

# Witchcraft Beliefs and Subjective Well-Being\*

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## Abstract

This study examines the relationship between contemporary witchcraft beliefs and subjective well-being at the individual level. Using survey data from two waves of the Gallup World Poll in Sub-Saharan Africa, we show that witchcraft believers report lower levels of life satisfaction and are more likely to experience stress, worry, and sadness rather than happiness and enjoyment. Consistent with these patterns, a global dataset based on the Pew Research Center surveys reveals that witchcraft believers are less satisfied with how “things are going” in their countries. Both data sources further reveal a strong association between belief in witchcraft and an external locus of control expressed in fatalism and a perceived lack of freedom in making life choices. These findings are in line with the ethnographic evidence on the stress-inducing impact of witchcraft-related fears and contrast sharply with the widely explored role of religion and related supernatural beliefs in coping with anxiety.

*Keywords:* Happiness, Life satisfaction, Religion, Religiosity, Subjective well-being, Supernatural beliefs, Witchcraft

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# 1 Introduction

The study of subjective well-being, based on self-reported measures of life satisfaction, happiness, and emotional experiences, currently occupies an important place within economics, a discipline previously focused on standard welfare metrics such as income and consumption levels (Nikolova and Graham, 2022). Alongside material conditions, health, education, and environment, subjective well-being is also increasingly recognized as a desirable public policy outcome, as reflected, for instance, by the OECD *Better Life Initiative* launched in 2011 and the *World Happiness Report* published annually by the UN Sustainable Development Solutions Network since 2012.

Among many potential determinants of subjective well-being, religion and religiosity received a lot of attention, with most studies pointing to their generally positive role (Popova and Otrachshenko, 2021). Whether looking at affiliation, beliefs, or participation in religious activities, this research has focused on major world religions, while other supernatural beliefs remain largely ignored, as is more generally the case in the economics of culture and religion literature (Gershman, 2017; 2022b). We fill this gap by exploring the individual-level relationship between subjective well-being and beliefs in witchcraft, defined as an ability of certain people to intentionally cause harm via supernatural means. Such beliefs are highly widespread throughout the world, cut across socio-demographic groups, and are intertwined with many aspects of economic and social relations (Gershman, 2022a).

Our empirical analyses rely on surveys containing self-reported data on both subjective well-being and witchcraft beliefs. Specifically, we examine two waves of the Gallup World Poll in Sub-Saharan Africa (2009, 2011) and a global dataset constructed by Gershman (2022a) using six waves of the Pew Research Center surveys (2008–2017). Although these two independent data sources provide different metrics of well-being and witchcraft beliefs, the main patterns are consistent. Individuals claiming to believe in witchcraft are less satisfied with their lives and the way things are going in their country. They are more likely to experience negative emotions such as worry and sadness rather than happiness and enjoyment, feel less free to make life choices, and believe more strongly in fate. Qualitatively, these findings stand in contrast to the typical results, also replicated in our setting, on the positive association between religion and subjective well-being. Quantitatively, our estimates for witchcraft beliefs are not large in magnitude, but comparable in absolute value to the contributions of religiosity and other socio-demographic characteristics.

This study contributes mainly to two strands of literature. First, it adds to the growing empirical work on the cultural correlates of subjective well-being by establishing its

negative association with contemporary witchcraft beliefs. This key finding shows that, despite commonalities among the claimed functions of supernatural beliefs, such as providing “explanations” for misfortune and coping mechanisms, their ultimate role in reducing or elevating anxiety is belief-specific.

Second, we contribute to the literature on witchcraft beliefs across social sciences and specifically the nascent quantitative literature on the subject (Gershman, 2022b). Previous work has focused on the link between witchcraft beliefs and social relations broadly defined (Gershman, 2016; Mace et al., 2018; Le Rossignol et al., 2022), as well as cross-country correlates reflecting potential social costs and benefits of witchcraft beliefs (Gershman, 2022a). Here, we closely examine one of such costs, in the form of diminished subjective well-being, at the individual level. While this idea has long been expressed in ethnographic studies, it has not been backed by systematic empirical evidence.

The rest of this chapter is organized as follows. The next section briefly reviews the relevant literature. Sections 3 and 4 present the empirical results for Sub-Saharan Africa and the world, respectively. Section 5 concludes.

## **2 Supernatural beliefs and psychological well-being**

Before presenting the main analysis, we review recent work linking supernatural beliefs to well-being. We find both similarities and distinctions between the widely explored role of religion and the psychosocial impacts of witchcraft beliefs described in the literature.

### **2.1 Religiosity, religion, and religious beliefs**

There is a very large literature, mainly in psychology, but also in other disciplines, on religiosity (typically measured as claimed importance of religion or God in life or as actual participation in religious activities) as a determinant of subjective well-being. While the debate is ongoing and the bulk of evidence is correlational rather than causal, detailed reviews find a generally positive association between the two (Tay et al., 2014; Popova and Otrachshenko, 2021). In particular, meta-analyses have shown that religiosity is generally associated with fewer depressive symptoms and lower anxiety (Smith et al., 2003; Abdel-Khalek et al., 2019). However, the specific details of these relationships are complex and context-dependent, with many mechanisms likely operating at once and in opposite directions (Pöhls, 2021).

Multiple channels have been suggested and investigated to explain what is commonly interpreted as a positive effect of religiosity on subjective well-being. The first set of channels emphasize the social dimension of being religious and engaging in respective activities. Religious involvement provides opportunities for interacting with like-minded people, building networks of friendship, trust, and support, and creating a sense of social belonging, all of which improve individual well-being. The importance of social capital as a mediating channel has also been demonstrated empirically (Lim and Putnam, 2010; Diener et al., 2011; Dunbar, 2021).

The second set of mechanisms focus on personal, rather than social, aspects of religion related to deep psychological needs and existential fears (Routledge, 2018). Religion has long been argued to serve as a coping mechanism for dealing with adverse shocks such as experiences of loss and hardship, although religious coping can express itself in different forms (Pargament, 2002) and may affect psychological adjustment to stress both positively and negatively (Ano and Vasconcelles, 2005). Attributing outcomes to God's will may mitigate anxiety and provide relief in the face of unpredictable and uncertain events (Bentzen, 2019), but it may also lead to emotional distress due to "spiritual struggles" expressed in anger at God and a sense of divine abandonment or punishment (Pargament and Exline, 2022).

Religion may further affect individual well-being through perceived sense of control, although, as in the case of religious coping, the direction of this effect is theoretically ambiguous. One meta-analysis reveals an overall positive, if not quantitatively large, correlation between religiosity and internal locus of control, a perception of rewards and punishment following largely from personal actions rather than external forces (Coursey et al., 2013). A related strand of research finds a positive association between religiosity and self-control, reflecting the ability to suppress tempting behaviors with short-term rewards, as well as a broader capacity to self-regulate, that is, guide and adjust behavior in pursuit of desired goals (McCullough and Willoughby, 2009). Analysis of further mechanisms shows that religion may also improve psychological well-being by generating positive emotions (Van Cappellen et al., 2016), fostering virtues (Sharma and Singh, 2019), providing a sense of purpose and meaning in life (Diener et al., 2011), promoting prosocial behavior (Tsang et al., 2021), reducing risky behaviors and improving physical health (Routledge, 2018).

Although the empirical work on religion and subjective well-being largely focuses on basic measures of religiosity, the scope of this literature has recently expanded to include specific beliefs in the supernatural (Park, 2017). These are, for example, beliefs in heaven and hell, God and the devil, demons and spirits, an afterlife, karma, and fate, all of which

are integral to some of the major religious traditions around the world. As pointed out in a comprehensive review by Exline and Wilt (2023), just as with religion in general, these beliefs can perform various functions such as helping to cope with anxiety, providing moral guides, and serving as decision-making tools, but they may also cause distress. Indeed, studies have shown that the association between supernatural beliefs and subjective well-being varies by type of belief, sometimes in very specific ways. For example, belief in an afterlife has generally been found to be positively related to psychological well-being as expressed in fewer symptoms of anxiety, depression, and paranoia, and higher levels of tranquility (Flannelly et al., 2006; Ellison et al., 2009). However, taking a closer look, Flannelly et al. (2008) show that only “pleasant” views of the afterlife (e.g., as a union with god and the loved ones or a “paradise of pleasures and delights”) are linked to better psychological states. Exactly the opposite is true for what the authors rated as “unpleasant” views of the afterlife (as a “pale shadowy form of life” or reincarnation into another life form). Similarly, Shariff and Akinin (2014) show that beliefs in heaven and hell are associated with, respectively, higher and lower metrics of happiness and life satisfaction at the national and individual levels pointing to potentially distinct emotional impacts of these two “versions” of life after death.

More closely related to this chapter’s main subject, several studies linked certain beliefs in supernatural evil forces to subjective well-being. Exline et al. (2014) develop a “religious/spiritual struggle” scale and show that, in a sample of U.S. college students, its different elements, including the “demonic struggle” subscale revealing people’s concern that “the devil or evil spirits are attacking an individual or causing negative events,” correlate positively with anxiety and depression and negatively with life satisfaction. Abu-Raiya et al. (2015) find the same pattern in a nationally representative U.S. survey. Using the data from the National Study of Youth and Religion, Nie and Olson (2016) show that belief in the “existence of demons or evil spirits” is negatively related to psychological well-being. Furthermore, exploiting the panel structure of the dataset, they show that the rise in this belief precedes the fall in well-being, and that it is one of the strongest predictors of future changes in mental health compared to other religious beliefs and practices. Consistent with this finding, Jung (2020) reports that in the 2010 Baylor Religion Survey, belief in the devil and demons is positively associated with anxiety and paranoia.

## 2.2 Witchcraft beliefs

Despite the growing attention to specific supernatural beliefs in their relation to subjective well-being, belief in witchcraft, that is, ability of certain people to cause harm via supernatural means such as curses and spells, has been largely ignored in this context, perhaps due to its less obvious place within major religious traditions. Yet, witchcraft beliefs are widespread around the globe, correlate positively with religiosity and belief in god, and cut across religious affiliations (Gershman, 2022a). Furthermore, unlike beliefs in supernatural evil beings such as demons, spirits, or the devil, witchcraft beliefs attribute misfortune to supernatural abilities and explicit desires of fellow humans, with direct implications for social relations (Gershman, 2016). Overall, as discussed by Gershman (2022b), along with performing potentially useful functions such as enforcing in-group conformity and “explaining” adverse events, witchcraft beliefs produce an array of negative consequences, including diminished trust and cooperation, reduced social mobility and innovation, and, particularly relevant to this study, heightened anxiety due to the fear of witchcraft attacks and accusations.

The stress-inducing effects of witchcraft fears were highlighted in some of the earliest ethnographic studies on the subject including the classic work of Evans-Pritchard (1937) on the Azande. Despite his focus on the internal logic and functions of witchcraft beliefs and an implicit attempt to downplay the “emotional turbulence” they cause, Evans-Pritchard presents ample evidence of pervasive witchcraft-related anxiety (Kennedy, 1967). He describes how, upon receiving an oracle’s message about a threat to their health, people in the Azande community remained “downcast until they had annulled the verdict of the oracle by getting the witch who threatened them to quiet his witchcraft.” In general, their belief that witches may “at any time bring sickness and death upon them” guided the daily lives of the Azande and their anxious desire to counteract witchcraft and maintain some control over their destiny.

While recognizing their harmful impact on psychological well-being, some early scholarship also suggested that witchcraft beliefs could serve to *resolve* anxiety by providing an explanation for unfortunate events and an outlet for releasing hostile feelings, an idea thoroughly elaborated by Kluckhohn (1944) for the case of the Navajo. He argued in particular that “witchcraft belief allows the verbalization of anxiety in a framework that is understandable and which implies the possibility of doing something” since witches, being actual humans rather than abstract supernatural forces, “are potentially controllable by the society.” Similarly, looking at the Chewa, Marwick (1948) proposed that witchcraft beliefs

represent a “cultural safety-valve for the discharge of anxiety” while noting, in the same study, that this belief system operates in a “vicious circle, resolving anxiety but at the same time creating more of it.” A similar conclusion follows from Nadel’s (1952) comparative analysis of four African societies: although witchcraft accusations do channel accumulated hostilities towards a few scapegoats and each persecution of witches “no doubt relieves the tensions and stresses in a cathartic manner,” they also *add* to the “stresses of the society, through causing a serious disturbance of social life.” These somewhat paradoxical observations are reminiscent of the debate on religious coping which, as discussed earlier, may bring either relief or “spiritual struggles” and thus have ambiguous psychological effects.

In his study of the Wolof in the Gambia, Ames (1959) makes a forceful case against the purported anxiety-relieving function of witchcraft beliefs. Rejecting Kluckhohn’s view, he states unequivocally that “it is precisely the lack of certain control over *doma* [witches] that most disturbs the Wolof and increases anxiety.” Their fear of witches “often verges on a morbid pessimism – a feeling that they will always be a permanent fixture of life, and that if a person is fated to die from one of their attacks nothing can be done about it.” Such despair was ubiquitous despite the numerous taboos, daily precautions, and magical devices employed by the Gambian Wolof to ward witches off. The pessimistic worldview of the mid-twentieth century Wolof echoes the witchcraft obsession of the late-nineteenth-century Santals of India, as conveyed by the Guru Kolean Haram to the Norwegian missionary Lars Skrefsrud (Kelkar and Nathan, 2020): “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.”

Anxiety caused by a perception of being under a spell has been argued to sometimes have such a paralyzing psychological effect that it ultimately contributes to severe illness or even death of the supposedly bewitched individual, a phenomenon known as “voodoo death.” Lester (2009) reviews such cases from around the world and argues that they are best understood through the lens of the “giving-up/given-up” complex. Convinced of their bewitchment, suffering extreme stress, feeling hopeless and effectively doomed to death, people are unable to cope and “give up” mentally and physically (often in the form of refusing food and drink), making themselves more vulnerable to disease. Commenting on “voodoo death,” Lévi-Strauss (1963) described how social abandonment of the allegedly bewitched individuals may further aggravate their personal anxiety. The victim “yields to the combined effect of intense terror” and the “withdrawal of the multiple reference systems provided by the support of the group,” as a result of which his “physical integrity cannot withstand the dissolution of the social personality.”

Contemporary ethnographic case studies continue documenting the negative side effects of witchcraft beliefs on social relations and psychological well-being. Ashforth (2005) vividly describes how witchcraft beliefs bring a “presumption of malice” to daily interactions among community members in Soweto, South Africa, revealing their “spiritual insecurity.” Kgatla (2007), also based on observations from South Africa, points out how the fear of witchcraft accusations and punishment that may follow constantly keeps people on edge. In nearby Botswana, witchcraft beliefs and accusations “destroy the harmony” in communities and “break human relations” (Ntloedibe-Kuswani, 2007). Such corrosive effects on social bonds and cooperation have been documented across contemporary Sub-Saharan Africa and beyond (Gershman, 2016). Thus, while religiosity has been linked to accumulation of social capital, with a positive impact on subjective well-being, witchcraft beliefs are more likely to have the opposite effect through this channel.

Beyond historical or contemporary case studies, there is little systematic evidence on the relationship of interest. Early psychometric research, typically based on small samples of college students, provided some evidence that certain beliefs in the supernatural, including witchcraft, are associated with an external locus of control (Irwin, 2009), in contrast to the findings on religiosity described earlier. Such perceived lack of personal agency and helplessness in the face of powerful witches may contribute to anxiety and diminished psychological well-being, consistent with ethnographic studies.

According to a Gallup news report based on a 2009 survey from 18 countries, “witchcraft believers in Sub-Saharan Africa rate lives worse” (Tortora, 2010), a claim investigated in much more detail in the next section. More recently, Gershman (2022a) examined cross-country relationships between the prevalence of witchcraft beliefs and various aspects of subjective well-being in a global sample. He found that witchcraft beliefs are inversely related to reported life satisfaction, subjective assessments of health, and positive emotional experiences. Furthermore, witchcraft beliefs are associated with a perceived lack of control over life and a pessimistic outlook manifested in a zero-sum worldview and lower self-efficacy. These cross-country correlations hold after accounting for income per capita, institutional quality, geography, religiosity, historical kinship ties, and continental fixed effects. However, this does not automatically imply that a similar pattern is present at the individual level. For example, the unit of analysis famously matters for the observed positive religiosity-happiness relationship which typically holds across people but not across countries (Deaton and Stone, 2013). As shown in the following sections, in the case of witchcraft beliefs, individual and country-level patterns point in the same direction.



### 3 Evidence from Sub-Saharan Africa

The first line of evidence comes from the African continent which has been the focus of vast research on witchcraft beliefs starting from the early twentieth century. We explore two waves of the Gallup World Poll (2009 and 2011) that included survey questions on both witchcraft beliefs and aspects of subjective well-being. These face-to-face surveys cover 33 countries representing the vast majority of the region’s population.<sup>1</sup> The Gallup World Poll is one of the main sources of global data on subjective well-being and forms the basis of the *World Happiness Report*.

The basic metric of life satisfaction comes from the standard “ladder-of-life” question: “Please imagine a ladder, with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time?” The other key question in our analysis simply asks whether respondents believe in witchcraft or not. Among those who gave a “yes” or “no” answer to this question, over 60% claimed to believe in witchcraft in the sample of almost 50,000 people. There is a lot of variation across countries, from less than 20% of “believers” in Rwanda and Uganda to over 90% in Côte d’Ivoire and Madagascar.

As mentioned in the previous section, a Gallup news report based on simple group mean comparisons for the 2009 wave of surveys (covering 18 countries and 18,000 people) highlighted that witchcraft believers in Sub-Saharan Africa displayed lower levels of life satisfaction. Here, we investigate this pattern more systematically in a regression setting, using a variety of well-being metrics, and for a much larger sample combining two survey waves. We follow the common empirical approach to investigating the determinants of subjective well-being (Nikolova and Graham, 2022) and set up our estimation equation as follows:

$$S_{i,c,t} = \alpha_c + \beta \text{witch}_{i,c,t} + \mathbf{X}'_{i,c,t}\mathbf{B} + \phi_t + \varepsilon_{i,c,t},$$

where  $i, c, t$  subscripts refer to respondent  $i$  in country  $c$  during survey wave  $t$ . The vector of control variables at the individual level is  $\mathbf{X}$ , country and wave fixed effects are denoted as  $\alpha_c$  and  $\phi_t$ , respectively, and  $\varepsilon_{i,c,t}$  is the idiosyncratic error term. The coefficient of

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<sup>1</sup>The following countries are part of the sample: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Côte d’Ivoire, Democratic Republic of the Congo, Eswatini, Gabon, Ghana, Guinea, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritius, Mozambique, Niger, Nigeria, Republic of the Congo, Rwanda, Senegal, Sierra Leone, South Africa, Tanzania, Togo, Uganda, Zambia, and Zimbabwe. Seventeen countries were surveyed in both waves.

interest,  $\beta$ , captures the association between personal belief in witchcraft,  $\text{witch}_{i,c,t}$ , and subjective well-being,  $S_{i,c,t}$ , conditional on other included factors. We assume cardinality of the life satisfaction measure and estimate the linear model using ordinary least squares (OLS), but ordered probit estimates yield the same qualitative results (Ferrer-i-Carbonell and Frijters, 2004).

The vector of control variables includes standard correlates of subjective well-being and witchcraft beliefs that could contaminate the relationship of interest. In the most comprehensive model specification, these are: age and its square, gender, marital status (married, divorced or separated, widowed, or never been married), religious affiliation (Christian, Muslim, other religion, or unaffiliated), education (five categories ranging from none to complete tertiary and above), and within-country per capita income quintile. Gershman (2022a) shows, in a global setting described in the next section, that some of these characteristics are important correlates of personal belief in witchcraft, and similar factors have been also identified as significant determinants of subjective well-being (Nikolova and Graham, 2022). Along with religious affiliation, we also account for religiosity (a binary measure capturing the importance of religion in life), both as a possible confounder and to contrast the estimates on religiosity and witchcraft beliefs in light of the earlier discussion. Country or, in an alternative specification, first-level subnational region fixed effects, capture relevant time-invariant factors at respective levels of aggregation, while wave fixed effects reflect any such year-specific characteristics.

Table 1 reports estimates for various model specifications. The first three columns correspond to the most parsimonious models with only age and gender controls, along with wave and country or region fixed effects. The estimated coefficient on belief in witchcraft is around  $-0.2$  and highly statistically significant. Inclusion of further control variables, especially education and per capita income quintiles, reduces the coefficient of interest, but leaves it strongly statistically significant, with the overall range of estimates falling roughly between  $-0.2$  and  $-0.1$ . These magnitudes do not appear particularly large implying that, other things equal, a witchcraft believer is, on average, about 0.1–0.2 steps lower on the “ladder of life.” However, the quantitative significance of witchcraft beliefs in this context is perhaps better gauged relative to other factors. For example, the absolute magnitude of 0.2 is comparable to the estimates on being divorced or separated (relative to being married), having 1–8 years of education (relative to none), and belonging to the second income quintile (relative to the first one).

Comparison to the role of religion and religiosity deserves special attention. Looking at religious affiliation in columns 5–8, it appears that Muslims (26.5% of the sample)

Table 1: Witchcraft beliefs and life satisfaction in Sub-Saharan Africa

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Belief in witchcraft	-0.221*** (0.018)	-0.192*** (0.020)	-0.201*** (0.020)	-0.188*** (0.020)	-0.181*** (0.020)	-0.135*** (0.020)	-0.105*** (0.020)	-0.122*** (0.020)
Age	-0.023 (0.029)	-0.002 (0.028)	-0.023 (0.027)	0.024 (0.031)	0.026 (0.032)	-0.103*** (0.032)	-0.120*** (0.032)	-0.121*** (0.032)
Age squared	-0.006* (0.003)	-0.009*** (0.003)	-0.004 (0.003)	-0.009** (0.004)	-0.009** (0.004)	0.008** (0.004)	0.010*** (0.004)	0.012*** (0.004)
<b>Gender:</b> woman	-0.035** (0.018)	-0.058*** (0.017)	-0.052*** (0.017)	-0.023 (0.018)	-0.033* (0.018)	0.038** (0.018)	0.045** (0.018)	0.053*** (0.018)
<b>Marital status:</b> vs. married								
Divorced or separated				-0.207*** (0.044)	-0.202*** (0.044)	-0.196*** (0.043)	-0.207*** (0.044)	-0.231*** (0.044)
Widowed				-0.324*** (0.041)	-0.323*** (0.041)	-0.242*** (0.041)	-0.237*** (0.041)	-0.243*** (0.040)
Never been married				0.044* (0.023)	0.044* (0.023)	-0.081*** (0.023)	-0.066*** (0.024)	-0.056** (0.024)
<b>Religion:</b> vs. Christian								
Muslim					-0.021 (0.029)	0.079*** (0.029)	0.060** (0.030)	0.053 (0.033)
Other					-0.228*** (0.053)	-0.143*** (0.052)	-0.112** (0.053)	-0.036 (0.056)
Unaffiliated					-0.347*** (0.079)	-0.251*** (0.078)	-0.169** (0.078)	-0.125 (0.078)
<b>Religiosity</b>					0.157*** (0.041)	0.120*** (0.040)	0.103** (0.042)	0.069* (0.042)
<b>Education:</b> vs. "none"								
1-8 years						0.198*** (0.027)	0.180*** (0.027)	0.182*** (0.026)
9 years to completed secondary						0.632*** (0.028)	0.507*** (0.029)	0.476*** (0.029)
1-3 years of tertiary						1.112*** (0.037)	0.856*** (0.039)	0.785*** (0.040)
4 years of tertiary and above						1.469*** (0.055)	1.131*** (0.058)	1.039*** (0.058)
<b>Income quintile:</b> vs. first								
Second							0.225*** (0.031)	0.226*** (0.030)
Third							0.303*** (0.030)	0.300*** (0.030)
Fourth							0.480*** (0.029)	0.457*** (0.030)
Fifth (richest)							0.799*** (0.029)	0.758*** (0.030)
Observations	48495	48495	46490	48396	48046	47830	44961	42995
Wave FE		✓	✓	✓	✓	✓	✓	✓
Country FE		✓		✓	✓	✓	✓	
Region FE			✓					✓

*Notes.* The dependent variable is life satisfaction score measured on a 0-10 ordinal scale. OLS estimates are reported in all columns. Heteroskedasticity-robust standard errors shown in parentheses. \*\*\*, \*\*, and \* denote statistical significance at the 1, 5, and 10 percent level, respectively. Age is measured in tens of years. The number of observations for each specification reflects data availability constraints.

tend to be a bit more satisfied with their lives compared to Christians (68.5% of the sample) after accounting for education and/or income, whereas representatives of all other religions (constituting less than 4% of the sample) are less satisfied. Those without religious affiliation (just above 1% in total) also show a lower level of life satisfaction, consistent with the role of religion found in the literature. The estimate on religiosity is also positive and significant.<sup>2</sup> Quantitatively, having a religious affiliation and considering religion as an important part of life appear to matter roughly as much for life satisfaction as believing in witchcraft, but with the opposite sign. This highlights that beliefs in different supernatural forces vary in terms of their relation to subjective well-being.

The estimates for other socio-demographic factors are consistent with those typically reported in the literature. Higher levels of education and income are strongly positively related to subjective well-being. In the most comprehensive specifications, married people and women report higher levels of life satisfaction, and the relationship with age is U-shaped (Blanchflower, 2021).

As discussed in section 2, perception of being under a spell and fears of witchcraft attacks or accusations have been argued to generate stress, anxiety, and paranoia, presumably translating into diminished psychological well-being. On the other hand, early studies suggested that attributing misfortune to witchcraft may relieve anxiety. We explore this issue by looking at a range of Gallup World Poll questions that elicit recent emotional experiences of respondents, both positive and negative. Such measures capture the short-term, “affective” dimension of well-being rather than a longer-term stance on one’s overall life circumstances (Nikolova and Graham, 2022). Specifically, the survey inquired about experiencing stress, worry, sadness, anger, happiness, enjoyment, and smiling or laughing during the previous day. We use the “yes” or “no” responses to these questions as dependent variables in regression equations that are otherwise identical to specifications in columns 6 and 7 of table 1. In addition, we look at another relevant binary variable measuring satisfaction with the freedom to make life choices. This measure to some extent captures the prominence of internal versus external locus of control, which is one of the mechanisms highlighted in the debate about the impact of supernatural beliefs on psychological well-being.

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<sup>2</sup>Note that only 6% of respondents said that religion was *not* important in their life. For a small subsample of about one third of the original dataset, a binary variable capturing attendance of religious services is available. In specifications equivalent to those in columns 5–8 of table 1, but with this alternative measure of religiosity, the coefficient estimates for both religiosity and witchcraft belief are quantitatively very similar to the baseline.

The results for these additional eight metrics are shown in table 2, which only displays the coefficients of interest, namely, on the belief in witchcraft and religiosity. The top row of the table shows that witchcraft believers are, on average, more likely to experience negative emotions, particularly stress and worry, whereas religiosity appears to mitigate them. Similarly, witchcraft believers are less likely (and highly religious people are more likely) to experience happiness, enjoyment, and laughter, as shown in the bottom row of the table. The last panel, in the bottom-right corner, shows that witchcraft beliefs are also negatively related to the perceived freedom of making life choices, once again in contrast to religiosity. Interestingly, in a “horse race” regression of life satisfaction on the witchcraft and freedom of choice variables, along with the full set of controls, both are highly statistically significant and enter with a negative and a positive coefficient, respectively. Moreover, the estimate for witchcraft belief in this regression remains very similar to that reported in column 7 of table 1. Though not a definitive test, the perceived loss of control over life does not seem to “explain away” even part of the negative association between witchcraft beliefs and life satisfaction.<sup>3</sup>

Overall, this series of results is consistent with a negative impact of witchcraft-related fears on “affective” well-being and perceived control over life. Quantitatively, other things equal, believing in witchcraft is associated with an average increase in the incidence of stress and worry by 2–3 percentage points and a reduction, roughly similar in magnitude, of experienced happiness and enjoyment. Naturally, these findings are correlational and should be interpreted as such. One might even argue that causality runs in the opposite direction: stressed out, worried, and unhappy people are more likely to believe in witchcraft, with such a supernatural attribution providing an “explanation” for their miseries and a coping mechanism of sorts. However, in this case, contrary to evidence, one would also expect anxiety to be associated with a higher commitment to religion, which provides an alternative supernatural-based coping mechanism. Thus, although a two-way causal relationship is certainly conceivable, a simple explanation for the contrasting results for witchcraft beliefs and religiosity lies in their conceptually distinctive impacts on subjective well-being.

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<sup>3</sup>Motivated by evidence on the corrosive effects of witchcraft beliefs on social relations (Gershman, 2016), we also ran a similar regression of life satisfaction on witchcraft belief and a standard measure of generalized trust (in a small subsample of the dataset for which trust data are available). Although trust itself is positively related to life satisfaction, accounting for it does not affect the negative estimate on witchcraft belief. Thus, there is no indication from the “horse race” exercises that either trust or loss of control represent mediating channels or confounders in the relationship of interest.

Table 2: Witchcraft beliefs, emotional experiences, and freedom of life choices

	Stress		Worry		Sadness		Anger	
Belief in witchcraft	0.021*** (0.004)	0.021*** (0.004)	0.026*** (0.004)	0.025*** (0.005)	0.013*** (0.004)	0.011*** (0.004)	0.008** (0.004)	0.007* (0.004)
Religiosity	-0.026*** (0.009)	-0.028*** (0.009)	-0.040*** (0.010)	-0.035*** (0.010)	-0.051*** (0.008)	-0.041*** (0.009)	-0.039*** (0.008)	-0.038*** (0.009)
Observations	49940	45878	50002	45932	49973	45908	50001	45936
	Happiness		Enjoyment		Laugh or smile		Freedom of choice	
Belief in witchcraft	-0.039*** (0.004)	-0.030*** (0.005)	-0.024*** (0.005)	-0.017*** (0.005)	-0.020*** (0.004)	-0.019*** (0.005)	-0.013*** (0.005)	-0.012** (0.005)
Religiosity	0.078*** (0.010)	0.067*** (0.010)	0.076*** (0.010)	0.062*** (0.010)	0.070*** (0.010)	0.062*** (0.010)	0.058*** (0.010)	0.050*** (0.010)
Observations	49918	45867	50006	45935	49866	45798	49804	45748
Country and wave FE	✓	✓	✓	✓	✓	✓	✓	✓
Education and income		✓		✓		✓		✓

*Notes.* The eight binary dependent variables reflect positive and negative emotional experiences and satisfaction with freedom to make life choices, as indicated in panel titles. OLS estimates are reported in all columns. Heteroskedasticity-robust standard errors shown in parentheses. \*\*\*, \*\*, and \* denote statistical significance at the 1, 5, and 10 percent level, respectively. Each specification also includes the following socio-demographic controls (estimates not shown): age and its square, gender, marital status, religious affiliation. The number of observations for each specification reflects data availability constraints.

## 4 Evidence from around the world

The second line of evidence comes from a global dataset compiled by Gershman (2022a) and covering more than 140,000 individuals from 96 countries and territories around the world.<sup>4</sup> This dataset is a compilation of six survey waves conducted by the Pew Research Center over the decade between 2008 and 2017. Unlike the Gallup World Poll, these surveys did not contain standard subjective well-being or emotional experience questions covering the entire sample. The following question comes closest: “Overall, are you satisfied or dissatisfied with the way things are going in our country today?” While understanding its limitations and a specific angle, we rely on responses to this question as an indirect measure of subjective well-being or a person’s optimistic/pessimistic outlook more generally. As for measuring witchcraft beliefs, in the baseline analysis, we use the only relevant question available across the full dataset: “Do you believe in the evil eye, or that certain people can cast curses or spells that cause bad things to happen to someone?” Despite the somewhat inaccurate reference to the evil eye belief (Gershman, 2015), the second part of this question corresponds exactly to the relevant concept of witchcraft (unlike the Gallup World Poll

question that leaves it more open to interpretation by respondents). As explored in detail by Gershman (2022a), there is substantial variation in the country-level prevalence of witchcraft beliefs, from 9% in Sweden to 90% in Tunisia.

We keep the overall empirical setting as close as possible to that of the previous section, with the following necessary adjustments. First, some of the control variables are coded differently. Specifically, education is a categorical variable with three possible values (primary or less, secondary, above secondary) and religiosity, or the importance of religion in life, is measured on a 1–4 ordinal scale (from not at all to very important). Second, it is not possible to include survey wave and country fixed effects simultaneously since each country in the sample was only covered once.<sup>5</sup> Third, due to the absence of consistent subnational region identifiers, we only run specifications with country fixed effects. Finally, there is no information on income per capita, and the closest variable, only available for a subsample of the dataset, is the self-reported “personal economic situation” measured on a 1–4 ordinal scale (from very bad to very good). For consistency with the previous section, we estimate linear probability specifications using OLS, but the marginal effects from a binary choice probit model are very similar.

Table 3 shows the estimation results. A parsimonious specification with country fixed effects, age, and gender controls (column 2) implies that witchcraft believers are about 2.5 percentage points less likely to be satisfied with the way things are going in their country. Accounting for additional socio-demographic characteristics such as marital status, religion, religiosity, and education has virtually no impact on the coefficient of interest (columns 4–6). It shrinks in magnitude by about 50%, but remains statistically significant, after controlling for personal economic situation, a metric of subjective material well-being.

As in the previous section, the negative estimate for witchcraft belief is in contrast to the positive (and comparable in magnitude) estimate for religiosity. Looking at religious affiliation, Muslims (29% of the sample) appear to be somewhat more satisfied relative to Christians (60%) and the unaffiliated (10%). Consistent with the results from Sub-Saharan Africa, married and more economically secure people report higher levels of satisfaction, while there is a U-shaped pattern for age. However, women report lower levels of satisfac-

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<sup>4</sup>Compared to the analysis of this section, Gershman (2022a) omits the surveys from Kosovo and Muslim regions of Thailand, but includes Greece, for which no data on subjective well-being are available. The global sample includes 20 countries in Sub-Saharan Africa.

<sup>5</sup>Waves correspond to years 2008–2009, 2011–2012, 2013–2014, 2015–2016, and 2017. By design, to a certain extent, waves also correspond to continents or large world regions. Hence, we opt for country fixed effects in baseline specifications. See Gershman (2022a) for a detailed description on the dataset.

Table 3: Witchcraft beliefs and satisfaction with the “way things are going” in the country

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Belief in witchcraft	-0.079*** (0.003)	-0.024*** (0.003)	-0.034*** (0.003)	-0.023*** (0.003)	-0.026*** (0.003)	-0.026*** (0.003)	-0.012*** (0.003)
Age	0.015*** (0.004)	-0.032*** (0.004)	-0.020*** (0.004)	-0.039*** (0.004)	-0.039*** (0.005)	-0.041*** (0.005)	-0.010** (0.005)
Age squared	-0.002*** (0.000)	0.003*** (0.000)	0.001*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.001 (0.001)
<b>Gender:</b> woman	-0.028*** (0.003)	-0.014*** (0.002)	-0.018*** (0.003)	-0.014*** (0.002)	-0.015*** (0.003)	-0.015*** (0.003)	-0.019*** (0.003)
<b>Marital status:</b> vs. married							
Divorced or separated				-0.046*** (0.005)	-0.042*** (0.005)	-0.040*** (0.005)	-0.014** (0.006)
Widowed				-0.003 (0.005)	-0.002 (0.006)	-0.002 (0.006)	-0.003 (0.007)
Never been married				-0.020*** (0.004)	-0.019*** (0.004)	-0.017*** (0.004)	-0.007* (0.004)
<b>Religion:</b> vs. Christian							
Muslim					0.039*** (0.007)	0.040*** (0.007)	0.029*** (0.007)
Other religion					0.040** (0.020)	0.041** (0.020)	0.016 (0.022)
Unaffiliated					0.002 (0.006)	0.000 (0.006)	-0.001 (0.006)
<b>Imp. of religion:</b> vs. “not at all”							
Not too important					0.029*** (0.006)	0.028*** (0.006)	0.029*** (0.007)
Somewhat important					0.044*** (0.006)	0.043*** (0.006)	0.034*** (0.007)
Very important					0.037*** (0.006)	0.035*** (0.006)	0.023*** (0.007)
<b>Education:</b> vs. “none”							
Secondary						-0.010*** (0.004)	-0.031*** (0.004)
Above secondary						0.004 (0.004)	-0.047*** (0.004)
<b>Econ. situation:</b> vs. “very bad”							
Somewhat bad							0.064*** (0.004)
Somewhat good							0.310*** (0.004)
Very good							0.470*** (0.006)
Country FE		✓		✓	✓	✓	✓
Wave FE			✓				
Observations	131998	131998	131998	131040	127551	125372	97066

*Notes.* The binary dependent variable reflects satisfaction with the “way things are going” in the country. OLS estimates are reported in all columns. Heteroskedasticity-robust standard errors shown in parentheses. \*\*\*, \*\*, and \* denote statistical significance at the 1, 5, and 10 percent level, respectively. Age is measured in tens of years. The number of observations for each specification reflects data availability constraints.



tion, and so do those with better education, perhaps reflecting their higher awareness of countrywide issues and problems.

The data available from the Pew Research Center surveys allow for further robustness checks based on alternative definitions of witchcraft belief and enable comparison to some other beliefs in the supernatural. Specifically, in addition to the baseline witchcraft question, certain survey waves also included one of the other two relevant questions previously employed by Gershman (2016; 2020). The first such alternative question simply asks whether respondents believe in witchcraft, without specifying what that means (just as in the Gallup World Poll case from section 3). The second alternative question inquires about a somewhat broader belief that “magic, sorcery or witchcraft can influence people’s lives.” Not surprisingly, responses to these two alternative questions are highly correlated at the individual level with responses given to the baseline witchcraft question, with tetrachoric correlation coefficients of 0.66 and 0.69, respectively. To test the robustness of our results, we estimate specifications from columns 6 and 7 of table 3 after replacing the baseline witchcraft variable by one of the two alternatives.

As shown in the first two panels of table 4, despite a substantial reduction in sample size due to data availability, there is a significant negative association between both alternative measures of witchcraft beliefs and reported satisfaction with the way things are going in the country. The remaining panels of the table show the relevant coefficient estimates from equivalent model specifications for other supernatural beliefs. Interestingly, they are negative for all variations of belief in life after death (heaven, hell, and reincarnation), although statistical significance is lost after accounting for personal economic situation. In less demanding specifications, the absolute magnitude of estimates for these beliefs is substantially smaller compared to the case of witchcraft, however defined. Beliefs in angels and astrology (“that the position of the stars and planets can affect people’s lives”) are unrelated to the outcome variable.

Finally, the estimates for belief in fate, possibly reflecting a predominant external locus of control, are negative and significant. It is worth pointing out that, among all supernatural beliefs in table 4, it is precisely fatalism that is most highly correlated with belief in witchcraft, with a tetrachoric correlation of 0.58 for the baseline measure, and this positive association remains after accounting for confounders and country fixed effects.<sup>6</sup> This is in line with the analysis of previous section showing a negative relationship between witchcraft

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<sup>6</sup>The correlations between witchcraft beliefs and other supernatural beliefs are all positive, but substantially smaller in magnitude, from the lowest of 0.22 for belief in heaven to the highest of 0.37 for astrology, based on samples maximizing the available number of observations.

Table 4: Supernatural beliefs and satisfaction with the “way things are going”

	Witchcraft I		Witchcraft II		Heaven		Hell	
	-0.031*** (0.005)	-0.013*** (0.005)	-0.023*** (0.004)	-0.011** (0.005)	-0.012** (0.005)	0.003 (0.006)	-0.010*** (0.004)	-0.001 (0.004)
Observations	47023	46664	53191	27478	99580	74048	98624	73261
	Reincarnation		Angels		Astrology		Fate	
	-0.009*** (0.003)	-0.004 (0.004)	-0.006 (0.005)	0.004 (0.005)	-0.002 (0.004)	0.002 (0.004)	-0.029*** (0.004)	-0.016*** (0.005)
Observations	96478	69909	75719	75161	51416	49354	74199	48092
Country FE	✓	✓	✓	✓	✓	✓	✓	✓
Economic situation		✓		✓		✓		✓

*Notes.* This table provides estimates from specification identical to those in columns 6 and 7 of table 3, but in which the baseline witchcraft belief variable is replaced by one of the eight alternatives indicated in the panel titles. Witchcraft I and II labels refer to alternative measures of witchcraft beliefs as explained in the main text. OLS estimates on respective beliefs are reported in all columns. Heteroskedasticity-robust standard errors shown in parentheses. \*\*\*, \*\*, and \* denote statistical significance at the 1, 5, and 10 percent level, respectively. Each specification also includes the following socio-demographic controls (estimates not shown): age and its square, gender, marital status, religious affiliation, religiosity, and education. The number of observations for each specification reflects data availability constraints.

beliefs and satisfaction with the freedom to make life choices, another metric of perceived control over life. In “horse race” specifications, when beliefs in witchcraft and fate are simultaneously included as “independent” variables, both remain individually significant, with negative coefficient estimates (as was the case in a similar exercise from section 3). Overall, along with fatalism, witchcraft beliefs appear to show a significantly more robust pattern of correlation with this section’s measure of subjective well-being compared to other supernatural beliefs.

## 5 Conclusion

A vast interdisciplinary literature considers many channels through which religion affects policy-relevant socioeconomic outcomes such as health, education, and income. Beyond these standard indicators, the link between religion and subjective well-being is justifiably receiving a lot of attention, particularly given recent calls to consider improvements in personal well-being, broadly defined, as an overarching public policy goal (Frijters et al., 2020). This chapter further argues that the notion of religion that has dominated this area of study is too narrow and should be extended to include a variety of supernatural beliefs.

We focused specifically on witchcraft beliefs, previously shown to be systematically related to a number of characteristics at the individual, ethnic, regional, and country levels. We showed that there is a robust negative association between personal belief in witchcraft, or the ability of certain people to cause harm supernaturally, and metrics of subjective well-being, consistent with ethnographic case studies and cross-country patterns. Witchcraft believers are more stressed, worried, and sad. They stand lower on the “ladder of life” and feel less satisfied with how things are going in their country. They are also more likely to have an external locus of control. From a policy perspective, anxiety fueled by witchcraft beliefs contributes to their social costs that should be considered when holistically assessing the local cultural landscape prior to implementation of policy changes or development programs (Gershman, 2022a).

The findings of this chapter contrast the typically observed positive role of religion and religiosity in alleviating anxiety and boosting life satisfaction, which underscores the importance of differentiating between various types of supernatural beliefs in this context. Quantitatively, the estimated contribution of witchcraft beliefs is not large, but comparable in magnitude to that of religiosity and other socio-demographic characteristics. The correlations reported in this chapter hold for different measures of well-being and definitions of witchcraft beliefs, across two independent datasets, and after accounting for a range of potentially confounding characteristics. These findings provide substantial motivating evidence for further exploration, particularly using experimental methods, of the connection between witchcraft beliefs and subjective well-being.

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