

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

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## Abstract

There are compelling reasons to expect that cognitively representing any active, powerful deity motivates cooperative behavior. One mechanism underlying this association could be a cognitive bias toward generally attributing moral concern to anthropomorphic agents. If humans cognitively represent the minds of deities and humans in the same way, and if human 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 2,228 individuals in 15 different field sites, we test for the existence of such a bias. We find that people are indeed more likely than chance to indicate that local deities are concerned with punishing theft, murder, and deceit. This effect is stable even after holding constant the effects of beliefs about explicitly moralistic deities. Additionally, we take a close look at data collected among Hadza foragers and find two of their deities to be morally interested. There is no evidence to suggest that this effect is due to direct missionary contact. 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 cooperation.

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

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## 1. Introduction

### 1.1. Background

Considerable cross-cultural research focuses on the emergence, persistence, and ubiquity of belief in “moralistic” or “morally concerned” gods (Baumard et al., 2015; Beheim et al., 2019; 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 between gods and moral interest is relatively ubiquitous, and many posit that this deep relationship can account for why gods are frequently 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 humans generally infer that other agents/minds are moralistic, and if supernatural deities are conceptualized as agents/minds, then it would imply that belief in moralistic deities could be more widespread than previous work suggests.

How likely is it that people attribute moral concern to their deities? How ubiquitous is this association? What are 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, using data on 28 deities from 15 ethnographically distinct societies. We conclude by discussing the implications that our study poses for current social scientific research on religion.

### 1.2. Moralistic supernatural punishment and the evolution of sociality

An ongoing—and old—debate regards the relationship between morality, deities, 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 in complex societies, normative belief in a moralistic deity 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 deities, but disagreements persist over the ubiquity, nature, and scope of moralistic supernatural punishment<sup>1</sup>. However, some non-trivial

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<sup>1</sup>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-

problems lurk beneath the purported 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 large samples of individuals if their deities care about human morality using explicitly defined and transparent methods for this purpose (cf. [Lang et al., 2019](#); [Purzycki, 2011](#); [Singh et al., 2021](#)). Indeed, virtually all cross-cultural studies that have focused on—and found—a relationship between social complexity and moralistic deities rely on site-level 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 site-level variables have historically focused on the presence of “high gods”—defined as *creator* deities—that are “specifically supportive of human morality.” The status of deities as creators is often not theoretically relevant to many research questions, so relying on such a coding of deities can lead to the problematic exclusion of moralistic deities that are *not* creator deities. Moreover, the coding schemes used in these sources frequently confound the categories of “high gods absent” and “high gods not reported in the selected resources”. In other words, textual sources that do not comment on moralistic high gods are treated as providing the same quality of data as textual sources that make definite claims of absence. Moreover, a detailed reading of ethnographic sources suggests that supernatural sanctions revolve around interpersonal social norms that could be construed as “moral” (cf. [Boehm, 2008](#); [Swanson, 1964](#)), even in societies that are characterized as not believing in any moralistic deities. A final data quality concern is that most extant cross-cultural data sources characterize entire groups as having or not having a particular belief, despite the fact that such beliefs are individual-level traits that often vary *within* groups.

A second set of issues stems from prior work not being able to adequately account for the association between moral cognition and the perceptual systems responsible for detecting minds. Even when considering variation across the sexes and the autism spectrum, the ability of humans 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](#)). Human children and adults 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 suggest—and partly demonstrate—that moral psychology is deeply intertwined with the perception of other minds as agents ([Gray and Wegner, 2011](#); [Gray et al., 2012](#)). As empathy facilitates making decisions that others might deem “good” and avoiding decisions that others might 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

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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. As such, “moralistic gods” here are gods that care about morality, leaving the “moral to whom?” question open.

have taken this further to suggest that morality is didactic in nature; that is, we often interpret misfortune as a moral punishment, and 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 individuals perceive others—especially those who are part of their social group—as minds or agents, then they should infer that those agents care about our moral behavior and can potentially punish us when we violate moral norms. Despite cultural variation in the explicit concerns attributed to various deities, this “moralization” effect appears to extend to the minds of deities 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 Pitzten, 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 deities in a variety of contexts, but the concerns that they appear to attribute to these deities are neither arbitrary nor mere projections of their personal interests. Some have suggested that supernatural deities are often 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; Bendixen and Purzycki, 2020). In addition to morality, people appear to restrict 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 the minds of supernatural deities triggers moral cognition, regardless of the culturally postulated concerns of such deities (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 deities or ghosts as primes, people appear to break fewer rules on average when entertaining the presence of such agents.

Drawing on these findings, other studies point to the intuitiveness of associating cognitive moral domains and the minds of deities or deity-like beings. For example, Purzycki et al. (2012) has 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). In free-list tasks, Tyvans from southern Siberia explicitly claim that local spirits are predominantly concerned with ritual and environmental maintenance (Purzycki, 2011, 2016). However, when asked specifically targeted questions about these 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 explicitly associated with narrow and culturally dependent domains of concern, people nevertheless tend to infer that spirits know and care about the (im)moral behaviors of people (relative to morally irrelevant information), even when such behaviors fall outside the scope of their explicit domains of governance. Here, we pursue this line of interrogation across various cultural contexts.

#### 1.4. Predictions

If reasoning about human-like minds triggers moral cognition, and if we perceive supernatural deities as minds, then 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 deity 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 deities that are viewed less as enforcers of morality (referred to here as “local deities”) than their relatively more moralistic counterparts (i.e., “moralistic” deities). This effect should be evident even when holding constant—as much as one can—any influence of belief in explicitly moralistic deities. For example, concurrent belief in Christianity might influence responses about local ancestor spirits due to Christianity’s: 1) imperialistic history, 2) varied reception among native populations, 3) often antagonistic relationship with local traditions and deities, and 4) alleged relative focus on morality (i.e., it is a prototypical “moralistic tradition”). Any indication of a reliably positive attribution of moral concerns to local deities (holding any such “conceptual bleeding” constant) would therefore offer a strong assessment of our predictions.

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, to the extent that age corresponds to more exposure to explicit

discourse about religious traditions, we would expect a negative effect of age on the likelihood that respondents report that local deities care about morality—note that this expectation presumes that, as one ages, one is more likely to represent each deity’s concerns in terms of explicitly stated, culturally prototypical beliefs, and thus perceive a starker contrast between the concerns of local and moralistic deities (see, for example, [Shaver and Sosis, 2014](#)). Similarly, years of formal education may move respondents toward answering in the culturally prototypical manner; e.g., more educated individuals may be less likely to associate moral concern to local deities because of their general inclination towards ideational expertise ([Purzycki, 2016](#)).

## 2. Study

This study is 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 [https://github.com/bgpurzycki/gods\\_moralization\\_bias](https://github.com/bgpurzycki/gods_moralization_bias). We collected all of the data analyzed here during post-experimental demographic and religiosity interviews.

### 2.1. Participants

Our working data set consists of responses from 2,228 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 used in 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 in the study required about 90 minutes of attention 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/Akuj	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)



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

## 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 set of instruments that we employed. Field researchers used these preliminary interviews to obtain comparable data about the various deities known by participants. Then, using a set of ratings for each deity that participants listed, researchers selected two on the basis of their being: 1) the most moralistic, punitive, and knowledgeable (our “moralistic deities”), and 2) relatively less moralistic, punitive, or knowledgeable, but locally salient (our “local deities”). Note that in two sites—the Huatasani and the Kananga—researchers asked about two different local deities (see Table 1). We pool questions about these deities together in the main analyses and demonstrate in Supplementary Section S3.2 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 and Section 2.4.3). We operationalize the moral concern of each deity using these scales.

### 2.3. Statistical modeling

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 the level of each deity’s moral concern in each site. More specifically, in each population,  $j$ , we asked each individual,  $i$ , 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 Stan’s ordered categorical likelihood distribution, which is parameterized using a linear model term,  $\xi_{[i,q,d]}$ , 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  $\Phi_{[j,1:5]}$  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 S2). The coefficient  $\beta_{[j,q,d,5]}$  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 zero-one 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 S2 for full model definition and diagnostics, and Section S3 for further analyses.

### 2.4. Results

#### 2.4.1. Cross-population beliefs and contexts

Figure 2 provides a series of plots of the moral punishment index for the moralistic and local deities across sites (see also Table 1; Supplementary Section S1 provides additional barplots of raw cross-site response frequencies). 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 along the x-axis. 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. We highlight two key findings: 1) across sites, local deities generally show at least some moral concern, sometimes even paralleling that of the moralistic deities, and 2) across most sites, even the so-called “moralistic” deities lack exceedingly high ratings; the median response for moralistic gods was category level 2 (“important”) and there is large cross-site variance in the y-axis values of higher-level Likert ratings. Jointly, these results suggest both that local deities may be conceptualized as being more concerned with human moral behavior than



previously realized, and also that even classic “moralistic” high-gods, like the Christian god, are often not conceptualized as being obsessively focused on human moral behavior. In both cases, deities do not seem to be represented cognitively as something radically other, but rather as typical human-like agents with a wide array of concerns—moral behavior being one such concern.

Across sites, the moral concern ratings of the moralistic and local deities vary in significant ways. While there is considerable overlap between the moral concern ratings of both deities in many sites (e.g., in Inland Tanna, Marajó, Mysore, and the Tyva Republic), there are sizable divergences in a few sites (e.g., in Sursurunga, Turkana, Kananga, and Yasawa). Of these diverging sites, all are Christian other than the Mauritians, where the “moralistic” deity is Shiva and the “local” counterpart is *nam*, a ghost or spirit. This cross-site variation is partially accounted for by factors associated with religious syncretism versus antagonism and/or how malevolent local deities are thought to be<sup>2</sup>. 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. The reverse causal direction is also plausible; in some cases, traditional spirits might be thought to *enjoy* or even *cause* immoral behavior, and societies might therefore restrict their worship<sup>3</sup>. It is difficult to determine a causal direction with our data, but the following discussion lends some support to at least one of the speculations sketched above.

Again, out of all of the sites with large between-deity divergences illustrated in Figure 2, Mauritians are 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 [Kundtová Klocová, et al., present volume](#)). Note that *nam* are syncretic supernatural entities that are 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 at least sometimes malevolent or competing with Christian values<sup>4</sup>.

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<sup>2</sup>In order to make better sense of this variation, 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 the local deities or some competition with moralistic tradition. The further contextualization of the Mauritian *nam*, however, was offered after we conducted analyses.

<sup>3</sup>It might also be the case that, at least in some groups, Christianity incidentally contributes to increased belief in local spirits—even “evil” ones—due to their ostensible Biblical reference.

<sup>4</sup>Note that the moralistic deity “Akuj” is the Turkana’s traditional creator deity that is now often treated synonymously with the Christian god. There is evidence that suggests that the traditional version of Akuj is also moralistic

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 from *Kadima* than from the ancestor spirits (see Supplementary Section S3.2 where we conduct the same analysis for the Huatasani as well). The Christian Sursurunga also showed this 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 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. A moralization bias of the minds of deities

Table 2 provides the results of our predictive models. Model *M0* is the null model that includes varying intercepts for the interaction of item type and field site. Model *M1* adds varying slopes for the effects of 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 forms of controls.

Age shows a negligible relationship with the extent of moral concern attributed to the moralistic and local deities. Sex has the strongest association with the moral concern attributed to deities; women are more likely to view deities as morally concerned, though the effect of sex is stronger for local deities and generally quite weak. Formal education also accounts for little of the moral concern attributed moralistic deities, but predicts a slight, but consistently negative, association with the moral concern attributed to local deities, as predicted. In other words, the more educated one is, the less likely this person is to ascribe moral interests to local deities.

Consistent with our predictions, we find that respondents, on average, are more likely than not to claim that their local deities have at least some moral concern (see the “intercept” terms in Table 2); this result is quite stable across models. In the base model, *M0*, which averages over

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and punitive (Barrett, 1989, pp. 5, 77-78, 87-89, 105-106).

Table 2: **Model estimates (90% credibility intervals) for target variables and indices by site.** In an effort to make the estimates of our ordered-categorical model more intuitive and understandable, we have re-parameterized the “intercept” terms slightly, giving them a somewhat non-standard interpretation. Accordingly, we have flagged the label with an asterisk so that readers are aware that these values should be interpreted as described below. First, we note that our continuous predictor variables have been centered by site. Second, the “intercept” terms have been adjusted so that they reflect the contributions of both the standard intercept parameter (i.e., the first  $\beta$  parameter in Eq. 2) and the first cut-point,  $C_1$ . Finally, the local deity “intercept” estimates that account for “conceptual bleeding” have been adjusted so that they reflect the case where the moralistic deity score is held at the median value of the scale (i.e., a Likert-level of 2 on a 0 to 4 scale). Jointly, these three conditions afford the following qualitative interpretation of the “intercept” terms: the “intercept” parameters for the moralistic deity model represent the predicted log odds of a female of average age and education claiming that her deities care (at least a little bit; a Likert-level of 1 or greater on a 0 to 4 scale) about moral behavior. For the local deity models, the “intercept” parameters represent the same quantity, but for a female of average age and education, who claims that her moralistic deity cares about moral issues at a Likert-level of 2. In general, we find that both moralistic and local deities are reliably characterized as having at least some level of moral concern. For more details see Supplementary Section S2.

Model	Intercept*	Age	Male	Education	Bleeding
Moralistic Deity; M0	2.38 (2.12; 2.63)	—	—	—	—
Moralistic Deity; M1	2.41 (2.13; 2.67)	0.002 (-0.003; 0.005)	-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)	0.002 (-0.003; 0.006)	-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)	0.002 (-0.001; 0.006)	-0.14 (-0.30; 0.01)	-0.05 (-0.06; -0.03)	—
Local Deity; M2	0.36 (-0.06; 0.83)	—	—	—	2.98 (2.22; 3.75)
Local Deity; M3	0.43 (0.01; 0.83)	0.003 (-0.001; 0.007)	-0.14 (-0.27; -0.00)	-0.03 (-0.05; -0.02)	2.93 (2.28; 3.69)

respondent characteristics, we observe a 63% (CI: 52%–75%) chance of attributing moral concern to local deities<sup>5</sup>. Even in the case of model  $M2$ , where the lower bound of the credible interval crosses zero, the majority of its density is well above zero. Note that model  $M2$  indicates that even among respondents who did not believe in an intensely morally-concerned moralistic deity (i.e., those whose moralistic deity had a Likert-level of 2 on a 0 to 4 scale), there is still a 59% (CI: 49%–70%) chance of attributing moral concern to local deities. In Supplementary Table S1, we also consider these estimates for an individual whose moralistic deity had a Likert-level of 4 on a 0 to 4 scale, and find that the intercept increases substantially to 1.49 (0.79; 2.18), which implies a probability of 82% (CI: 69%–90%) of indicating that local deities have some moral concern. As expected from our design, moralistic deities are generally more interested in moralistic punishment than are local deities, but the extent of this divergence is notably variable across sites (see Figure 3). Moreover, there is an individual-level association between the moralistic punishment scores of local and moralistic deities; the two deities’ moral interests increase together on average.

Figure 3 shows site-level estimates of the probability that respondents attribute at least some moral concern to moralistic and local deities. To interpret the figure, first note that the rows marked “MD” provide the estimated probabilities that individuals report that moralistic deities care at least somewhat about the indicated behavior; these estimates all tend to hover between 80% and 100%. For example, participants in a site like Sursurunga might systematically claim that it is only “important” (i.e.,  $MG = 2$ ) for their moralistic deity to punish people for a specific behavior—rather than “very important” or “the most important thing” (i.e.,  $MG = 3$  or 4)—and, nevertheless, the estimate labeled  $MG$  will still be high (see also Supplementary Figure S2).

<sup>5</sup>The equation  $\frac{\exp(x)}{1+\exp(x)}$  converts log-odds into probabilities.

The rows marked “LD” provide the estimated probabilities that individuals report that local deities care at least somewhat about the indicated behavior. Note, that the LD estimates are labeled with additional text of the form “(MD =  $x$ )”. We use this text to indicate the inferred LD values among the subset of the population who answered the *moralistic deity* questions at the Likert-scale level of  $x$ . As an example, the model predicts that, among Cachoeirans who say punishing moral transgressions is not important for the Christian god (i.e., MD = 0), the probability that the local deity will be reported as having at least some interest in punishing the same moral transgressions is around 50%. However, among Cachoeirans who say that the Christian deity finds it “a little important” (MD = 1) to punish the indicated immoral behaviors, the probability that the local deity will be reported as interested in punishing the same moral transgressions jumps to around 70%

In Figure 3, we mark the 50<sup>th</sup> and 80<sup>th</sup> percentiles as indicative of possible null models relative to which a moralization bias can be inferred. If participants answered randomly between local gods having *any* moral interests (regardless of level) and none at all, probabilities greater 0.5 would indicate a moralization bias. Simply put, a systematic inclination towards non-zero responses indicates that individuals are more likely than not to conceptualize local deities as having moral concern. With the exception of the Kananga, Sursurunga, Turkana, and Yasawan samples, local deity estimates generally meet this threshold, at least among the subsets of the population with MD = 2 or greater.

However, given the Likert-scale framing of our central research questions, a sample of hypothetical participants who did not understand the questions could theoretically have picked Likert levels completely at random, and the resulting discrete categorical distribution would still have 80% of its probability mass on positive values, thus surpassing the 50% threshold. Although the raw data distributions (see Supplementary Figures S1 and S2) do not suggest random responses, nor would the observed covariance in the concerns attributed to local and moralistic deities be expected under random responses, the more conservative 80% threshold is needed to rigorously establish a moralization bias. Reliance on this conservative threshold, however, can easily conceal true, non-random responses; e.g., even if 75% of a population were to truly believe that a local deity was intensely concerned with morality, the use of an 80% response threshold would suggest the evidence in favor of a moralization bias to be inconclusive. We caution against relying too heavily on either of these thresholds in a quantitative sense; qualitatively, our data suggest that local deities are generally attributed some level of moral concern, but rigorous quantitative validation of the strength of this “moralization bias” will require additional, purposefully designed field methods (see Purzycki, 2011, 2013; Purzycki et al., 2012).

Figure 3 also shows that the level of moral concern attributed to local deities generally increases as a function of the level of moral concern attributed to moralistic deities. Participants from Yasawa and Sursurunga are exceptions to this trend, as they have a roughly constant, low probability of indicating that their local deities care about morality, irrespective of the value ascribed to the moralistic deities (but we note that this effect is likely driven by the fact that response variance for the moralistic deity questions was very low in these sites; see Supplementary Figures S1 and S2).

In summary, our formal analyses suggest that: 1) around the world, individuals tend to attribute some level of moral interest to local deities; 2) the extent to which individuals attribute moral concern to local deities is related to the sex and education level of participants, and—more substantially—to the extent to which participants attribute moral concern to moralistic deities; and finally 3) the sites in which moral concerns are not attributed to local deities are typically

contexts where commitment to local deities is socially discouraged.

### 2.4.3. *The curious case of the Hadza?*

Recall the lasting debate about the relationship between the presence of morally concerned deities and social complexity from the introduction. Of particular relevance 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, and the associated lack of belief in omniscient/moralizing gods or 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 fact that Hadza life is replete with important ritual behavior and cosmological beliefs. But do they show signs of having a moralistic deity?

They certainly have religious practices with moral implications. Indeed, one of the most important and discussed rituals among the Hadza centers around *epeme* meat-eating and the *epeme* dance that occur on moonless nights. *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](#)). The *epeme* dance 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, inter-camp bonds between males ([Hill et al., 2014](#)).

In the present sample, the Hadza answered the moralistic punishment index questions using a different scale, and could thus not be included in the main analysis, making direct comparison difficult. In [Figure 2](#), however, 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 groups: e.g., the Brazilian Marajó (at level 3) and Cachoeira (at level 2), the Turkana (at level 3), and the Samburu (at level 3). In other words, the Hadza are not answering these questions much differently than many Christians about their god.

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 these deities<sup>6</sup>. 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 S4.1). B.G.P. 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”),

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<sup>6</sup>Note that these deities are often conflated and vaguely defined, hence neither are obviously more or less “moralistic” than the other.

but both deities were otherwise predominantly associated with morality and social harmony. Note again, however, that those sampled were individuals who expressed belief in these entities. 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. Yet, the analyses above suggest that no external influence is required to posit that one's locally salient gods are morally interested. In their exploratory analyses, Stagnaro, et al. (present volume) find no clear relationship between moralization of *Haine* and offers in a Dictator Game, but they find that respondents whose belief in the afterlife resonates with Christian doctrine are more parochially inclined rather than more generous in a wider sense.

To examine the possible role of missionaries in driving any associations between Hadza deities and morality, 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's* and *Ishoko's* concerns. As not everyone who provided free-list responses answered the question about missionaries, the sample for this analysis is reduced ( $n = 40$ ). We dummy coded responses to the question about missionary contact ( $n_{\text{yes}} = 20$ ); those who did not report contact were coded as zeros (19 said “no” and one said he or she didn't know). Out of these 40 individuals, 18 listed moral items in what angers *Haine*, three listed moral items for what pleases *Haine*, 12 listed moral violations for what angers *Ishoko*, and only a single individual listed a moral item for what pleases *Ishoko*. Because of sparseness of data in some sub-domains, and the fact that we asked about two different deities across two differently valenced tasks, we did not aggregate these questions into a single model. 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 that *Ishoko* and *Haine* care about morality (Figure 5; see supplementary section S4.3 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 the odds scale in Figure 5). Focusing just on the posterior mean effect, a female who did not answer affirmatively to having contact with a missionary has a 36% chance of claiming that immoral behavior angers *Haine* and missionary contact increases these chances by only 8%.

There appears to be no clear relationship between missionary exposure and moral content in beliefs about these deities' concerns. These results may, however, only 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

In this report, we find that on average: a) individuals tend to ascribe their deities with at least some moral concern; b) when they do not, it is when the dominant tradition or state frowns upon worshipping the target deity; c) ratings of moral interests are not necessarily very high, even for deities explicitly selected as the most morally interested (many of which are the prototypical “moralistic god” of Christianity); d) there is an individual-level correlation between how morally

interested the two selected deities are conceived to be; and e) being male or more educated decreases the likelihood of associating deities with moral concern. We now discuss these points in light of ongoing discussions about the evolution and effects of supernatural agent cognition.

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), while more recent analyses suggest that belief in broad supernatural punishment is ubiquitous throughout history and across levels of social complexity (Boehm, 2008; 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, answers that only tend to increase with the extent to which these same individuals believe that their moralistic deities are concerned with moral behavior. In other words, local deities exhibit some of the defining properties researchers typically reserve for “moralistic gods”. It is notable that the data do not generally suggest dramatic differences between the deities in terms of moral concern; even among the so-called “moralistic deities”, ratings are relatively low on the Likert scale and quite variable cross-culturally. In short, the construct itself (a deity’s purported moral concern) shows considerable individual-level and cross-cultural variation. These findings illustrate that past society-level constructs (such as *the presence or absence of moralistic traditions* or *culture-level characterizations of gods*) can potentially be quite coarse; accordingly, theories or inferences based on analyses of such constructs may be tenuous or unreliable.

Our analysis of the Hadza data further challenges the proposed relationship between social complexity and the level of moral concern attributed to deities; we highlight the need for systematic, individual-level, data-driven inquiries. Indeed, it is still a common assumption that many small-scale societies somehow lack moralistic deities or traditions (see Beheim et al., 2019; Purzycki and Sosis, 2019, for discussion). Take, for example, the case of the San foragers who have been characterized 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, as in the broader ethnographic record, this example provides only an anecdote and there are notable inconsistencies across sources. Indeed, much of the literature draws the opposite conclusion 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.” The 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, qualitative accounts (or databases utilizing such accounts). Indeed, we find that a substantial proportion of Hadza claim that both of their deities care about morality, and additional free-list data exhibit clear signs that, among believers, moral content and social harmony are some of the most important concerns of these deities. While missionary influence may play some role, it remains to be substantiated with clear evidence.

There is considerable cross-cultural 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. In light of this evidence and our current results, we posit the presence of one mechanism that contributes to religion’s role in human cooperation: namely, that *when individuals infer that spiritual agents are concerned with moralistic punishment they may be less likely to engage in immoral behavior, thus stabilizing cooperative social relationships*. This mechanism may be favored by between-group selection driven by religion’s ability to minimize within-group conflict.

However, others posit that because gods and spirits are inferred to be morally interested and engaged, the association between religion and morality is merely epiphenomenal. In other words, belief in deities assumed to value our moral lives may contribute to the sustained retention of belief in such deities; a moralization bias of deities’ minds might represent something that makes spiritual agent concepts easier to retain and transmit. Some (e.g., Boyer, 2000, 2008) suggest that this form of content-biased transmission largely accounts for the relationship between religion and morality. In other words, religion itself does not causally drive cooperation/prosociality or bond people together in ways that would count as “moralistic” relationships. To assess this empirically, however, we would have to carefully delineate between such biases and explicit concerns—a notoriously difficult task and a fundamental problem for research that assumes the distinction (see Purzycki and Willard, 2016). One way to disentangle these processes might be to employ a response-time task to determine whether or not participants are quicker to answer questions about gods’ knowledge of moral information than similarly phrased trivial information, and then investigate if the response patterns correspond to culturally prototypical beliefs (Purzycki et al., 2012; Purzycki, 2013).

If we take the present survey data as representative of *explicit* beliefs—as is often the standard in the social sciences—this strengthens the case for the cross-cultural ubiquity of “moralistic” deities; previous generations of researchers have probably underestimated the ubiquity of such deities (and perhaps also overestimated how important they have been in cooperation), particularly as so few have actually directly asked people about these topics. If, however, we interpret the results as indicative of an implicit bias, the question of whether or not explicitly moralistic deities 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)<sup>7</sup>.

In fact, no study to date has found a reliable relationship between cooperation—however broad—and deities’ explicit association with morality (see Stagnaro et al., 2019). While some (e.g., 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 in these studies were predominantly identified as constituents of the local moralistic religious tradition (cf. Apicella, 2018, and Soler, et al., present volume) and *not* of the local deities’ tradition itself<sup>8</sup>. Moreover, as assessed with these scales, moral concern played

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<sup>7</sup>Some (e.g., 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.

<sup>8</sup>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.



no detectable role in allocations across deities; the moralistic punishment index used herein 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 feature careful deity selection, consider the conflict/harmony between selected deities, account for key variables in the wider cultural context, and use appropriate modeling frameworks.

In conclusion, our results serve as a good reminder that attempts to account for the ubiquity of so-called “moralistic gods” or “traditions” should not uncritically embrace such constructs without precisely addressing: 1) what they mean conceptually; 2) what they mean operationally; 3) what theory *actually* says or does not say; and 4) how the attempt to examine predictions empirically follows from points 1–3. Indeed, virtually all previous cross-cultural research (e.g., Boehm, 2008; Botero et al., 2014; Johnson, 2005; Peoples and Marlowe, 2012; Roes and Raymond, 2003; Stark, 2001; Swanson, 1964; Watts et al., 2015a; Whitehouse et al., 2019) has relied upon qualitative sources of variable methodological rigor to code group-level properties, such as the presence or absence of moralistic (high) gods. Often using the same data and coding schemes, many of these studies find correlations between creator gods at the top of a divine bureaucracy and societies with actual bureaucracies (cf. Beheim et al., 2019). The systematic inquiry of what *individuals* think their gods care about using contemporary social scientific methods, however, only began a decade ago. Purzycki (2011) found that when directly asked, participants from the Tyva Republic associate their deities with moral concern, even when their culturally postulated concerns lie in the domain of ritual and resource preservation. The current study replicates this finding across a wider range of cultures and deities. However, it leaves the door open for future studies investigating the predictors of between-site variance in the moralization of deities.

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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 B.G.P. wrote the bulk of the R code for the supplementary analyses. B.G.P. and C.T.R. produced all illustrations. 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 to this article—including data, R scripts, and methods protocols—can be found online at [https://github.com/bgpurzycki/gods\\_moralization\\_bias](https://github.com/bgpurzycki/gods_moralization_bias).

## 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 [https://github.com/bgpurzycki/gods\\_moralization\\_bias](https://github.com/bgpurzycki/gods_moralization_bias).

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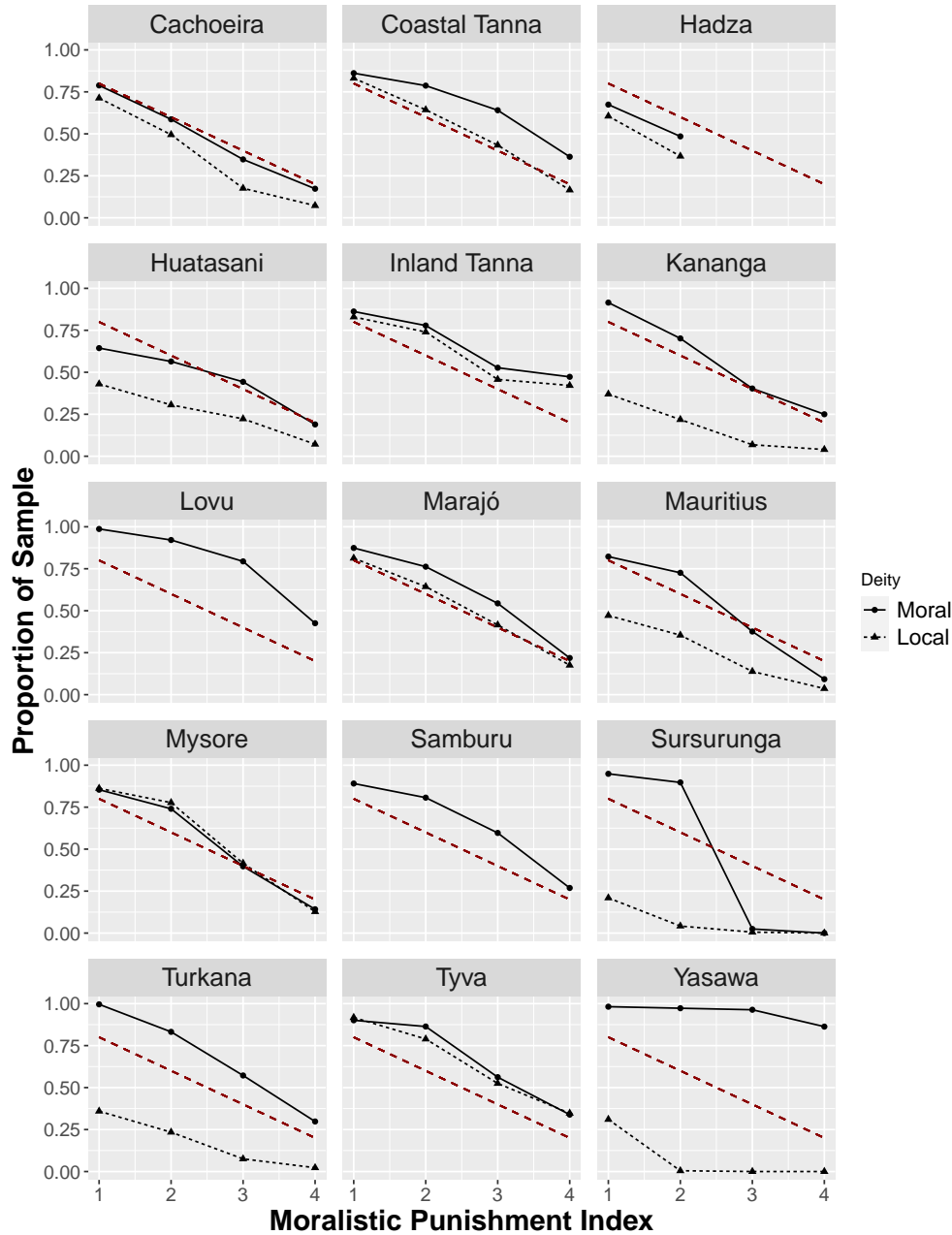


Figure 2: **Moralistic punishment index for “local” (dashed) and “moralistic” (solid) deities across sites.** The Likert-scale was set on a 0 to 4 range for all sites other than Hadza who answered different questions (e.g., *Does Haine/Ishoko punish people for stealing?*). Hadza responses were on a scale from 0 to 2 (no; I don’t know; and yes). In all other sites, the base value of 0 indicates that the deity is believed to not care at all about punishing immoral behaviors. 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. The y-axis value for an x-axis value of 1 thus gives the probability of respondents indicating that their indicated deity cares at least somewhat about punishing immoral behaviors. The red lines show the curves corresponding to a discrete uniform distribution across categories. To interpret the plot, consider the Turkana data; note that the solid black line has a y-axis value of close to 1.0 for an x-axis value of 1, indicating that almost everyone believes that the moralistic deity cares about punishing immoral behaviors at a Likert-level of 1 or greater. However, only around 55% of respondents believe that the moralistic deity cares about punishing immoral behaviors at a Likert-level of 3 or greater.

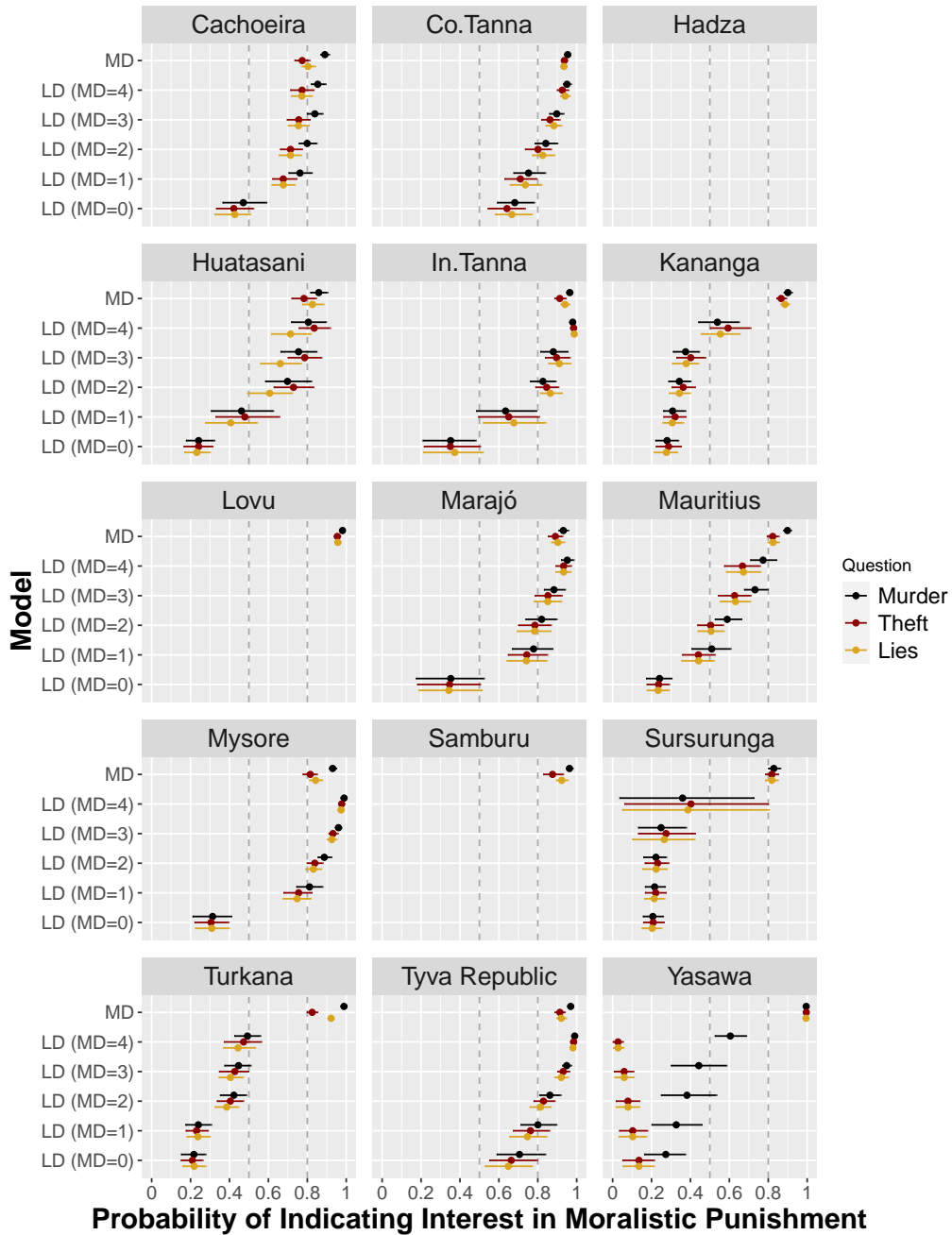


Figure 3: **Probability of positive responses to questions about the moral concerns of local (LD) and moralistic (MD) deities across sites.** Intervals are 90% credibility intervals. The rows labeled MD reflect the probability of a positive response for the moralistic deities. The rows labeled LD reflect the probability of a positive response for the local deities when respondents claim that the moralistic deities (MD) had the indicated level (Likert-scale) of moral concern. 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.

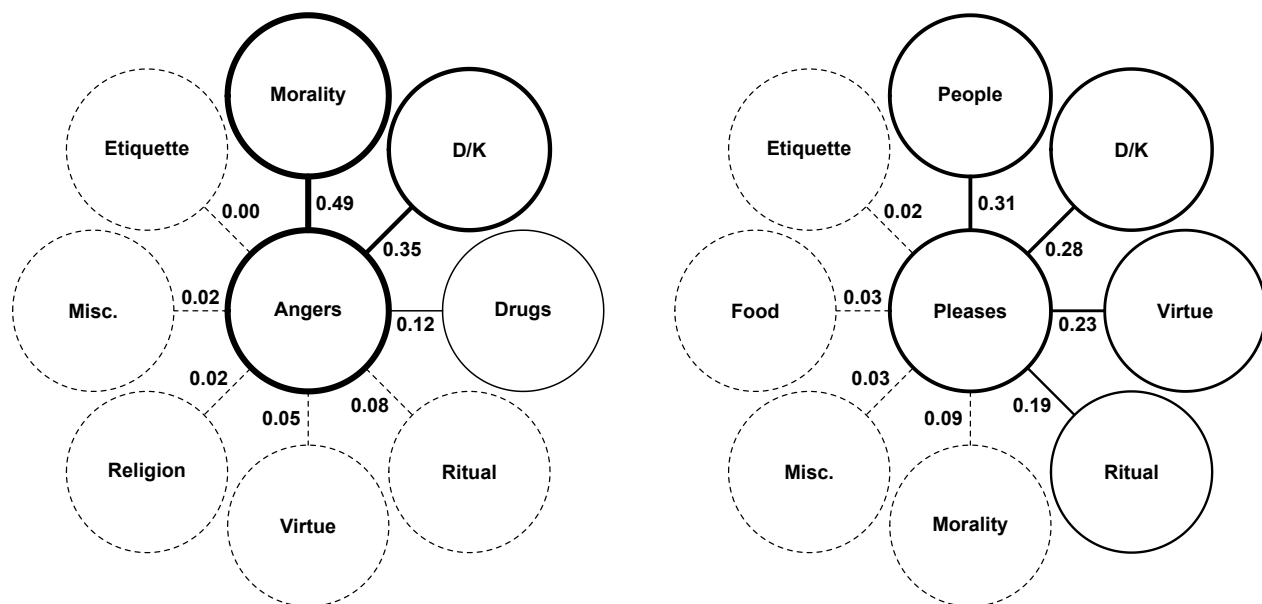


Figure 4: **Cultural models of what angers (left;  $N = 57$ ) and pleases (right;  $N = 58$ ) *Haine*.** Values reflect the *saliency* of items; saliency increases as a function of item ubiquity in the sample and the placement of items on individual lists. Note that these data were collected only among those who expressed belief in *Haine*. Dotted lines indicate item types with saliency  $< 0.10$ . “D/K” refers to “I don’t know”. Note that *Ishoko* data were very similar, so we only present one deity here (see Supplementary Section S4.2 for results across both gods).

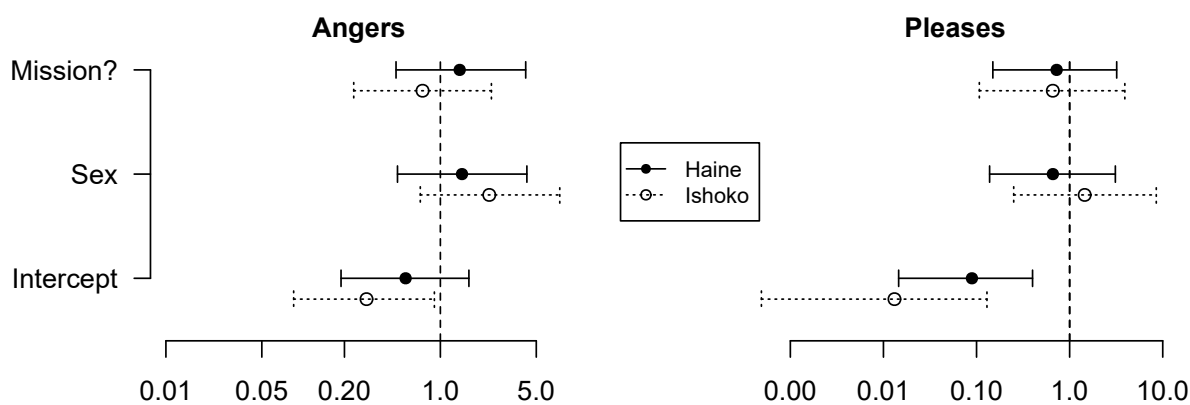


Figure 5: **Exponentiated estimates (odds ratios) of the likelihood of listing an item coded as “morality” in free-list tasks about what angers (left) and pleases (right) two Hadza deities ( $n = 40$ ).** The vertical dotted lines mark the threshold of no effect. The X-axis is on a logarithmic scale. See Supplementary Section S4.3 for model structure and estimates.