The Moralization Bias of Gods' Minds: A Cross-Cultural Test

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Abstract

There are compelling reasons to expect that representing any active, powerful god or spirit may contribute to cooperation. One possible mechanism underlying this effect is a system that infers that spiritual agents are morally concerned. If individuals cognitive represent deities as agents, and if agents are generally conceptualized as having moral concern, a broad tendency to attribute moral concern–a "moralization bias"–to supernatural deities follows. Using data from 2,229 individuals in 15 different field sites, we test for the existence of such a bias. We find that people are indeed more likely than not to indicate that supernatural deities are concerned with punishing immoral behavior in the form of theft, murder, and deceit, an effect that is stable even after holding constant the influence of explicitly moralistic deities. We also find that when deities are *not* associated with morality, communities socially sanction commitment to them. We posit that the moralization bias of gods' minds is part of a widespread but variable religious phenotype, and a candidate mechanism that contributes to the well-recognized association between religion and social harmony.

Keywords: supernatural punishment, morality, gods' minds, cognitive science of religion

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1. Introduction

1.1. Background

There is considerable evidence that features of religion mediate human relationships. Whether through ritual (Power, 2017a,b; Soler, 2012; Sosis and Bressler, 2003), or explicit beliefs (McNamara et al., 2016; Purzycki et al., 2016; Lang et al., 2019), religion contributes to cooperation and coordination in important ways. Considerable cross-cultural research on beliefs focuses on the emergence, persistence, and ubiquity of "moralistic" or "morally concerned" gods (Baumard et al., 2015; Botero et al., 2014; Johnson, 2005; Peoples and Marlowe, 2012; Purzycki et al., 2016; Swanson, 1964; Watts et al., 2015a). Many of these studies assume or explicitly state that morally concerned deities are relatively unique in the ethnographic world, and are associated with the rise of the world religions like Judaism, Christianity, and Islam. Others suggest that the association with gods and moral interests is relatively ubiquitous, and many posit that this deep relationship can account for why gods are socially relevant (Boyer, 2000, 2008; Johnson, 2015). As we review below, there are theoretical and empirical reasons to suspect that the relationship between religious beliefs and morality is neither unique nor tenuous. Specifically, if individuals exhibit biases toward inferring that other minds are moralistic, and if supernatural deities are conceptualized as minds, then it would imply that belief in moralistic deities is more widespread than previous work suggests.

How likely is it that people associate moral concern among their deities? How ubiquitous is this association? What are some factors that account for its variation? In this report, we address these questions. We first discuss the contemporary anthropological, cognitive, and evolutionary literature on moralistic supernatural punishment and the evolution of cooperation. We then assess the cognitive foundations of mentalizing and its close link to moral cognition. Following this, we present our cross-cultural study assessing the degree to which people associate supernatural deities with moralistic punishment across 28 deities from 15 ethnographically distinct societies from around the world. We conclude with a discussion of implications that our study poses for current work on the social scientific study of religion.

1.2. Moralistic supernatural punishment and the evolution of sociality

One ongoing–and old–debate revolves around the relationship between morality, gods, and social complexity (Beheim et al., 2019; Evans-Pritchard, 1965; Hartland, 1898; Johnson, 2015; Lang, 1909; Lang et al., 2019; Norenzayan, 2013, 2015; Peoples and Marlowe, 2012; Purzycki et al., 2016; Purzycki, 2011; Schloss and Murray, 2011; Swanson, 1964; Whitehouse et al., 2019; Watts et al., 2015a). According to one view, by virtue of the anonymity afforded by increased population density and more distantly distributed social networks, normative belief in a moralistic god monitoring and governing everyone may facilitate more predictable and broader cooperation (e.g., Peoples and Marlowe, 2012; Watts et al., 2015a). Another view (e.g., Norenzayan, 2013; Norenzayan et al., 2016) emphasizes the converse; smaller-scale societies are less likely to have powerful, knowledgeable, "moralistic" deities, but when present, commitment to such deities may help to widen the scope of cooperation, in turn leading to larger social organizations and more widespread beliefs in such deities. At least rhetorically, neither perspective denies the co-evolution of social complexity and the frequency of belief in moralizing gods, but disagreements persist over the ubiquity, nature, and

scope of moralistic supernatural punishment[1]. However, some non-trivial problems lurk beneath the view that there is a relationship between morally concerned deities and social complexity (see Beheim et al., 2019; Purzycki and Watts, 2018, for more developed discussions).

First, crude and problematic group-level data have had a strong influence on our sense of worldwide variation in religious beliefs (Purzycki and Watts, 2018). Too few studies have directly and systematically asked individuals if their gods care about human morality and its breadth with explicitly defined and transparent methods for this purpose (cf. Purzycki, 2011; Lang et al., 2019). Indeed, virtually all cross-cultural studies focused on–and finding–a relationship between social complexity and moralistic gods relies on data coded from old qualitative ethnographies, and reports from missionaries and travelers (e.g., Botero et al., 2014; Murdock and White, 1969; Watts et al., 2015b). These codes have historically focused on the presence of "high gods"–*creator* deities–and whether or not they are "specifically supportive of human morality." The status of gods as creators is not theoretically relevant to the research questions of interest, and coding deities in this way likely excluded cases where moralistic deities are *not* creator deities. Moreover, the coding scheme of these sources lumps "absent" high gods with "not reported" in the selected resources. Additionally, these data characterize entire groups as having or not having a particular belief, despite belief being an individual-level trait that varies within groups. In other words, textual sources that do not comment on moralistic high gods are treated the same as definite claims of absence in other sources. Furthermore, more focused assessments of ethnographies of small foraging groups suggest that supernatural sanctions typically revolve around interpersonal social norms that could be construed as "moral" (cf. Boehm, 2008; Swanson, 1964).

A second set of issues stems from the association between moral cognition and the perceptual systems responsible for detecting minds. Even when considering variation across the sexes and the autism spectrum, humans' ability to make sense of other minds is without equal in the animal kingdom (Baron-Cohen, 1995; Baron-Cohen et al., 2001; Call and Tomasello, 2008; Penn and Povinelli, 2007a,b; Premack and Woodruff, 1978; Saxe, 2006; Zeestraten et al., 2017). Individuals effortlessly view others around them as agents motivated by beliefs, emotions, and desires. People use this understanding to determine how to act towards others. People can comfort each other when they are upset, they can do things to make others happy, and they can change their behavior if it angers others.

Some social psychologists suggest and partly demonstrate that moral psychology is deeply intertwined with the perception of other minds (Gray and Wegner, 2011; Gray et al., 2012). As empathy facilitates making decisions that others might deem "good" and avoiding those that others might

[1]Supernatural punishment may have contributed to the evolution of human cooperation by reducing the costs involved in the secular punishment of "immoral" behavior and/or by expanding the scope of cooperation beyond kith and kin. By harnessing pan-human cognitive systems responsible for curbing immoral behavior, belief in powerful spiritual beings appears to reduce the chances that devotees defect on social norms. If so, such beliefs may contribute to individual reproductive success by softening the blows of social life (Johnson, 2016; Schloss and Murray, 2011; Shariff, 2017). They may also lead groups with such norms to out-compete other groups with higher levels of intra-group conflict due to a higher frequency of immoral behavior in intra-group interactions (Bowles, 2008; Richerson et al., 2016; Norenzayan et al., 2016). Of course, what constitutes "morality" varies considerably across sources (see Purzycki, et al. 2018b for a review). Here, following Alexander (1987), we use the term to refer to inter-individual behaviors that have immediate costs or benefits to others (e.g., murder, theft, deceit, generosity, honesty, and kindness). This conception of the "moral" presumes neither parochial nor universal applicability. Rather, this view would require the additional, explicit measurement of what we might call "moral breadth". As such, "moralistic gods" here are gods that care about morality, leaving the "moral to whom?" question open.

deem "bad," being able to adopt the perspective of others likely facilitates prosocial relationships (Imuta et al., 2016). Moral behavior, as often defined, requires an understanding of the intentions and expectations of someone else, and thus the ability to reason about—or from the perspective of—someone else's mind (Young and Phillips, 2011; Young and Saxe, 2011). Some researchers have taken this further to suggest that morality is didactic in nature; when we see some misfortune as a moral punishment, we infer that the punishment is caused by some agent, often a supernatural one (Gray and Wegner, 2010). Taken together, this research suggests that when we perceive minds—especially if those minds are individuals in our social group—then we should expect those minds to care about our moral behavior and to potentially punish us when we violate moral norms. Despite cultural variation in their explicit concerns, this effect appears to extend to gods' minds as well.

1.3. The mechanics of moralizing human and divine minds

Our ability to "detect" the mental states of *unseen* agents may be deeply ancestral. From Darwin's dog (Darwin, 1871) to Guthrie's (1980; 1995) theory of religion as anthropomorphism, scholars and scientists alike have recognized that one of religion's core elements is the representation of spiritual agency, made possible in part by our unprecedented mentalizing abilities and our ability to socially transmit notions of perceived agency. Contemporary research suggests that various forms of mentalizing—including anthropomorphism—predict religiosity. Deficits—but not necessarily *accuracy* (Vonk and Pitzen, 2017; Reddish et al., 2015)—in mentalizing predict lower religiosity (Norenzayan et al., 2012). Others have found that prayer engages the neurological correlates of social cognition (Schjoedt et al., 2009), suggesting that communicating with spiritual agents is physiologically similar to communicating with actual flesh-and-blood agents.

People appeal to the minds of gods in a variety of contexts, but the concerns that they appear to attribute to the gods are neither arbitrary nor mere projections of their personal interests. Some have recognized that gods appear to be especially attuned to "socially strategic knowledge" (Boyer, 2000; Purzycki et al., 2012) and recent research has begun to examine precisely *which* domains of such knowledge become explicitly associated with supernatural beings (Boehm, 2008; Purzycki, 2016; Purzycki and McNamara, 2016). In addition to moral concerns, people appear to limit the concerns of their deities to ritual, etiquette, sexual mores, and resource management (Brown, 1952; Purzycki and McNamara, 2016). The links between religious beliefs, behavior, and morality appear to be manifold and in some cases quite strong (Lambek, 2012; McKay and Whitehouse, 2014; Stark, 2001). Yet, by virtue of the aforementioned cognitive link between moral cognition and mentalizing, it is plausible that reasoning about gods' minds triggers moral cognition, regardless of the culturally postulated concerns of such gods (Cohen and Rozin, 2001; Purzycki, 2013). Considerable evidence suggests the presence of such a mechanism.

While there is mixed experimental evidence regarding the degree to which the feeling of being watched by artificial observers alters cooperative behavior (Bateson et al., 2006; Haley and Fessler, 2005; Krátký et al., 2016; Nettle et al., 2013; Northover et al., 2016, 2017; Raihani and Bshary, 2012), some experiments suggest that when children (Piazza et al., 2011) and adults (Bering et al., 2005; Hadnes and Schumacher, 2012; Lang et al., 2019; McNamara et al., 2016; Purzycki et al., 2016; Shariff and Norenzayan, 2007, 2011; Yilmaz and Bahçekapili, 2016) are primed with concepts of spiritual beings, they tend to break fewer rules and engage in more equitable behavior. Cross-national studies using aggregate, group-level data also suggest that this is the case (Atkinson and Bourrat, 2011; Stark, 2001). Even when experiments use underspecified gods or ghosts as primes, people appear to break fewer rules on average when entertaining the presence of such agents.

Other studies point to the intuitiveness of associating cognitive moral domains and the minds of gods or god-like beings. For example, Purzycki et al. (2012) found that American adults are quicker to answer questions about various omniscient agents' knowledge of moral information than non-moral information, suggesting an intuitive relationship between moral domains and reasoning about agents with superhuman knowledge access. Even when reasoning about the knowledge of a fictitious, omniscient but non-interfering alien species, people are quicker to respond to questions about their knowledge of human moral behavior. American Christians who believe God is omniscient are more confident that he knows about moral acts than mundane information (Purzycki, 2013). Tyvans from southern Siberia explicitly claim that local spirits are predominantly associated with concerns of ritual and environmental maintenance (Purzycki, 2016). However, when asked specifically targeted questions about local spirits' moral interests (e.g., "Does the spirit know if I hurt someone?"), Tyvans were more likely than not to claim that these otherwise non-morally concerned, non-omniscient deities knew and cared about a range of moral behaviors, especially those conducted in their vicinity (Purzycki, 2011). While spirits may be culturally associated with very specific domains, relative to non-moral information, people may nevertheless infer that spirits know and care about important (im)moral behaviors of people, even when they occur beyond their explicitly held domains of governance.

1.4. Predictions

If reasoning about minds triggers moral cognition, and we perceive spiritual deities as minds, it follows that when people reason about the mental states of supernatural deities, there should be a reliably positive estimate for the probability that respondents claim that such deities care about moral behavior. Regardless of their culturally-specified domain of concern, belief in supernatural deities may engage regulatory cognition responsible for minimizing costly "immoral" behavior. As minds are generally held to be concerned with human conduct, moral cognition may lurk beneath the surface by virtue of that concern, rendering the processing and likely adoption of morally concerned god concepts easier. If it is the case that on average, people are inclined to claim that their deities care about human moral conduct, it would suggest that–descriptively and/or functionally–moralistic supernatural punishment is considerably more ubiquitous than previous work suggests.

A strong evaluation of this hypothesis would test for the existence of a moralization bias in the concerns attributed to gods that are viewed less as enforcers of morality than their relatively more moralistic counterparts. This effect should be evident even when holding constant—as much as one can—any influence of belief in explicitly moralistic deities. Concurrent belief in Christianity, for example, might influence responses about local deities due to: 1) its imperialistic history, 2) its varied reception among native populations, 3) its often antagonistic relationship with local traditions and deities, and 4) its alleged relative focus on morality (i.e., it is a prototypical "moralistic tradition").

Although it is not the main focus of our study to evaluate the roles of sex, age, and formal education on the extent to which individuals attribute moral concern to supernatural deities, we include these variables in some models as a robustness check. If males are systematically less adept at mentalizing (Baron-Cohen and Wheelwright, 2004) and—by extension—moralizing other minds (Gray et al., 2012), it follows that men should be less inclined to claim that local deities care about morality. Likewise, if as one ages, one is more likely to adopt culturally prototypical beliefs (see, for example, Shaver and Sosis, 2014), then we should see a negative effect of age on the likelihood that

respondents report that local deities care about morality. Similarly, years of formal education may move responses toward answering in the culturally "correct" manner (Purzycki, 2016). In other words, relatively older, better educated, and male participants should be less likely to claim that locally salient deities care about moral behaviors.

2. Study

This project was part of the Evolution of Religion and Morality Project, a project designed to test hypotheses about the relationship between religion and cooperation. Methods protocols are available at https://osf.io/epkbw/ and all data and code needed to reproduce our findings are available at http://bgpurzycki.github.com. We collected all focal data here during post-experimental general demographic and religiosity interviews.

2.1. Participants

Our working data set consists of 2,229 participants from 15 diverse populations (Figure 1). We collected data over two waves in 2013 and 2015. Two of the 15 sites in the sample lack data for local deities (Lovu and Samburu), and the methods from one site are different, partly due to participants' difficulty with scales (Hadza). Table 1 provides a descriptive overview of our focal variables by site. We compensated participants with roughly 25% of the local average *per diem* wage (except for the Hadza, who were compensated with maize), and participants could earn more money in experiments for a maximum total of 75% the average daily wage (see Lang et al., 2019; Purzycki et al., 2016). Participation took a total of around 90 minutes per person.

Table 1: **Means (standard deviations) for target demographic variables and indices by site.** Moral index values are by-site means and standard deviations for the frequency of non-zero responses to the questions assessing the importance of moralistic punishment to each deity. *Denotes that these sites used different local deities across individuals.

Site	N	Males	Age	Yrs. Ed.	Moralistic Deity	Moral Index (MD)	Local Deity	Moral Index (LD)
Cachoeira	274	83	34.2 (12.9)	8.6 (4.0)	Christian god	0.79 (0.41)	Ogum	0.71 (0.45)
Coastal Tanna	178	88	35.1 (14.3)	7.8 (4.2)	Christian god	0.86 (0.35)	Garden spirit	0.83 (0.37)
Hadza	201	101	38.8 (13.7)	1.7 (3.0)	Haine	0.48 (0.50)	Ishoko	0.37 (0.48)
Huatasani	94	37	38.5 (15.9)	9.0 (3.8)	Christian god	0.64 (0.48)	Mountain spirits/saints*	0.43 (0.50)
Inland Tanna	112	57	36.2 (15.4)	0.7 (2.0)	Kalpapan	0.86 (0.35)	Garden spirit	0.83 (0.38)
Kananga	200	79	38.1 (14.5)	9.5 (3.3)	Christian god	0.92 (0.28)	Kadima/ancestor spirits*	0.37 (0.48)
Lovu	76	24	44.6 (16.9)	8.8 (3.8)	Shiva	0.99 (0.11)	—	—
Marajó	77	37	34.1 (13.1)	8.0 (3.5)	Christian god	0.87 (0.33)	Saint Mary	0.81 (0.39)
Mauritius	245	144	36.9 (15.8)	8.8 (3.6)	Shiva	0.82 (0.38)	Nam (a spirit)	0.47 (0.50)
Mysore	165	94	33.6 (12.3)	13.4 (5.4)	Shiva	0.85 (0.35)	Chamundeschwari	0.86 (0.35)
Samburu	40	12	51.3 (12.5)	0.7 (1.8)	Christian god	0.89 (0.31)	—	—
Sursurunga	163	73	37.6 (14.1)	7.5 (2.6)	Christian god	0.95 (0.22)	Forest spirit	0.21 (0.41)
Turkana	247	91	38.0 (16.4)	0.5 (1.2)	Christian god	1.00 (0.07)	Ancestor spirits	0.36 (0.48)
Tyva	81	23	33.5 (12.5)	15.4 (2.3)	Buddha Burgan	0.90 (0.30)	Spirit-masters	0.92 (0.28)
Yasawa	75	34	38.0 (15.9)	9.7 (2.4)	Christian god	0.98 (0.13)	Ancestor spirits	0.31 (0.46)
Mean	148.5	65.1	37.0 (14.8)	7.1 (5.4)	—	0.87 (0.34)	—	0.55 (0.50)

2.2. Methods

Prior to collecting the data used in the present study, researchers at each field site conducted preliminary ethnographic interviews to design the primary survey tools. Field researchers used these preliminary interviews to obtain comparable data about various deities known by participants. Then, using a set of ratings for each deity that participants listed, researchers selected two on

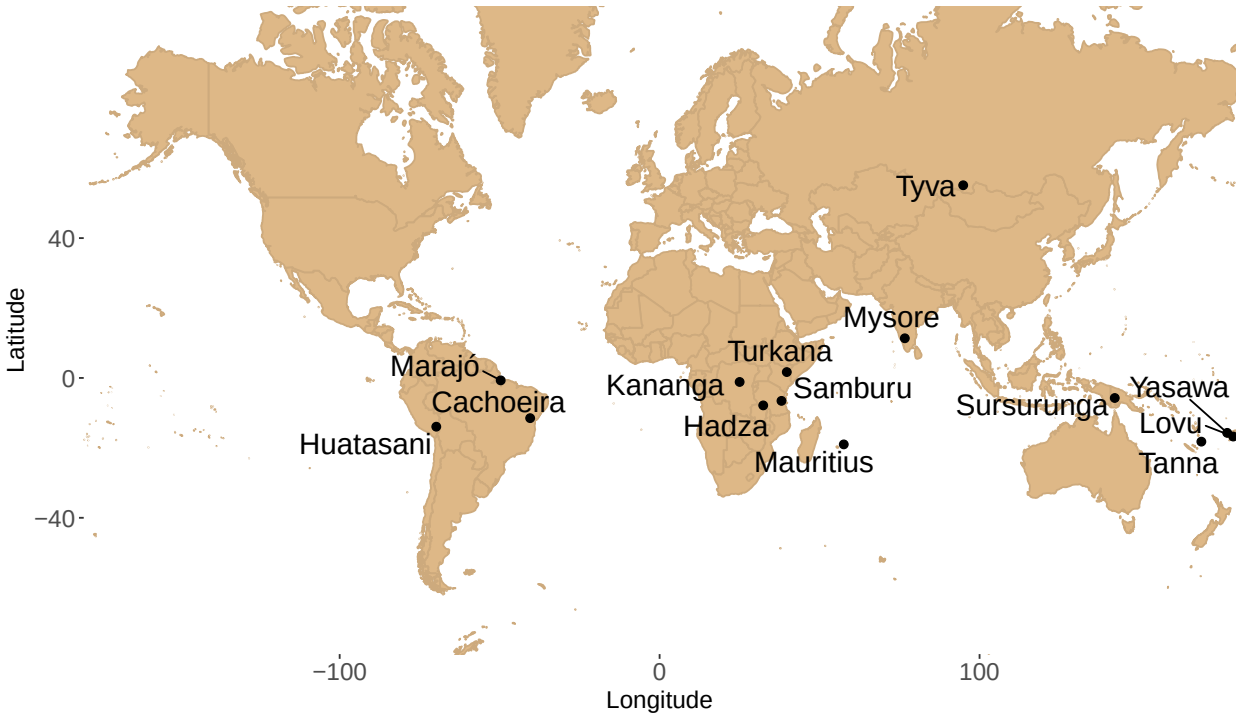

Figure 1: **Map of field sites.** The Tanna site includes two culturally distinct Tannese groups (coastal and inland).

the basis of their being: 1) the most moralistic, punitive, and knowledgeable (our "moralistic deities") and 2) relatively less moralistic, punitive, and knowledgeable, but locally salient (our "local deities"). Note that in two sites—the Huatasani and Kananga—researchers asked about two different local deities (see Table 1). We pool questions about these together in the main analyses and demonstrate in Supplementary Section S2.2 that the main results are robust to analyzing them separately.

In the primary survey, we asked participants a series of questions about each of the two deities. These questions had the general form of: *How important is punishing X to deity Y?* (where X is either liars, thieves, or murderers, and Y is either the moralistic or local deity). These were on a scale of 0 to 4 (0—not important at all; 1—a little important; 2—important; 3—very important; 4—the most important thing). The Hadza answered an alternative version of these questions, with "Yes", "No", and "I don't know" as possible outcomes (see Table 1). We operationalize gods' moral concern with these scales.

2.3. Statistical model

We fit all models using the `rstan` package (Stan Development Team, 2019) and R (R Core Team, 2016). We use ordered-logistic regressions to model outcomes for gods' moral concerns. In each population, j, we asked individuals, i, a set of three questions, q (concerning murder, theft, and lying), for each of two deities, d (moralistic and local). In each case, the outcome, $K_{[i,q,d]}$, is an ordered categorical response. As such, we model them using an ordered categorical likelihood

model with a linear model $\xi_{[i,q,d]}$ and a vector of random cut-points, C:

$$K_{[i,q,d]} \sim \text{Ordered Categorical}(\xi_{[i,q,d]}, C) \quad (1)$$

The linear model $\xi_{[i,q,d]}$ is then given by:

$$\xi_{[i,q,d]} = \beta_{[j(i),q,d,1]} + \beta_{[j(i),q,d,2]} A_{[i]} + \beta_{[j(i),q,d,3]} M_{[i]} + \beta_{[j(i),q,d,4]} E_{[i]} + \beta_{[j(i),q,d,5]} \Phi_{[j(i),K_{[i,q,1]}]} \delta_{[i,q,d]} \quad (2)$$

where: $j(i)$ gives the site of individual i, $A_{[i]}$ is the age of individual i (centered by site), $M_{[i]}$ is a variable indicating if individual i is male, and $E_{[i]}$ is the years of formal education completed by individual i (centered by site). In the last term, we see that $K_{[i,q,1]}$ is the response that individual i gave about his or her moralistic deity's concern in question q. The symbol $\Phi_{[s,]}$ denotes a site-specific, positive, ordered, parameter vector whose last element is equal to 1. We use these parameters to account for the fact that ordered categories cannot be directly interpreted as numerical values (see details in Supplementary Section S1). The coefficient $\beta_{[j(i),q,d,5]}$ measures if individuals in site j are more likely to give a positive response about a local deity's concern about moral behavior if they also believe that the moralistic deity is concerned about moral behavior—this term may indicate cross-deity influence, or "conceptual bleeding" between deities. In the last term, $\delta_{[i,q,d]}$, is a binary indicator for if the question was about the local deity—this ensures that the last term only enters the regression model for outcomes about the concerns of local deities. See Supplementary Section S1 for full model definition and diagnostics and Section S2 for further analyses.

2.4. Results

2.4.1. Cross-population beliefs and contexts

Figure 2 is a series of plots of the moral punishment index for the moralistic and local deities across sites (see Table 1). The curves illustrate the fraction of responses—across all three questions—in which respondents indicated that the focal deity cared *at least as much as* that indicated by the category value. As such, all curves are descending. For example, among the Sursurunga, a large majority of respondents indicated that the moralistic god cared moderately (category levels 1 and 2) about moral behaviors, but very few respondents indicated that such behaviors are the most important concern (category level 4) of this deity. In Yasawa, by contrast, almost all individuals indicated that such moral behaviors were the most important concern of the moralistic deity. Note that virtually all sites show that even the so-called "moralistic" deities lack high ratings; across sites, the median response for moralistic gods was category level 2 ("important").

While many sites have considerable overlap between both deities (e.g., Inland Tanna, Marajó, Mysore, and the Tyva Republic), there are a few with notable divergences between moral concern ratings (e.g., Sursurunga, Turkana, Kananga, and Yasawans). Of these diverging sites, all are Christian other than the Mauritians, whose "moralistic" deity is Shiva, and the "local" counterpart is *nam*, a ghost or spirit. The differences between the two deities vary considerably[2]. This variation is partially explained by factors associated with religious syncretism versus antagonism and/or how

[2]In order to make better sense of this, Purzycki consulted with field researchers about the relationship between the two deities/traditions they investigated. After producing the initial cross-site distribution plots but prior to contacting the data collectors, Purzycki read the brief ethnographic descriptions of the present sites in materials published elsewhere (see note 3). All of these particular sites' descriptions explicitly indicated some degree of malevolence associated with these deities. The further contextualization of the Mauritian *nam*, however, was offered after we conducted analyses.

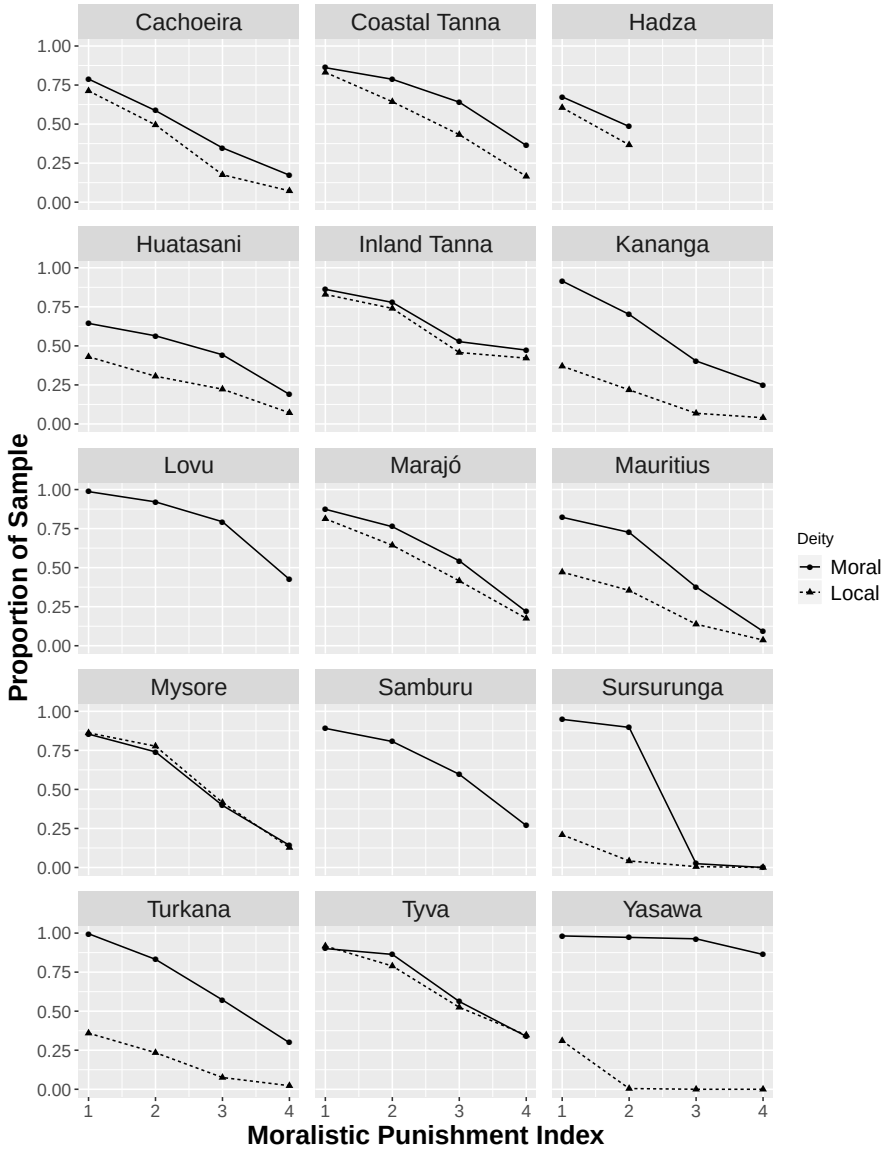

Figure 2: **Sensitivity analysis of the moralistic punishment index for "local" (dashed) and "moralistic" (solid) deities across sites.** The Likert-scale was set on a 0 to 4 range for all sites other than Hadza who answered different questions (e.g., *Does Haine/Ishoko punish people for stealing?*). Hadza responses were on a scale from 0 to 2 (no; I don't know; and yes). In all sites, the base value of 0 indicates that the deity is believed to not care at all about the behavior indicated in the survey question. The curves illustrate the fraction of responses—across all three questions—in which respondents indicated that the focal deity cared *at least as much as* that indicated by the category value. Since all participants who answered these questions answered with at least a zero value, we do not include these in the illustration.

malevolent local deities were thought to be. If, for instance, the tenets of—and believers in—Christianity were seen as hostile toward local deity commitments (e.g., if worship of local deities is thought of as idolatry, devil worship, or culturally backwards), there may be a disinclination to claim such deities are morally concerned. In other words, individuals in some contexts might be

suppressing their inclinations towards the patterns we see cross-culturally. If true, it would suggest that imperialistic traditions like Christianity might have contributed to replacing the moralistic role of local deities. Regardless, in some cases, traditional spirits might be thought to *enjoy* or even *cause* immoral behavior. It is difficult to determine this with our data, but the following discussion lends some support to these speculations.

Of all sites in Figure 2 with large between-deity divergences, Mauritians were the only non-Christian group. There, the local deity was *nam* (i.e., spirits) and the moralistic deity was Shiva. As they are linked both to ancestral worship and to the practice of black magic, beliefs in *nam* vary considerably. *Nam* elicit rituals for deceased family members and are represented as vengeful spirits (*jab*) who can be summoned by magicians to harm others. Black magic, however, is both taboo and illegal under Mauritian law (see **Eva Kundtová Klocová, et al., present volume**). Note that *nam* are syncretic supernatural entities that consist in an amalgam of Christian, African, and South Asian beliefs. It may be that the dark, demonic aspects of the *nam* are related to concepts borrowed from Christians. In some cases, then, Mauritians hold that spirits despise anything connected to gods or religion and are seen as quite antagonistic. The other stark contrasts may reflect a similar antagonism further clarified by an assessment of the local deities among the Christian samples. Among the Christian groups, the Kananga, Sursurunga, Turkana, and Yasawans also show relatively sharp contrasts between deities. In these sites, participants often view the local deities—all ancestor spirits—as malevolent or competing with Christian values.

Recall that the Kanangans answered questions for both *Kadima*—a deity that few actually claimed to believe in—and their ancestor spirits. To further examine this interpretation, we treated Kanangans as two different groups: those who answered questions about *Kadima* and those who answered questions about ancestor spirits. The intercept for *Kadima* is far lower than the average, and the Christian deity shows a larger difference between *Kadima* than from the ancestor spirits (see Supplementary Section S2.2 where we did the same for the Huatasani as well). The Christian Sursurunga also showed this stark contrast. However, they answered questions about *sirmát*, a spirit with practices shrouded in secrecy and private affairs, so it is difficult to determine this tradition's relationship with Christianity.

The Cachoeira and Marajó Brazilian Christians, on the other hand, do not exhibit such a contrast. The Cachoeira answered questions about *Ogum*—a syncretic cult figure often represented as St. George or St. Anthony—and God. Similarly, the Marajó Brazilians answered questions about God and St. Mary—the wife-mother of the Christian deity. In both cases, the local spirits are obviously a part of the moralistic deity tradition. In another case of syncretism, half of the sample of Huatasani answered questions about Christian saints and the other half answered questions about local spirits, *apus*, from the syncretically interwoven traditional Andean religious traditions (see supplements in Lang et al. 2019). The Christianity of the Coastal Tannese is also more harmonious with the local *Tepunus* tradition and there are not general taboos against participating in the local traditions. In contrast to the cases described above, these local spirit traditions effectively function harmoniously alongside those associated with the moralistic deity traditions.

Compare these results to the non-Christian samples, the Hindu Mysore residents, Buddhist Tyvans, and traditional Inland Tannese. The Mysore residents answered questions about two Hindu deities, the Inland Tannese answered questions about two traditional deities, and the Tyvans answered questions about the syncretically intertwined god of Buddhism (*Buddha-Burgan*) and local spirit-masters of the shamanic tradition. In all of these cases, the plots resemble those where Christianity functions in tandem with local traditions. We discuss this in more detail below.

2.4.2. Moralization bias of gods' minds

Table 2 provides the results of our predictive models. Model $M0$ is the null model that includes varying intercepts for item type and field site. Model $M1$ adds varying slopes for age, sex, and years of formal education. Model $M2$ adds a control for "conceptual bleeding," by including the response about the moralistic deity in the predictive model for the local deity. Model $M3$ includes both form of controls. Figure 3 visually represents the varying effects.

Table 2: **Model estimates (90% credibility intervals) for target variables and indices by site.** Local deity intercept estimates reflect the case where the moralistic deity score is at the median value of the scale (2).

Model	Intercept	Age	Male	Education	Bleeding
Moralistic Deity; M0	2.38 (2.12; 2.63)	—	—	—	—
Moralistic Deity; M1	2.41 (2.13; 2.67)	0.00 (-0.00; 0.01)	-0.03 (-0.11; 0.07)	-0.01 (-0.03; 0.01)	—
Moralistic Deity; M2	2.49 (2.21; 2.78)	—	—	—	—
Moralistic Deity; M3	2.52 (2.22; 2.79)	0.00 (-0.00; 0.01)	-0.03 (-0.11; 0.07)	-0.01 (-0.03; 0.01)	—
Local Deity; M0	0.54 (0.10; 1.11)	—	—	—	—
Local Deity; M1	0.59 (0.18; 1.02)	0.00 (-0.00; 0.01)	-0.14 (-0.30; 0.01)	-0.05 (-0.06; -0.03)	—
Local Deity; M2	0.35 (-0.09; 0.82)	—	—	—	2.98 (2.22; 3.75)
Local Deity; M3	0.43 (0.01; 0.83)	0.00 (-0.00; 0.01)	-0.14 (-0.27; -0.00)	-0.03 (-0.05; -0.02)	2.93 (2.28; 3.69)

Consistent with our predictions, across model specifications, the local deities' moralistic punishment index is positive. Even in the case of Model $M2$ where the lower bound of the interval dips below zero, the bulk its mass is above zero. As expected from our design, moralistic deities are consistently even more interested in moralistic punishment than local deities are. Moreover, there is an association between moralistic punishment scores of local and moralistic deities; the two deities' rated moral interests increase together.

Age showed a slightly positive but negligible relationship with the extent of moral concern attributed to the moralistic and local deities. Years of formal education showed little in the way of accounting for the moralization of the moralistic deities, but predicted a slight, but consistently negative association with moralization of local deities, also as predicted. In other words, the more educated one is, the less likely this person will ascribe moral interests to local deities. Sex had the strongest association with the moralization of gods' interests; women are more likely to moralize across deities, though the effect of sex is stronger for local deities.

As illustrated in Figure 3, across most sites, the data suggest that respondents are more likely than not to attribute at least some moral concern to local deities. The extent to which respondents attribute moral concern to local deities typically covaries with the extent to which they attribute moral concern to the moralistic deity. This pattern is apparent in the plots where the probability of indicating moral concern for the local deity increases as a function of the level of moral concern for the same question attributed to the moralistic deity. Even in the most obvious case to the contrary, Yasawans still show this trend for ancestor spirits' concerns about punishing murder (though intervals indicate that answers hover around a 50% chance of answering positively for the local deity when the moralistic deity was assigned a category value < 4). In another contrary case, the Sursurunga have a roughly constant probability of indicating that the local deity was concerned with morality, irrespective of the value ascribed to the moralistic deity.

The model predicts Cachoeirans to have a similar distribution of responses, though the trends are positive with a slightly larger positive estimate for *Ogum's* concern for murder. Curiously, in the Tyva Republic and Mysore, local deities appear to have a *greater* likelihood of moral concern than the moralistic deity does. Unlike the case in Mysore, where Chamundeshwari is more often explicitly associated with moralistic punishment (**Placek and Lightner, present volume**), Tyvans are not

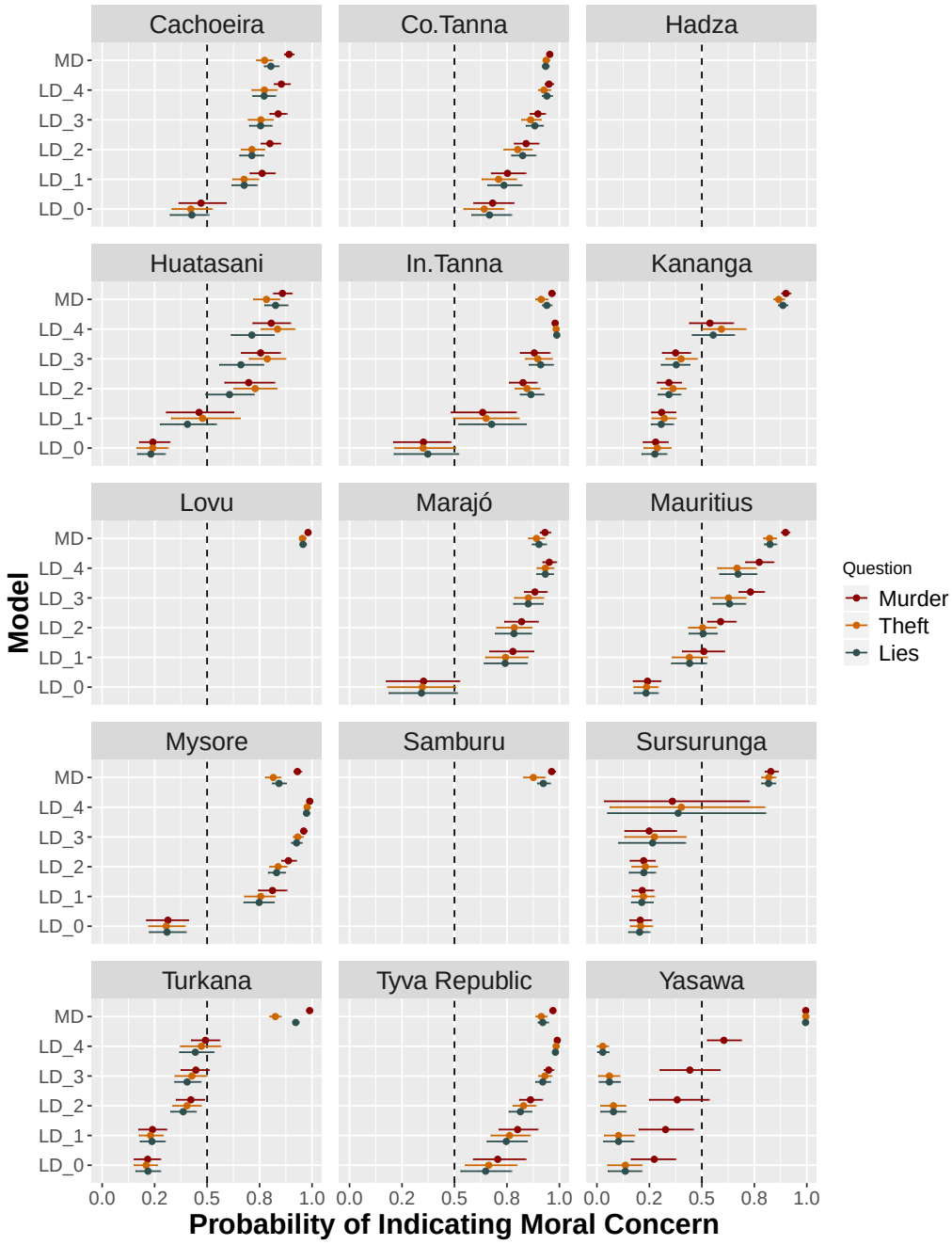

Figure 3: **Probability plot of positive answers to moral questions about the local (LD) and moralistic (MD) deities across sites.** Intervals are 90% credibility intervals. The rows labeled MD reflect the probability of a non-zero response for the moralistic deities. The rows labeled LD reflect the probability of a non-zero response for the local deities, when respondents indicated that the moralistic deity had the indicated level of moral concern on the Likert-scale. Hadza data are not included due to scale differences, and Lovu and Samburu lack LD data (see Section 2.4.3). Note that Yasawans' views of the Christian god's moral concerns are at ceiling, hence the minute intervals for MD. Values are from Model $M3$ in Table 2.

likely to free-list moral behaviors among the things for which these spirits care (Purzycki, 2016). They do, however, explicitly associate moral concern with *Buddha Burgan*, the selected moralistic deity (Purzycki and Holland, 2018).

2.4.3. The curious case of the Hadza?

Of particular importance here are the foraging Hadza of Tanzania. Historically, field researchers have characterized the Hadza as being "minimally religious" due to their relative lack of religious authorities, spaces, meetings, belief in omniscient and moralizing gods and an afterlife (see Apicella, 2018; Marlowe, 2010; Smith et al., 2018; Woodburn, 1982). Recently, this characterization has been contested on the grounds that these aspects of religious life represent only a subset of important religious phenomena present among the Hadza (Power, 2015, 2016; Skaanes, 2015, 2016, 2017). Collectively, these sources point to the undeniable fact that Hadza life is replete with important ritual behavior and cosmological beliefs.

One of the most important and discussed rituals among the Hadza center around *epeme* meat-eating and the *epeme* dance. *Epeme* rituals regulate meat distribution and violations of these rituals are thought to result in illness or death (Marlowe, 2010), perhaps via spiritual repercussions (Power, 2016; Skaanes, 2015, 2016, 2017). Relatedly, the *epeme* dance that occurs on moonless nights is thought to bring unity, good fortune, and healing (Apicella, 2018; Marlowe, 2010; Woodburn, 1964). Indeed, co-participation in *epeme* rituals has been shown to increase cooperative bonds between individuals (Hill et al., 2014).

In the present sample, the Hadza answered the moralistic punishment index questions using a different scale, they were not included in the main analysis, so direct comparison is difficult. In Figure 2, the Hadza show $\sim 50\%$ chance of answering affirmatively to the moralistic punishment questions, a non-trivial frequency of such beliefs. To put this value into perspective, on the 4-point scale, roughly the same proportions are found among Christian: a) Brazilians at level 3 (Marajó) and 2 (Cachoeira); Turkana at level 3; and Samburu at level 3. In other words, the Hadza are not answering these questions much differently from many Christians about their deity.

To inquire further, we conducted an analysis of freely-listed data. In this task, C.A. asked a subset of participants—who expressed belief in Haine and Ishoko—to list things that pleased and angered them, the "moralistic" and "local" deities selected for the Hadza (though note that these deities are often conflated and vaguely defined). Using this data, we can get a single index of ubiquity and cognitive salience (i.e., item placement in lists; Smith et al. 1995). Data items were coded using a twelve-category coding system by two coders (see Supplementary Section S3.1). Purzycki resolved any disagreements by selecting what he considered the more appropriate category of the two. Free-list data were then analyzed using the AnthroTools package (Jamieson-Lane and Purzycki, 2016; Purzycki and Jamieson-Lane, 2016) for R.

According to these analyses, both Haine and Ishoko are explicitly associated with concern for morality and social harmony. Figure 4 illustrates the cultural models of *Haine's* concerns. The most salient items listed for things that anger Haine were immoral acts (30/57; 53% of the sample), while the most salient items listed that please *Haine* were indices of social harmony (coded as "People"; 22/58; 38%). There were many individuals who said they did not know (denoted by "D/K"), but both deities were predominantly associated with morality and social harmony. Note again, however, that those sampled were individuals who expressed belief in these entities. If it were the case that these explicit beliefs were borrowed from Christianity, the analyses above nevertheless predict intuitive moral concern for any deity without exogenous factors that would interfere with this general propensity. While the relationship not robust to various tests,

Stagnaro, et al. (present volume) suggest that *Haine's* status as a punitive deity may increase with exposure to Christian missionaries whose traditions the Hadza nevertheless reject. Moreover, in their exploratory analyses, there was no clear relationship between moralizing *Haine* and offers in a Dictator Game, but answering other qualitative questions about the afterlife in a manner that resonates with Christian doctrine appear to have increased *parochial* favoritism.

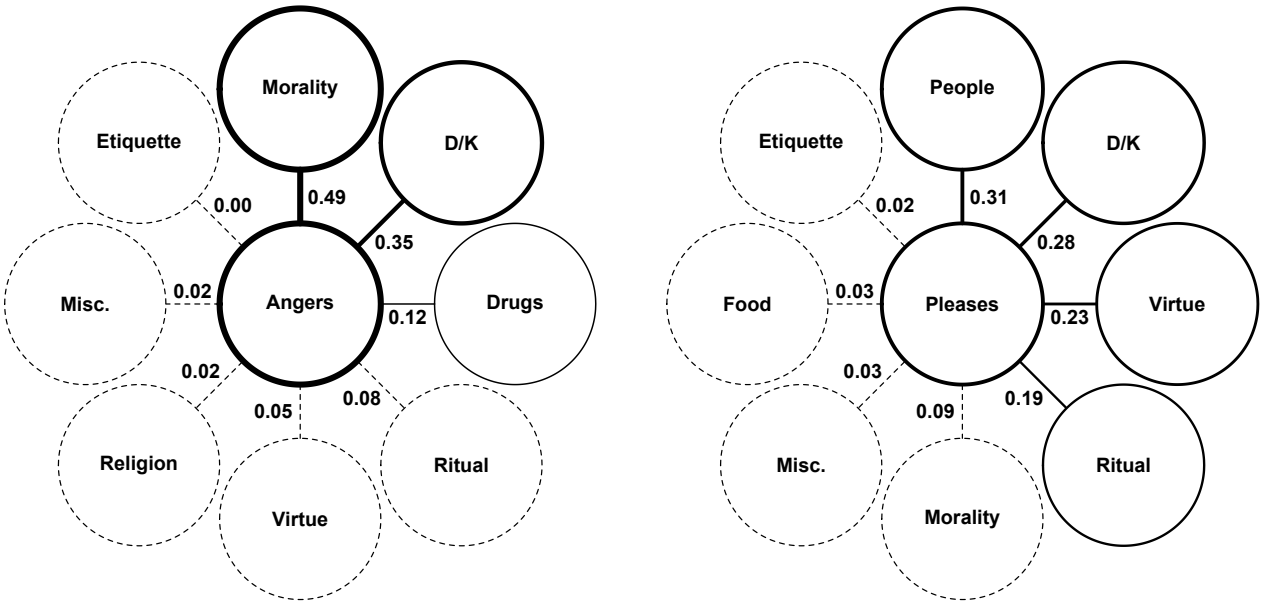

Figure 4: **Cultural models of what angers (left; $N = 57$) and pleases (right; $N = 58$) *Haine*.** Values reflect salience of item, a value that increases as a function of ubiquity in sample and placement on individual lists. Note that these data were collected only among those who expressed belief in *Haine*. Dotted lines indicate item types with salience < 0.10. "D/K" refers to "I don't know". Note that *Ishoko* data were similar (see Supplementary Section S3.2).

To examine the proposed role of missionaries, we used responses to the question: "*Has a missionary ever tried to teach you about Mungu?*" (*Mungu* is the Swahili word for the Abrahamic god) to predict the presence of moral content in Hadza beliefs about *Haine* and *Ishoko's* concerns. As not everyone who answered free-lists answered the question about missionaries, the sample for this is reduced ($n = 40$), thus splitting the sample into those who answered affirmatively for having been contacted by missionaries ($n = 20$) and those who did not (19 said "no" and one said he or she didn't know). Out of these 40 individuals, 18 listed morality in what angers *Haine*, three listed moral items for what pleases *Haine*, 12 listed moral violations for what angers *Ishoko* when only a single individual listed a moral item for what pleases *Ishoko*. Because of sparseness of data in some sub-domains, we did not aggregate these questions into a single model and parameterize deity types and free-list task. Instead, we analyzed each free-list domain separately. Recall, too, that only participants who claimed to believe in *Haine* and *Ishoko* participated in the free-list task. With these caveats in mind, we found no reliable association between missionary contact and claiming *Ishoko* and *Haine* care about morality (Fig. 5; see supplementary section S3.3 for further details). The largest estimated missionary influence was on what angers *Haine*, but it is an unreliable relationship as a considerable amount of the interval dips below the threshold of no effect (1 on a logarithmic scale in Figure 5). Ignoring the intervals, its corollary model predicts that

a female who did not answer affirmatively to having contact with a missionary has a 36% chance of claiming immoral behavior angers *Haine* and contact increases the chances only by 8%.

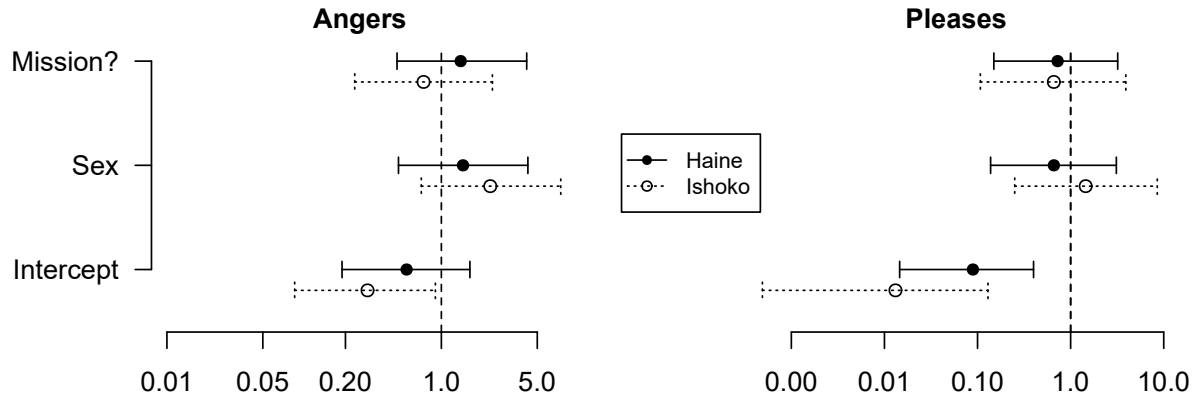

Figure 5: **Exponentiated estimates (odds ratios) of likelihood of listing an item coded as "morality" in free-list tasks about what angers (left) and pleases (right) two Hadza deities (n = 40)**. Dotted line marks threshold of no effect. X-axis is on logarithmic scale. See supplementary section S3.3 for model structure and estimates.

There appears to be no clear relationship between missionary exposure and moral content in beliefs about these gods' concerns. These results may reflect a lack of an effect of *present* missionary exposure on *present* beliefs among those who expressed belief in Haine/Ishoko. It could be that some previous influences and subsequent transmission have maintained moralistic *Ishoko* and *Haine* concepts, but it could also be that participants have associated moral concerns with these deities for quite some time and have done so with little influence of external sources. Given that small populations are rapidly changing, the relationship between moralistic beliefs and social complexity remains–as ever–a vexing question to resolve.

3. Discussion

Beliefs in moralistic supernatural punishment are cross-culturally widespread; across 15 field sites, multiple deities, and three questions concerning moral behavior, we find that participants expressed an overall belief that deities are, in fact, concerned with the moral behavior of human beings. Importantly, even local deities specifically selected to be *less* morally concerned, punitive, and knowledgeable than the explicitly moralistic deities of the world religions, still show evidence of a "moralization bias"; people are more likely to claim local deities care about morality than not. This effect is generally robust to inclusion of a control for "conceptual bleeding" as well as controls for the effects of sex, education, and age. This finding has important implications for current debates and theory.

For over half a century, the reigning consensus in the field has been that belief in moralistic high gods developed as a consequence of increased social complexity and a more highly stratified resource distribution (Peoples and Marlowe, 2012; Swanson, 1964) and more recent analyses suggest that broader supernatural punishment is ubiquitous throughout history and social complexity (Watts et al., 2015a). Here, we show that when directly asked about local deities—specifically selected

because of their relative *lack* of moral concern—individuals nevertheless provide positive answers with a general increasing probability of answering in similar ways to the moralistic deities. In other words, local deities exhibit defining properties associated with "moralistic gods".

Our analysis of the Hadza data further complicates this relationship between social complexity and gods' moral concerns. Some have characterized the San, for example, as not needing a moralistic god because they resolve social problems on their own (Marshall, 1962) leading numerous sources to hold them up as a prototypical example of having a "non-moralistic" religious tradition (e.g., Norenzayan et al., 2016; Peoples and Marlowe, 2012; Wright, 2010). However, like the broader ethnographic record, this provides only an anecdote and there are notable inconsistencies across sources. Indeed, much of this literature draws opposite conclusions about San religion. According to Lee (2003), the San view the *//gangwasi* ancestor spirits as the major cause of illness. They are motivated by either reducing or exacerbating human conflict (pp. 129-130) and, according to one individual "the *//gangwasi* don't like people who fight" (130). These morally ambiguous gods play important roles in unambiguously moral tales (Guenther, 1999) and "arouse numinous feelings" and "apprehension." San conduct rituals designed to alleviate spirits' wrath in an "emotional climate of 'dense moral interaction'," and provide a forum for where local grievances are addressed (Guenther, 1979). Directly and systematically asking people using precise methods–and clear and consistent definitions (see McKay and Whitehouse, 2014)–is likely to give us a different portrait of traditional beliefs than extant, societal-level, high-inference, and qualitative accounts (or databases utilizing such accounts) would suggest. Indeed, we found that a high proportion of Hadza claim that both gods care about morality and the free-lists were clearly associated with moral content and social harmony as well among believers, and chalking it up to missionary influence is difficult to justify without clearer evidence.

Our results indicate one contributing mechanism for religion's role in human cooperation: *inferring that spiritual agents are concerned with moralistic punishment may decrease secular costs associated with engaging in immoral behavior and may stabilize cooperative social relationships.* However, others posit that such an association is merely epiphenomenal and that people care about the gods that they care about *because* they are assumed to be morally engaged or that they serve as models upon which to base behavior (Boyer, 2000, 2008). In other words, a moralization bias of gods' minds might not obviously mediate behavior. Setting aside the abundant evidence that suggests the contrary (see Introduction), this position does raise implications for the relative importance of what kind of relationship morality has with religious beliefs both cognitively and behaviorally.

If we take the present survey data as representative of *explicit* beliefs—as is often standard in social scientific methods—this strengthens the case for the ubiquity of "moralistic" deities; previous generations of scholars and researchers have probably underestimated their ubiquity (and perhaps overestimated how important they have been in cooperation), particularly as so few have directly asked people. If, however, we interpret the results as indicative of an implicit bias, the question of whether or not explicitly moralistic gods are any better at inducing cooperation at greater scales than deities concerned with other things remains unresolved. Cultural evolutionary approaches to religious beliefs tend to emphasize explicit cultural transmission that harnesses or triggers psychological systems that may motivate behavior, but the importance of beliefs' *explicitness* is not formally modeled. We also know very little about the causal pathways between inferences, explicit

representations, cultural prevalence, and action (Purzycki et al., 2018b)[3].

In fact, no study to date has found a firm relationship between cooperation—however broad—and gods' explicit association with morality (see Stagnaro et al., 2019). While some (Lang et al., 2019; Purzycki et al., 2016) find that local deities' punishment, knowledge breadth, and moral concern does not strongly predict differential allocations in experimental economic games, the target recipients of allocations were predominantly identified as constituents of the local moralistic religious tradition (cf. Apicella, 2018, **and Soler, et al., present volume**) and *not* local deities[4]. Moreover, moral concern using these scales played no detectable role in allocations across deities; the moralistic punishment index showed no relationship with fairness (Purzycki et al., 2018a). When it has, it has been inconsistent across contexts (see Lang et al., 2019). To the best of our knowledge, only one study has compared—albeit indirectly—the effects of moralistic and local deities on fairness and cooperation with experimental manipulations (McNamara and Henrich 2018, though see Hadnes and Schumacher 2012). In that study, Yasawan Fijians experimentally primed with traditional imagery increase parochial biases in money allocations when they say these spirits punish people, despite the fact that Yasawans rate these deities at floor values of moralistic punishment. Future studies considering both pathways should be informed by the conflict/harmony between deities, the greater cultural context, and modeled appropriately.

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Author Contributions

B.G.P. managed this project and wrote the bulk of the manuscript and the supplements, and co-managed the overarching project with J.H., M.L., and A.N. B.G.P. and C.T.R. developed the models, C.T.R. wrote `stan` code for the main analyses, and produced all illustrations in the main text, and B.G.P. wrote the bulk of the R code for the supplementary analyses. E.K.K., B.G.P., C.T.R., and A.W. contributed to data processing, analysis auditing, editing, and writing, and contributed to the supplementary analyses. All other authors contributed data and informal input regarding the ethnographic context of their field sites.

Supplementary Materials

Supplementary materials including data, R scripts, and methods protocols to this article can be found online at `https://github.com/bgpurzycki/xxx`.

[3]Some (Purzycki et al., 2018a; Rossano and LeBlanc, 2017) have speculated that explicit religious beliefs may reduce variation in corollary behaviors and coordination costs, but this remains to be seen.

[4]Neither deities' qualities nor their relationships were varied across sites. Indeed, in those reports, Yasawans and Mauritians were included, two sites where devotion to local spirits is taboo or illegal.

Ethical Statement

This project was originally approved by the University of British Columbia's Behavioural Research Ethics Board (#H13-00671) and subsequently approved by the ethical review boards at the home university of each researcher who collected the data.

Declaration of Conflicting Interests

The authors declare that they have no conflicts of interest with respect to the authorship or publication of this article.

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Open Practices

We used the publicly available Evolution of Religion and Morality Project data set Version 6.0. All data and analytical scripts for use in R are available at http://github.com/bgpurzycki/xxx.

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