1979), and women in a war zone (Sosis & Handwerker, 2011).

In psychological research, this idea can be related to compensatory control, which is defined as the belief that the world is non-random and can be controlled (Kay et al., 2009). The Trobriand islanders in Malinowski's description use ritual as a way to feel like they have influence over the things they cannot predict, returning some sense of control over things that are otherwise random and unpredictable. This is articulated in some of the work that tested Malinowski's ideas, which found the superstitious, religious, and ritual acts help practitioners gain back a sense of control when faced with unpredictable events (Burger & Arkin, 1980; Burger & Lynn, 2005; Poggie & Gersuny, 1972).

Work on compensatory control shows that when people feel a loss of control, they compensate with the belief that something else is in control, such as God (Kay et al., 2010). Thus, religion can play a key role in allowing people to either gain a sense of their own efficacy when faced with uncertainty or believe that some other divine being is in control. Other work has shown that when the cause of a misfortune is unknown, specifically when there is no person to blame, people are more likely to believe God caused their suffering (Gray & Wegner, 2010). In many cases, even when things are causally clear, they have random elements that people want to have some sense of predictability and control over. This is clear in work by Evans-Pritchard (1937), who found that the Azande use witchcraft beliefs to explain why random accidents happened to people—specifically to answer the questions of why certain individuals are affected at particular times, rather

than mechanistic questions of how the event occurred. Although we have a strong desire to answer these types of why questions, they are entirely uncertain and causally opaque—because most of the time there is no answer to why misfortunes befall some people and not others.

Here we focus on a specific type of uncertainty—that which is caused by causal opacity, or not understanding a cause of something important to us. This is particularly relevant in the domain of disease. Previous work has demonstrated that not understanding the causes of one's symptoms can lead to patients feeling out of control and therefore have worse outcomes (Hagger et al., 2017). This lack of understanding of the causes of one's symptoms increases the perceived unpredictability of a disease, which in turn causes stress and anxiety in the patients (Mishel, 1984). Symptoms of disease and their cause are often uncertain, and they are the type of questions we have a strong desire to solve.

We expect that when a person is presented with an illness with a high level of uncertainty they will be more likely to see that illness as supernaturally caused.

Severity

According to folk wisdom, when things get truly dire, we turn to God or other supernatural powers to seek our solutions. This is clearly articulated in the adage "there are no atheists in foxholes" (see Jong et al., 2012), suggesting that when life and death are on the line people are more likely to seek the comfort of religion (Sibley & Bulbulia, 2012). In a study looking at belief before and after the Christchurch earthquake in New Zealand 2011, Sibley and Bulbulia (2012) found that people who were affected by the earthquake were more likely to maintain religious belief than those who were not. Other research has confirmed these findings, showing the broad effects of natural disasters maintaining religious belief (Sinding Bentzen, 2019). Similarly, studies have found that combat exposure increases the likelihood of religious activity in servicemen (Cesur et al., 2020) and refugees (Van Tubergen et al., 2023). This can be taken as evidence that religious belief offers comfort when people face extreme challenges. In Malinowski's work outlined above, he found that alongside unpredictable fishing, the Trobriand islanders were more likely to use more elaborate rituals for more dangerous activities (also see: Poggie & Gersuny, 1972).

This relationship between suffering and religion has also led to some of the most prominent theories of religious decline. When people live in a society where much of their existential anxiety is removed through strong government services like healthcare and welfare (Norris & Inglehart, 2004), or through financial comfort (Storm, 2017), they are more likely to give up their religious beliefs. The theory behind these effects suggests that supernatural beliefs help us cope with suffering. This tendency is further evidenced by the reported relationship between religious belief and anxiety about death, where people who are made to think about death are more likely to endorse religious beliefs (Jong, 2021). This theoretical perspective has some support in formal mathematical models which suggest that when the benefits of a solution are high (e.g., not dying or becoming disabled from a disease), we should be more willing to try anything including more obscure or highly unlikely solutions (Foster & Kokko, 2008).

We predict that when illnesses are presented as more severe, people should be more likely to suggest supernatural causes. We also expect that this effect will increase with uncertainty, and the effects should be greatest when the disease is both severe and highly uncertain.

Reputation

Within the cognitive science of religion there is a rich literature linking religious belief to morality through the supernatural enforcement of moral and social norms (Lang et al., 2019; Norenzayan, 2013; Purzycki et al., 2016). This literature finds that "big" moralizing Gods—or Gods that will always know and care about what you do and punish you for your indiscretions—promote cooperative norms, even in anonymous situations where you are interacting with a stranger (Norenzayan

et al., 2016). On the other side, smaller local gods will also support moral and normative behavior, albeit often those of a more local concern and sometimes with limited power (Purzycki et al., 2021). For example, Singh et al. (2020) found that the Siberut Mentawai believe in local water spirits that will punish people with illness or even death if they do not share certain kinds of meat that were hunted or gifted with some uncertainty, but not other food or even other types of meat that were more reliably sourced (e.g., through agriculture). Similarly, Purzycki (2011) found that Tuvan spirit masters would punish transgressions that happened in the local area but would not know about and could not punish the same act if it happened far away and outside of their domain. Across this literature, supernatural beliefs have been found to routinely be related to the enforcement of normative behavior through beliefs about supernatural punishment, suggesting that this may be one of the primary roles of supernatural beliefs across cultures (Johnson, 2016; Purzycki et al., 2021).

For this to be true, people need to routinely link someone's past bad behavior to a current misfortune. This requires having reputational information about a person and believing that a current setback, injury, or illness happened as punishment for a previous transgression. Willard et al. (2024) have previously shown this relationship in Mauritius (also see Kundtová Klocová et al., 2022). They found that when a person violated norms associated with bragging or showing off (norms associated with causing envy), it increased the tendency of people to believe an otherwise unrelated misfortune was caused by witchcraft, and when a person behaved selfishly toward others, it increased the tendency of people to see a misfortune as caused by God. Together, this suggests that people should be more likely to think that an illness was supernaturally caused when they know the victim has done something bad in the past—this reputational information leads others to believe that the victim should be punished for their previous transgression and that their current misfortune could be that punishment.

We predict that people will be more likely to believe an illness is supernaturally caused when they know the sufferer has done something to deserve punishment. As with severity, we expect the effects of reputation to increase when paired with uncertainty so that a bad reputation and high uncertainty will be given the highest rates of supernatural causes.

Supernatural cures increase with supernatural causes

As well as supernatural causes, illnesses have supernatural cures. These cures may also increase in usage under the conditions listed above. In addition, supernatural cures come with another intriguing possibility: they will be employed more often if a person believes that an illness has been supernaturally caused. This would mean that when a disease is believed to be supernaturally caused, it may also be believed to need a supernatural cure.

We predict that when people suggest supernatural causes, they will also be more likely to offer supernatural cures.

Why Mauritius?

The multicultural and multireligious context of Mauritius, along with a prevalent belief in witchcraft and magic, offer an interesting opportunity to study how these beliefs are used to understand the causes and cures of illness. Mauritius is a small island nation in the Indian Ocean. It was uninhabited until it was discovered by Portugal in 1502. The first settlements were started by the Dutch in 1638 and it was subsequently occupied by the French and the British before becoming an independent country in 1968. The current population consists primarily of the decedents of enslaved people and indentured laborers brought in by these colonial powers.

The current majority ethnic group in Mauritius is of Indian origin (Indo-Mauritian), with a sizable minority of African origin (Creole), and a smaller number of Chinese (Sino-Mauritian) and European origin (Franco-Mauritian). Indo-Mauritians are predominantly Hindu with a sizable minority of Muslims, the Creole and Franco-Mauritian are largely a mix of Catholic and protestant

Christians, and the Sino-Mauritians are primarily Buddhist. At the edges of these religious traditions there are magic beliefs that borrow from all these religions, as well as some traditional African beliefs. Belief in witchcraft is prevalent across the island. Though these practices are considered taboo, they are widely practiced and these magical practitioners advertise across the island on bus stations, telephone poles, and the internet.

Mauritius has experienced rapid economic development in the past 50 years and has a rating of "highly developed" in the UN developmental index, putting it in the same category as Europe. There are multiple universities on the island and university education is free for Mauritians. Though the average level of education differs across generations, there is good access to modern medicine and medical knowledge throughout the population. Healthcare is free, and several private doctors also charge relatively affordable rates. There is a high rate of medical tourism in Mauritius with approximately 18,000 medical tourists showing up in 2018 alone (Amah & Nurse, 2018). There is a rich folk medical tradition, with local cures and herbal remedies widely available at markets and shops. There are also a variety of magic practitioners. "*Traiteurs*," or faith healers who employ magical practices to heal people, and "*longanists*" or witches who can cast or remove curses, along with a range of other offerings (Kundtová Klocová et al., 2022). *Longanists* are generally considered to practice black magic.

Current project

In this project, we looked at if high uncertainty, severity, and negative reputational information make people in Mauritius more likely to claim that an illness is supernaturally caused and might require a supernatural cure. We tested these ideas with a vignette experiment in which participants were read stories about a character suffering from a range of health-related symptoms. Across these vignettes, we varied the level of uncertainty—or more specifically opacity around the cause of the illness—the severity of the disease, and whether or not the character was known to have behaved badly in the recent past. This allowed us to test if uncertainty, severity, or reputational information increased the rate of supernatural beliefs around an illness.

Methods

Data were collected in Mauritius in 2022 and predictions were preregistered. All data and materials are available at https://osf.io/9vjpg/.

Participants

A total of 530 participants (47.81% female) were surveyed in Mauritius. The average age of participants was 43.14 years (range 18–82 years). Ethnicity was recorded as 202 Creole, 267 Indo-Mauritian, 3 Sino-Mauritian, 1 Franco-Mauritian, 47 other, and 11 missing. Of those in the "other" category 35 were written in as "Mauritian" with no additional classifiers.[1] For religion, we had 197 Christians, 231 Hindus (including 30 Tamil, 7 Telegu, and 10 Marathi), 70 Muslims, 7 Atheists, 24 other, and 8 missing. Of those in the "other" category, a majority of those that added additional context specified that they belong to a mix of more than one religion.

Materials

We constructed 16 vignettes representing 4 different medical issues: diabetes, epilepsy, dementia, and cuts/wounds on one's feet. None of the diseases were named in the vignettes: they were only described by common symptoms (see supplemental materials). Unlike the other issues, cuts on the feet are not a specific disease but can be caused by a variety of things from overly dry skin and injury to heart and circulation problems or diabetes. This was included to make sure we had at least one condition that was not easily recognized as a specific disease and maximized the

Table 1. Vignette conditions.

Conditions for Diabetes and Epilepsy		Conditions for Dementia and Cuts	
Low Uncertainty Low Severity	Low Uncertainty High Severity	Low Uncertainty Good Reputation	Low Uncertainty Bad Reputation
High Uncertainty Low Severity	High Uncertainty High Severity	High Uncertainty Good Reputation	High Uncertainty Bad Reputation

potential for uncertainty. These vignettes were designed based on interviews we did with medical professionals, religious figures, and lay people in Mauritius, and examples they gave us of the common health complaints and the reasons people give for these issues.

There were four conditions for each disease in a 2×2 design. For two of the illnesses (diabetes and epilepsy), the conditions were high and low uncertainty and high and low severity (see Table 1). For the other two illnesses (dementia and cuts), the conditions where high and low uncertainty, and good and bad reputational information. Each participant saw two disease vignettes, one high and one low uncertainty, and one from each of the severity and reputation conditions (e.g., a participant might see [1] high uncertainty + low severity and [2] low uncertainty + good reputation).

An example of our vignettes is:

> A man borrowed money from a friend when he was unemployed. Even though he now has a well-paying job and his friend needs the money he has not paid it back. Recently, the man has been finding many painful cuts on his feet in the morning. He has no idea why this is happening.

In this instance, the story was manipulated to demonstrate a bad reputation (the man was morally circumspect) and high uncertainty (the disease had no obvious cause). Contrast it with this version of the same story with no norm violation and a clear cause:

> A man borrowed money from a friend when he was unemployed. When he got a job he immediately paid it back. Recently, the man has been finding many painful cuts on his feet in the morning. It must be due to the new shoes he is wearing.

Participants were randomly assigned to condition by the survey software, and vignettes were presented in a random order.

The full list of vignettes and the Creole translations can be found with the preregistration, here https://osf.io/9vjpg/.

Outcome questions

As well as basic demographic questions, participants were asked three scaled questions and two freelist questions for each vignette. For the freelist questions, participants were asked to list up to 5 things that might have caused the characters' problems, and up to 5 things that could solve the characters' problem. These were open-ended responses and participants could say anything they like. Freelist questions were asked before the scaled questions. The scale questions aimed to assess three different types of causes.

1. The first asked if the cause could be the characters' "own fault" for neglecting their own health (Do you think [character's] problem was because he/she didn't take care of his/her body in the past? −3 to 3, very unlikely to very likely)
2. The second asked about God as a cause (Do you think [character's] problem was caused by God? −3 to 3, very unlikely to very likely).
3. The third indirectly asked about magic (Do you think [character's] problem happened because someone else harmed him/her? −3 to 3 very unlikely to very likely).

Though not mentioned directly, this third question would be widely understood to imply harm through witchcraft or evil eye in Mauritius. The use of "God" in the second question was easily

understood by Hindus. Hindus in this population typically believe that all Gods are aspects of one God, and that the term "God" in our translations refers to that one God.

Procedures

Each participant received two vignettes that included one high and one low uncertainty condition paired with one of the severity and one of the reputation conditions. This allowed for us to look at uncertainty within subjects and severity and reputation between subjects. Vignettes were limited to two per participant to allow for rapid in-person data collection. The order of the vignettes was randomized.

Data were collected by local research assistants who approached people in the streets and asked them to participate in a short survey. The vignettes and questions were read to the participants in Mauritian Creole and answers were recorded by the research assistants on a tablet computer (scaled questions and demographics) and on paper (freelists answers). Freelists were entered and translated into English by the research assistants who collected them. Translations and data entry were checked by one author (Nachita Rosun) who is fluent in Creole. Interviews took between 5 and 7 min per participant. Participants were not compensated.

Data coding

Freelists were coded in two ways. First, data was coded to retain as much of the existing variance as possible by simply grouping together causes/cures that were very similar. For example, "poor diet," "not eating well," "eating bad foods" would all be coded as the narrow category "diet." This is referred to as fine-grained coding in the analyses below. Two Mauritian coders who had participated in the data collection, but were blind to the condition, independently coded the data. There was high reliability between coders (Cohen's kappa for cause = 0.98, and for cure = 0.92). When coders disagreed, the final codes were decided by the first two authors.

These codes were then further lumped into broader categories by the first two authors. Here, all supernatural causes were categorized together as "Supernatural" and other items into other broad categories. For example, "God" would be recoded along with "karma" and "curses" as "supernatural" causes (see supplemental materials). The fine-grained coding was used for salience score analyses—a type of analysis that lets us account for both the frequency and the position in the list (i.e., how salient it is to participants) in ranking items. This allowed us to broadly map how people think about these illnesses. Salience scores were calculated using Smith's *S*. This is done by weighing items based on where they appear in the list (the first item is given a higher weight than the second, the second is weighted higher than the third, etc.). Individual item salience is calculated with the following equation:

$$i = \frac{n + 1 - k}{n}$$

Here, n is the total number of items in a participant's list, and k is the order in which that item was listed. Smith's S is calculated as the mean value of all items of that type (Smith, 1993):

$$S = \frac{\sum i_T}{N}$$

Salience scores were calculated using the AnthroTools package in R (Purzycki & Jamieson-Lane, 2017). The broad-category coding was used as count data (specifically, the number of supernatural items listed) in our regression analyses to test if any of our conditions increase the rates with which supernatural items are listed.

Results

We have divided our results by conditions, with a section for uncertainty, reputation, and severity. Within each section, we look at evidence from both the scaled questions and the coded freelist data. This allows us to present all the evidence for a given question together. Finally, we present evidence addressing the idea that believing in a supernatural cause increases the chance people suggest a supernatural cure. First, we will look at the rates of supernatural causes and cures for each disease. Participants who did not answer all relevant questions for a given analysis were excluded in a pairwise fashion from that analysis, thus participant numbers differ slightly in each analysis. Participant numbers for each analysis are included in all tables.

Rates of supernatural causes and cures across the sample

Across our questions there is substantial variability in how causes for different diseases where rated (Table 2). For all diseases, not looking after oneself ("own fault") was rated the highest. For our two supernatural causes, the harm caused by another (in this context widely interpreted as witchcraft) was more likely across all diseases than God, with witchcraft falling in the positive end of the scale. Witchcraft is, on average, rated as a slightly likely cause (for all diseases other than diabetes), and God is rated as a slightly unlikely cause.

When we look at the rate of supernatural causes and cures in the freelist data, we find a similar variability. Numbers are the average number of supernatural items in each list (for example, participants can list up to 5 causes for "cut" and across these lists, there is an average of 0.48 supernatural items per list). The average number of supernatural causes is highest for cut, and the average number of supernatural cures is highest for Epilepsy. Diabetes elicited the lowest number of both supernatural causes and cures.

The freelists for each illness, based on the fine-grained coding, followed a similar pattern. Both witchcraft and karma show up as salient items for cut, but none of the other diseases show any highly salient supernatural items (Figure 1). The terms "diabetes" and "epilepsy" were commonly identified as the causes of the illness in their respective vignettes (these terms were not used in the texts), with "diabetes" showing up as the most salient cause in any of the lists. This may partially explain the low number of supernatural items in the diabetes lists.

Prayer is identified as salient in all the cure lists other than diabetes (Figure 2). As well as these supernatural items, fixing the issue that led to the bad reputation appears in both reputation vignette cure lists (cut and dementia). This is returning the money borrowed from a friend and not paid back in the cut vignette, and fixing the personal relationships spoiled in the dementia vignette.[2] Even with these trends, the causes and cures offered are overwhelmingly natural and medical in nature, suggesting that these supernatural causes and cures are rarely the first ones that come to mind when speaking to a researcher.

Does more causal uncertainty result in greater levels of supernatural causation/treatment?

Analyses in this section were run as multilevel Bayesian models with weakly normalizing priors using the brms package in R (Bürkner, 2017). Models included random intercepts for participant

Table 2. Means and standard deviations of outcome question for each of the four illnesses. Average number of supernatural items in each freelist. Data ranges from −3 to 3 with negative numbers falling on the unlikely side of the scale and positive numbers falling on the likely side of the scale.

		Own Fault		God		Witchcraft		Supernatural causes Freelist	Supernatural cures Freelist
	N	Mean	SD	Mean	SD	Mean	SD		
Cut	264	1.81	1.79	−0.13	2.28	0.20	2.14	0.48	0.22
Dementia	263	1.21	2.15	−0.69	2.11	0.48	2.29	0.12	0.18
Diabetes	263	2.50	1.75	−0.74	1.98	−0.36	1.98	0.04	0.08
Epilepsy	268	0.49	2.06	−0.43	2.07	0.36	2.28	0.16	0.29

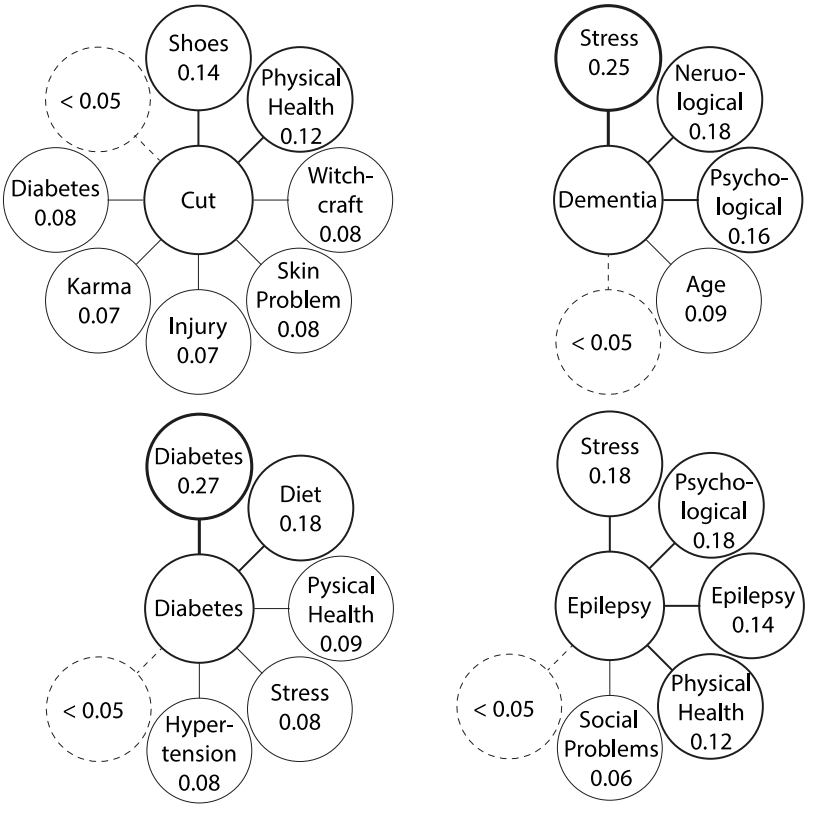

Figure 1. Salience of items listed in cause freelists using Smith's *S*. Line thickness of the circles is scaled in proportion to salience score.

and fixed slopes.[3] This allows us to account for the clustering caused by the non-independence of data within each participant's set of answers (two per participant). The illness presented in the vignette, as well as age, gender, and religious group were included as additional variables in all models (see supplemental materials for models with and without these additional variables).

We found no effect (and did not predict an effect) of uncertainty on ratings of the illness being the character's own fault (not taking care of themselves physically), and mixed results for our two supernatural questions (Table 3). When we look at the ratings of the illness as caused by God ("God" in Table 3), we see an increase in ratings when uncertainty is high (*est.* = 0.17, *95%CI* [0.03–0.31]). For the question about witchcraft, we do not see the same increase when uncertainty is high ("Other" (witchcraft); *est.* = −0.02, *95%CI*[−0.23 to 0.19]). Looking at the diseases individually (Table 4, Figure 3), it is clear that there is a lot of variation in these effects across diseases, with dementia showing no effect of uncertainty for belief in God, and the cut vignette showing an unreliable effect of uncertainty for witchcraft (see full analyses in the supplemental materials).

We analyzed the number of supernatural causes and cures given in each list across conditions using a Bayesian Poisson regression (Table 5). Results are presented as Incidence Rate Ratios (IRR) and can be interpreted as the average increase in the number of supernatural causes/cures in one condition compared to another (i.e., high compared to low uncertainty). Negative effects are indicated by IRRs of less than 1 (i.e., less than one item in one condition for every one instance of an item in the other condition). We see a slight increase in supernatural causes with high uncertainty—an average of 1.24 items in the high uncertainty condition for every 1 in the low uncertainty conditions—but this is not reliably estimated (95%CI[0.92–1.68]). We see no corresponding increase for supernatural cures. Again, when we look across diseases (Table 6;

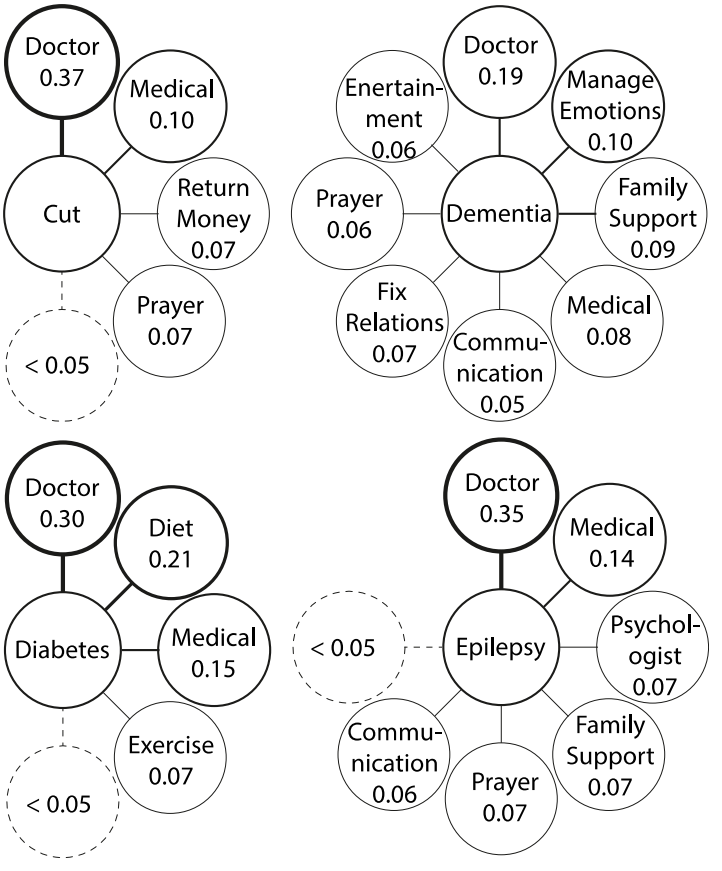

Figure 2. Salience of items listed in cure freelists using Smith's *S*. Line thickness of the circles is scaled in proportion to salience score.

Table 3. Cause ratings for the three outcome questions predicted by uncertainty (−3 to 3).

	Own fault		God		Other (witchcraft)	
Predictors	*Est.*	*CI (95%)*	*Est.*	*CI (95%)*	*Est.*	*CI (95%)*
Intercept	1.73*	1.39 to 2.07	−0.64*	−1.00 to −0.27	0.57*	0.21 to 0.94
Uncertainty (vs none)	−0.02	−0.25 to 0.21	0.17*	0.03 to 0.31	−0.02	−0.23 to 0.19
Dementia (vs cut)	−0.61*	−0.94 to −0.27	−0.53*	−0.86 to −0.19	0.27	−0.08 to 0.64
Diabetes (vs cut)	0.68*	0.34 to 1.01	−0.59*	−0.93 to −0.24	−0.55*	−0.91 to −0.19
Epilepsy (vs cut)	−1.29*	−1.59 to −0.98	−0.27*	−0.49 to −0.07	0.17	−0.12 to 0.47
Age	−0.04	−0.12 to 0.04	−0.01	−0.11 to 0.09	−0.21*	−0.30 to −0.11
Male (vs female)	−0.02	−0.27 to 0.23	0.06	−0.26 to 0.39	−0.31*	−0.62 to −0.00
Hindu (vs Christian)	0.28	−0.00 to 0.58	0.37*	0.03 to 0.72	−0.32*	−0.66 to −0.01
Muslims (vs Christian)	−0.20	−0.61 to 0.22	1.70*	1.20 to 2.18	−0.61*	−1.08 to −0.12
Other (vs Christian)	−0.09	−0.71 to 0.51	−0.30	−1.09 to 0.46	0.03	−0.66 to 0.75
Random Effects						
σ^2	3.22		1.44		2.99	
τ_{00}	0.57		2.74		1.65	
ICC	0.15		0.66		0.36	
N	519		517		519	
Observations	1033		1027		1032	

*95% credible interval does not include 0.

Table 4. Interaction effects between diseases and uncertainty (−3 to 3).

	Own fault		God		Other (witchcraft)	
Predictors	*Est.*	*CI (95%)*	*Est.*	*CI (95%)*	*Est.*	*CI (95%)*
Intercept	1.61*	1.30 to 1.92	−0.34*	−0.67 to −0.01	0.04	−0.31 to 0.38
Dementia (vs cut)	−0.19	−0.64 to 0.26	−0.26	−0.74 to 0.20	0.46†	−0.05 to 0.94
Diabetes (vs cut)	0.83*	0.41 to 1.27	−0.49*	−0.94 to −0.02	−0.36	−0.85 to 0.14
Epilepsy (vs cut)	−1.06*	−1.48 to −0.63	−0.21	−0.63 to 0.21	0.50*	0.06 to 0.97
High Uncertainty (vs low)	0.36†	−0.04 to 0.77	0.39†	−0.02 to 0.81	0.32	−0.12 to 0.76
Dementia*Uncertainty	−0.80*	−1.40 to −0.21	−0.57†	−1.22 to 0.09	−0.34	−1.01 to 0.31
Diabetes*Uncertainty	−0.28	−0.88 to 0.32	−0.21	−0.86 to 0.41	−0.39	−1.04 to 0.30
Epilepsy* Uncertainty	−0.46	−1.11 to 0.15	−0.13	−0.88 to 0.63	−0.71†	−1.44 to 0.02
Random Effects						
σ^2	3.17		3.03		1.41	
τ_{00}	0.60		1.71		3.06	
ICC	0.16		0.36		0.68	
N	530		530		528	
Observations	1050		1049		1044	

*95% credible interval does not include 0.
†90% credible interval does not include 0.
Sigma squared = variance, tau00 = variance of cluster means, ICC = intra-class correlation (degree to which two randomly drawn observations within a cluster are correlated).

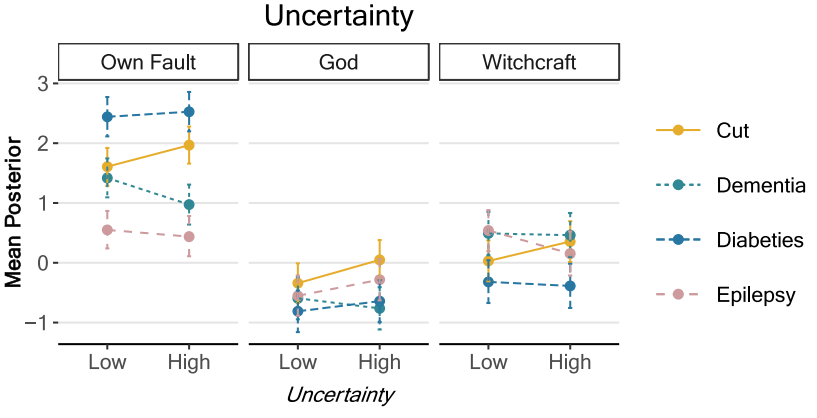

Figure 3. Effects of uncertainty manipulation on outcome questions for each disease. Error bars are 95% credible interval of the posterior distribution.

Figure 4), we see that these effects vary considerably by disease, with an increase in supernatural causes showing up only for the cut vignette, and cures for the cut and to a lesser degree for the diabetes vignettes.

Together, this is inconsistent evidence that increased uncertainty about an illness will increase the rate of supernatural causes and cures related to that illness.

Does greater severity result in greater levels of supernatural causation/treatment?

Analyses in this section were run as fixed effect Bayesian models with weakly normalizing priors. Random effects were not used here because each participant only saw one severity vignette. Freelist data was analyzed with Bayesian Poisson regressions. Here, we used only the vignettes with disease severity as a manipulated variable and interacted these conditions with the uncertainty conditions. No effects were found for severity, uncertainty, or the interaction effect in these models (Table 7). If

Table 5. Number of supernatural causes and cures in freelists predicted by uncertainty.

	Causes		Cures	
Predictors	*IRR*	*CI (95%)*	*IRR*	*CI (95%)*
Intercept	0.37*	0.24–0.54	0.16*	0.10–0.26
Uncertainty (vs low)	1.24	0.92–1.68	1.03	0.76–1.41
Dementia (vs cut)	0.26*	0.16–0.39	0.90	0.59–1.38
Diabetes (vs cut)	0.13*	0.07–0.22	0.40*	0.24–0.69
Epilepsy (vs cut)	0.38*	0.26–0.54	1.06	0.72–1.56
Age	0.96	0.87–1.06	1.10	0.99–1.22
Male (vs female)	0.96	0.70–1.33	0.89	0.64–1.25
Hindu (vs Christian)	0.84	0.59–1.19	0.98	0.67–1.43
Muslims (vs Christian)	0.95	0.58–1.52	1.12	0.65–1.86
Other (vs Christian)	0.78	0.33–1.67	0.76	0.29–1.78
Random Effects				
σ^2	0.07		0.06	
τ_{00}	0.19		0.14	
ICC	0.26		0.3	
N	449		450	
Observations	880		898	

*95% credible interval does not include 1.

Table 6. Interaction effects between diseases and uncertainty.

	Causes			Cures	
Predictors	*IRR*	*CI (95%)*	*CI (90%)*	*IRR*	*CI (95%)*
Intercept	0.31*	0.22–0.42	0.24–0.40	0.15*	0.10–0.22
Dementia (v cut)	0.43*	0.24–0.76	0.27–0.68	1.45	0.86–2.53
Diabetes (v cut)	0.19*	0.09–0.38	0.10–0.33	0.49*	0.24–0.99
Epilepsy (v cut)	0.60*	0.37–0.99	0.40–0.91	1.84*	1.11–3.12
Uncertainty	1.92*	1.30–2.85	1.40–2.66	1.87*	1.15–3.12
Dementia*Uncertainty	0.40*	0.18–0.87	0.21–0.77	0.40*	0.19–0.82
Diabetes*Uncertainty	0.39†	0.14–1.05	0.16–0.90	0.75	0.30–1.79
Epilepsy*Uncertainty	0.39*	0.20–0.77	0.22–0.69	0.31*	0.15–0.62
Observations	896			896	

*95% credible interval does not include 1.
†90% credible interval does not include 1.

anything, the effects trend in the opposite direction from what we predicted (Figure 5). Additionally, there were no effects when the interaction effects were removed from the models (see supplemental materials).

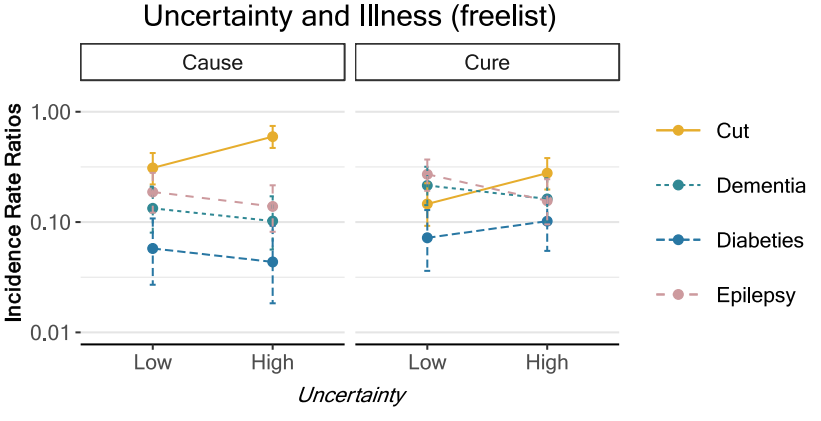

Figure 4. Effects of uncertainty manipulation on number of supernatural items included in freelists for each disease. Error bars are 95% credible intervals of the posterior distribution.

Table 7. Cause ratings for the three outcome questions predicted by severity and uncertainty.

	Own fault		God		Other (witchcraft)	
Predictors	Est.	CI (95%)	Est.	CI (95%)	Est.	CI (95%)
Intercept	2.69*	2.24 to 3.12	−1.12*	−1.55 to −0.67	0.16	−0.34 to 0.63
High Severity (vs low)	−0.23	−0.66 to 0.22	−0.32	−0.74 to 0.12	−0.30	−0.78 to 0.19
High Uncertainty (vs low)	−0.22	−0.68 to 0.23	0.08	−0.37 to 0.53	−0.32	−0.81 to 0.18
Epilepsy (vs diabetes)	−1.95*	−2.28 to −1.61	0.32†	−0.00 to 0.64	0.70*	0.34 to 1.04
Severity*Uncertainty	0.41	−0.22 to 1.01	0.20	−0.43 to 0.79	0.20	−0.49 to 0.87
Age	−0.02	−0.11 to 0.07	0.02	−0.07 to 0.12	−0.10*	−0.20 to −0.00
Male (vs female)	−0.15	−0.49 to 0.18	0.07	−0.25 to 0.41	−0.20	−0.57 to 0.16
Hindu (vs Christian)	0.17	−0.20 to 0.54	0.48*	0.09 to 0.86	−0.25	−0.65 to 0.14
Muslims (vs Christian)	−0.27	−0.76 to 0.22	1.68*	1.14 to 2.21	−0.25	−0.81 to 0.32
Other (vs Christian)	−0.66*	−1.29 to −0.03	−0.08	−0.69 to 0.55	−0.07	−0.76 to 0.61
Observations	518		513		517	

*95% credible interval does not include 0.
†90% credible interval does not include 0.

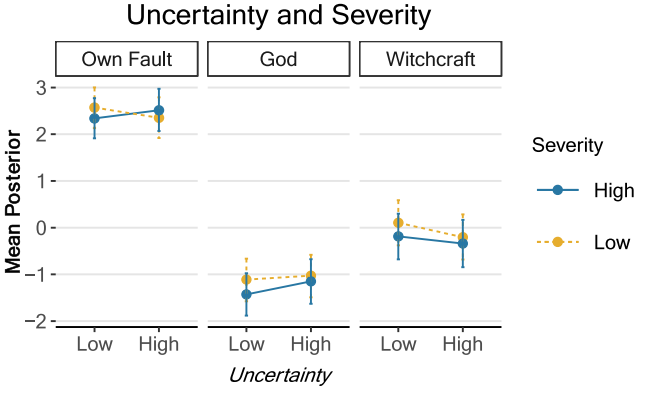

Figure 5. Effects of uncertainty and severity manipulations on outcome questions. Error bars are 95% credible intervals of the posterior distribution.

Table 8. Number of supernatural causes and cures in freelists predicted by severity and uncertainty.

	Causes		Cures	
Predictors	*IRR*	*CI (95%)*	*IRR*	*CI (95%)*
Intercept	0.07*	0.03–0.16	0.09*	0.05–0.18
High Severity (vs low)	0.93	0.47–1.75	1.36	0.78–2.39
High Uncertainty (vs low)	0.48	0.21–1.06	0.73	0.37–1.41
Epilepsy (vs Diabetes)	2.92*	1.59–5.65	2.42*	1.48–4.11
Severity*Uncertainty	1.99	0.76–5.39	0.97	0.43–2.33
Age	1.06	0.90–1.25	1.10	0.96–1.26
Male (vs female)	0.88	0.51–1.50	0.80	0.50–1.28
Hindu (vs Christian)	0.86	0.47–1.53	0.98	0.59–1.61
Muslims (vs Christian)	0.86	0.35–1.91	1.18	0.59–2.16
Other (vs Christian)	0.61	0.14–2.00	0.34	0.07–1.11
Observations	439		450	

*95% credible interval does not include 1.

Similar results were found in the freelist data, with no reliable effects for either severity or uncertainty predicting supernatural causes (Table 8). We did find a non-negligible increase in supernatural cures in the high compared to the low severity question (IRR = 1.36. *95%CI*[0.78–2.39]; Figure 6). Again, we see no reliable effects if the interaction is removed (see supplemental materials).

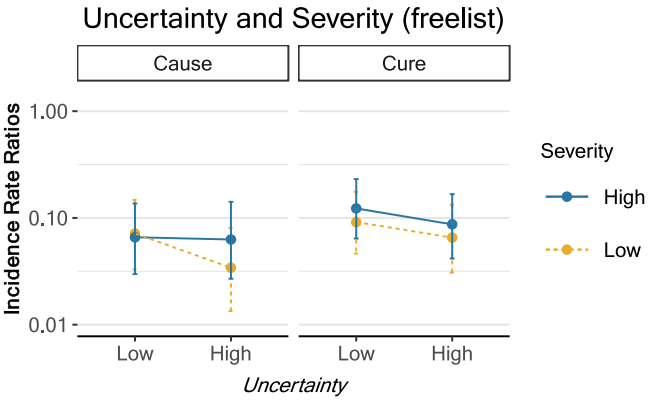

Figure 6. Effects of uncertainty and severity manipulations on number of supernatural items included in freelists. Error bars are 95% credible intervals of the posterior distribution.

Table 9. Cause ratings for the three outcome questions predicted by reputation and uncertainty (−3 to 3).

	Own fault		God		Other (witchcraft)	
Predictors	*Estimates*	*CI (95%)*	*Estimates*	*CI (95%)*	*Estimates*	*CI (95%)*
Intercept	1.81*	1.33 to 2.29	−0.83*	−1.36 to −0.34	0.52*	0.01 to 1.01
Bad Reputation (vs good)	−0.28	−0.74 to 0.19	0.46†	−0.04 to 0.96	0.17	−0.33 to 0.67
High Uncertainty (vs low)	−0.19	−0.65 to 0.28	0.04	−0.43 to 0.52	0.03	−0.47 to 0.50
Dementia (vs cut)	−0.61*	−0.96 to −0.28	−0.55*	−0.90 to −0.18	0.25	−0.12 to 0.62
Age	−0.03	−0.14 to 0.07	−0.03	−0.14 to 0.09	−0.26*	−0.37 to −0.14
Male (vs female)	0.11	−0.22 to 0.46	0.13	−0.24 to 0.50	−0.38*	−0.76 to −0.02
Hindu (vs Christian)	0.29	−0.07 to 0.67	0.31	−0.09 to 0.70	−0.40†	−0.81 to 0.00
Muslim (vs Christian)	−0.22	−0.76 to 0.30	1.68*	1.10 to 2.25	−0.91*	−1.48 to −0.36
Other (vs Christian)	−0.15	−0.92 to 0.62	−0.55	−1.36 to 0.32	−0.21	−1.03 to 0.60
Rep*Uncert	0.36	−0.32 to 0.96	0.22	−0.44 to 0.89	0.35	−0.33 to 1.03
Observations	514		513		514	

*95% credible interval does not include 0.
†90% credible interval does not include 0.

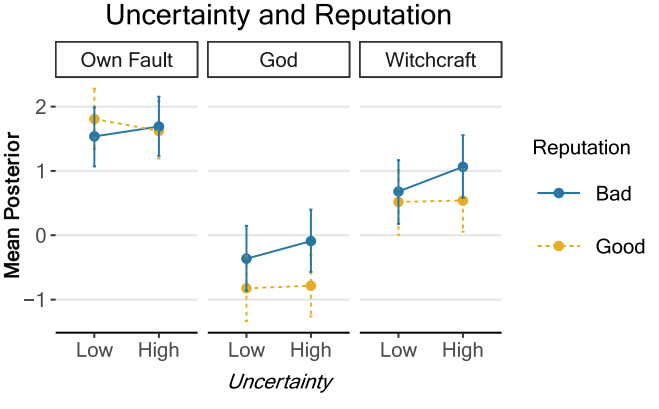

Figure 7. Effects of uncertainty and reputation manipulations on outcome questions. Error bars are 95% credible intervals of the posterior distribution.

Table 10. Number of supernatural causes and cures in freelists predicted by reputation and uncertainty.

	Cause		Cure	
Predictors	*IRR*	*CI (95%)*	*IRR*	*CI (95%)*
Intercept	0.14*	0.07–0.26	0.13*	0.07–0.24
Bad Reputation (vs good)	4.04*	2.28–7.72	1.55	0.87–2.79
High Uncertainty (vs low)	1.60	0.85–3.08	1.37	0.78–2.48
Dementia (vs cut)	0.24*	0.16–0.36	0.89	0.60–1.32
Age	0.97	0.46–1.98	0.93	0.44–2.02
Male (vs female)	0.92	0.83–1.02	1.09	0.96–1.23
Hindu (vs Christian)	1.18	0.84–1.65	0.98	0.64–1.48
Muslim (vs Christian)	0.90	0.62–1.31	1.04	0.66–1.63
Other (vs Christian)	1.06	0.62–1.71	1.18	0.63–2.11
Rep*Uncert	0.84	0.35–1.79	1.19	0.47–2.61
Observations	441		448	

*95% credible interval does not include 1.

Does negative reputational information result in greater levels of supernatural causation?

As with severity, analyses for reputation were run as fixed effect Bayesian models with weakly normalizing priors. Freelist data was analyzed with Bayesian Poisson regressions. We found a positive effect for a bad reputation compared to a good reputation on questions about the illness being caused by God (Table 9). An effect for witchcraft was found but was only reliably predicted when the interaction with uncertainty was not included in the model (*est.* = 0.40, *95%CI* [0.03–0.77]; see supplemental materials for full table). There is no reliable effect of uncertainty, though for both God and Witchcraft, ratings increased in the bad reputation condition when uncertainty was high (Figure 7). There are no reliable interaction effects. We had no predictions for own fault but found that both reputation and uncertainty were slightly negative predictors of blaming the sufferer, though neither were reliably predicted.

The effects of reputation were also found in the freelist data, where higher rates of supernatural causes and cures were given when the sufferer was known to have behaved in a way that would earn them a bad reputation (Table 10). This was only reliably estimated for causes, with 4.01 (*95%CI* [2,28–7.72]) supernatural causes given in the bad reputation condition for each one given in the good reputation condition, or 4 times as many. There is no reliable interaction effect for either supernatural causes or cures (Figure 8).

Do supernaturally caused illnesses have supernatural cures?

Finally, we ran some exploratory analyses to examine if offering supernatural causes increases the likelihood of offering a supernatural cure. When we look at our scaled questions we find no effect for claiming a disease might be caused by God on the rates of supernatural cures (IRR = 0.98, *95%CI* [0.91–1.06]), but an increase in supernatural cures with an increase in ratings of witchcraft as a cause. For each 1-point increase in the scale (i.e., the difference between giving a 1 vs 2 rating or a 6 vs 7 rating) there is a corresponding 1.16 increase in supernatural cures (IRR = 1.16, *95%CI* [1.08–1.24]). Full tables can be found in the supplemental materials.

When we use the number of supernatural causes offered in the freelists to predict supernatural cures, we find a strong positive effect (Table 11). For each additional supernatural cause given, there is a corresponding increase of 2.61 supernatural cures given. This effect is stronger for some illnesses than others, but positive in all cases (Figure 9). This suggests that people are more likely to list a supernatural cure when they believe something might have had a supernatural cause. The included demographic predictors are largely non-informative, but slightly older participants are more likely to pick supernatural cures.

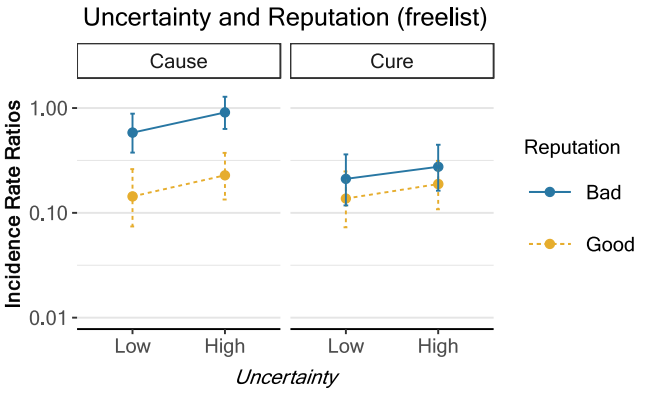

Figure 8. Effects of uncertainty and reputation manipulations on number of supernatural items included in freelists. Error bars are 95% credible intervals of the posterior distribution.

Table 11. Number of supernatural causes listed predicted by number of supernatural cures listed.

Predictors	IRR	CI (95%)
Intercept	0.11*	0.07–0.16
Super. Cause	2.61*	2.13–3.16
Dementia (vs cut)	1.55*	1.00–2.35
Diabetes (vs cut)	0.76	0.43–1.29
Epilepsy (vs cut)	1.57*	1.05–2.35
Age	1.07†	0.99–1.14
Male (vs female)	0.86	0.63–1.18
Hindu (vs Christian)	1.00	0.70–1.41
Muslim (vs Christian)	1.04	0.65–1.65
Other (vs Christian)	0.71	0.34–1.38
Observations	880	

*95% credible interval does not include 1.
†90% credible interval does not include 1.

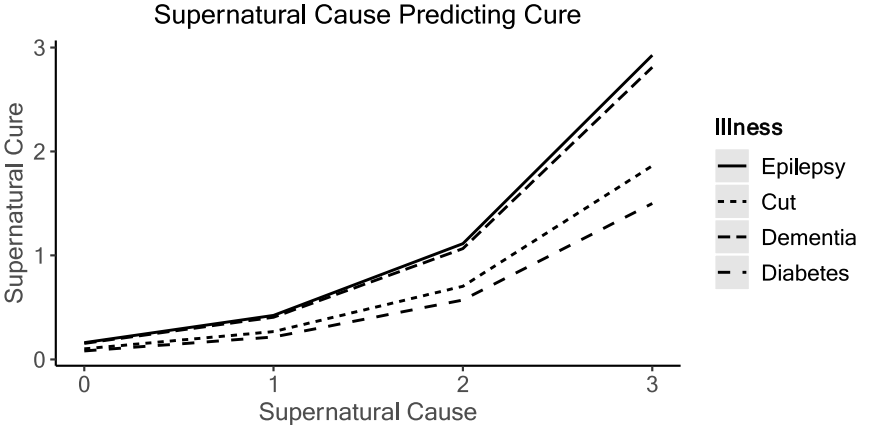

Figure 9. Number of supernatural causes given in predicting the number of supernatural cures given in free lists.

Discussion

Participants suggested supernatural causes and cures across all our vignettes, but the rates differed dramatically with the four illnesses. Diabetes showed the lowest number across all measures. This is potentially due to the disease being too easily recognized from the vignette description and people's understanding of the disease undercutting our manipulations ("diabetes" was the most salient cause in the freelists). When we look at the other diseases, we see that the belief that God caused the illnesses is slightly negative—on average participants thought God was a slightly unlikely cause—but witchcraft is positive—on average participants thought witchcraft was a slightly likely cause for all diseases except diabetes. We also see witchcraft appear in the fine-grained coding of the freelist data for the cut vignette. This and karma (also in the cut condition) are the only supernatural items that appear salient in the cause lists, but prayer shows up as salient in all the cure lists (except for the diabetes lists). This suggests that the belief that prayer will help when sick is common across illnesses.

Illness symptoms without a clear cause were more likely to be attributed to God than illness symptoms with a stated cause, but the results varied from illness to illness. Witchcraft, on the other hand, was not associated with causal uncertainty here. There is a positive but not well estimated effect for increased supernatural causes in the freelists, but no effect for cures. These results provide some support to the idea that causal uncertainty plays an important role in the use of supernatural beliefs to explain illnesses, with more uncertain or confusing illnesses leading to higher rates of supernatural causes. However, the effects of the causal uncertainty manipulation on people's tendency to draw on supernatural explanations were neither strong nor consistent and may be weak relative to disease-level factors we do not fully understand. This makes this an area ripe for further research, potentially with stronger manipulations and a larger sample.

Assuming these findings are robust, how do we explain these effects of causal uncertainty on the propensity to reach for religious explanations? The possibility most likely to us is that people readily use mechanistic/secular explanations for illness when those are available, but in contexts where there is no obvious mechanism driving the observed patterns people fill the explanatory gap with more religious or other supernatural explanations. Having *any* explanation may be more psychologically rewarding than remaining in a state of uncertainty about the causes or attributing the illness to chance.

These findings are some evidence in support of the idea that people do reach for supernatural explanations when things are more uncertain (Evans-Pritchard, 1937; Malinowski, 1954) as a way to potentially gain back some sense of control (Kay et al., 2010). More work is needed here to increase our confidence in these findings.

We found no evidence to support the prediction that severity increased the rates of supernatural causes. There was some effect for predicting supernatural cures, but this was not reliably estimated and should be considered suspect given the lack of effects across any of our other measures. It is possible that we are not reaching the level of severity needed to increase supernatural beliefs or that severity would have shown an effect if paired with more impactful symptoms like in the cut vignette. Our methods cannot get at the intense emotional and psychological effects of severity on an individual when they are the one suffering (e.g., Sibley & Bulbulia, 2012) or threatened with death (Jong, 2021). This intensity may be what is needed to really increase the use of supernatural beliefs. Still, we can demonstrate here that knowing a disease has more intense symptoms does not have a similar impact. Severity, if a factor, may be important when experienced or witnessed rather than manipulated in a brief vignette.

When the protagonist behaved poorly, rates of belief in supernatural causes for their illnesses increased. For the scaled questions, this effect was found for both God and witchcraft, though the latter was only reliable when the interaction with uncertainty was not included. When we inspect the data, it is clear that the effect of a bad reputation on the belief in witchcraft as a cause is larger when uncertainty is high. This effect is supported by other work in Mauritius that found reputational information increased the rates of witchcraft as a cause of non-illness-based

misfortune (Willard et al., 2024). We see a similar pattern for belief in God, but with some effect of bad reputation present even when uncertainty is low. When we look at the freelist answers, the effect of reputation is much stronger. Participants are four times as likely to list a supernatural cause when the vignette character has a bad reputation than when the character has a good one. There is a similar but much smaller effect for supernatural cures, and no interaction here with uncertainty for either the cause or cure lists. These findings are supported by a wealth of literature on the moralizing nature of religious belief (Johnson, 2016; Lang et al., 2019; Norenzayan et al., 2016; Purzycki et al., 2016). These findings add to our understanding of this relationship between religion and morality by showing that people use information about past bad actions to infer if present misfortunes might be a form of supernatural punishment.

In many places, the effects were in part driven by the most ambiguous vignette about mysterious cuts on one's feet. It is possible that the other vignettes were too easily identifiable with known diseases. If participants could identify a known cause, then the uncertainty of cause written into the vignette may have lost its effect. As with most other populations in the world today, many Mauritians have sophisticated medical knowledge and could identify the diseases we used relatively easily. The existing understanding of these diseases may have impacted how people answered the question, either by giving them a ready-made answer that superseded the manipulation, or by giving them a "correct" answer they gave to us because we were researchers and they expected us to want a medical rather than supernatural answer. Indeed, many participants were more willing to talk about the possibility of supernatural causes, particularly witchcraft, when talking casually after the interviews than they were in the interviews. Other informal interviews we conducted also suggested that these causes were more common than we found here, though in both cases these claims where often about how other people might think about the diseases rather than the informants themselves.

In general, our manipulations had stronger effects on the causes of disease than on the cures for disease: It may be the case that supernatural beliefs play a stronger role in understanding disease aetiology than in generating solutions. Familiarity with observably effective evidence-based medicine may have done more to undermine supernatural solutions than explanations. What does seem to predict supernatural cures is the belief that something was supernaturally caused. This effect is found for witchcraft in our scaled questions, and there is a strong predictive effect of offering up supernatural causes predicting supernatural cures in the freelist. This may be driven by people's pre-existing tendency to use supernatural beliefs, but the slight effects we do see from our manipulations on cures suggests that there may be some indirect effects of the manipulations here. Future work may want to look at if belief in supernatural causes is the main reason for choosing a supernatural cure. Alternatively, things like greater uncertainty—or not feeling like you understand the cause—may increase people's willingness to try more supernatural cures more directly because no clear direction is given by the cause of the disease. Without a clear division between what is natural and supernatural, we are left with people potentially being more willing to try more causally complex or implausible things when they otherwise don't know what is going on or when they have little to lose by trying more unlikely things (see Foster & Kokko, 2008).

At a psychological level, what is and is not supernatural is not clearly divided, and what we generally consider supernatural may be a more indirect concept of cause that is often rejected in a more scientific world view. It is not obvious that there is a clear-cut division between natural and supernatural in most people's minds, and there are many areas where the overlap is quite gray. For example, many people in the West believe that astrology is scientific (Allum, 2011). In Mauritius (and elsewhere) we came across Hindu and Muslim believers who claimed that all scientific knowledge could be found in their religious texts and beliefs. Previous research that has shown that people are capable of holding both supernatural and natural causes of an illness at the same time tends to frame these explanations as opposites (e.g., Legare & Gelman, 2008), but this may not reflect how people think about these different causes. Seeing these on a causal spectrum of more or less plausible causes within a given worldview (i.e., one that treats both God and witchcraft as true, or one

that treats neither as true) might be necessary. The effects we find here may be explained by people's willingness to try more indirect or more implausible causal pathways (e.g., harming someone through magic rather than physical contact) when things are more uncertain and/or important to solve.

Conclusion

We found some evidence suggesting that both uncertainty about causes and reputational information about victims can increase the rates at which our sample is willing to employ a supernatural explanation for an illness. This gives us some insight into when and why people might use supernatural beliefs as explanations more generally. We suggest that the use of these explanations can increase when people want a causal question answered and other types of causes are not forthcoming, or when people are seen to be deserving of punishment. These are unlikely to be the only reasons people use supernatural explanations, and as a whole, when and why people use supernatural beliefs to explain something in their lives is an area ripe for future investigation.

Notes

1. This is likely linked to recent political movements in Mauritius.
2. It is worth noting that these conditions would have only appeared in half of the vignettes, making the salience of these likely much higher.
3. This deviates from our pre-registration where we said we would additionally include random intercepts for illness, but this type of nested analysis was deemed unwise given the small number of illnesses and sample size. Illnesses were included as dummy coded fixed effects instead.

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