

The Evolution of Gods' Minds in the Tyva Republic

by Benjamin Grant Purzycki

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As appeals to what gods know and care about often motivate and rationalize human behavior, understanding shared models of gods' minds is crucial for understanding religion's contributions to human sociality. If religious systems function to minimize the effects of social and ecological problems, then models of gods' concerns should coevolve with these problems. The present work assesses this prediction using data collected in the Tyva Republic. After briefly introducing the social and ecological history of ritual cairn piety in Inner Asia, I examine explicit representational models of morality, virtue, and gods' concerns in Tyva. I show that (a) there is very little conceptual overlap between Tyvans' models of morality and virtue and the things about which spirits care, (b) Tyvan spirit masters are primarily concerned with ritual and breaches of resource maintenance, and (c) among the emerging, salient factors that anger spirit masters are alcohol abuse and littering, very recent social problems in the region. This report provides support for the hypothesis that representational models of gods' minds will evolve in accordance with ever-shifting local problems and offers the first formal treatment of empirically determining what constitutes a "moralistic" deity among living people.

All human communities face problems of cooperation and coordination (Cronk and Leech 2013). With respect to how religion contributes to the resolution or reduction of these threats to sociality, some emphasize the role of supernatural monitors and punishers that curb antisocial behavior and/or boost prosocial behavior toward in-group members (Bering and Johnson 2005; Johnson 2005; Johnson and Bering 2006; Norenzayan 2013; Schloss and Murray 2011). Others find that ritualized costly signals and other behavioral forms of commitment can keep potential defectors out of groups as well as convey trustworthiness and "cooperative intentions" to others (Bulbulia 2004; Irons 2001; Purzycki and Arakchaa 2013; Ruffle and Sosis 2006, 2007; Soler 2012; Sosis, Kress, and Boster 2007; Sosis and Ruffle 2003; Tan and Vogel 2008; Xygalatas et al. 2013).

While religion often appears to address such problems, and there are a few exemplary ethnographic studies of religion's measurable effects on fitness gains (Bliege Bird 2013; Lansing 1987, 1991; Lansing and Kremer 1993; Rappaport 2000; Strassman 1992; Strassman et al. 2012), little is known about how the content and form of religious traditions change through time to meet emerging challenges. Contemporary systems views of religion seek answers to this question by examining (a) the

constituent parts of religion, (b) how these parts link together, (c) how these parts and links function, and (d) how alterations in the constituent parts alter other components (see Alcorta and Sosis 2005; Bulbulia 2008; Johnson et al. 2015; Malley 1995; Purzycki and Sosis 2009; Sørensen 2004; Sosis 2007; Sosis and Kiper 2014). Systems approaches motivated by evolutionary theory attend to the ultimate reasons for these links by testing the hypotheses that religion can minimize the costs incurred by social and ecological problems and that key components of religious traditions will evolve in response to shifting pressures (Purzycki, Haque, and Sosis 2014; Purzycki and Sosis 2010, 2011, 2013; Shariff, Purzycki, and Sosis 2014).¹ In this report I address these concerns by examining one religious system in the Tyva Republic (Tyva) with a particular emphasis on representational models of gods' minds.

1. Though significantly distinct from traditional forms of functionalism (see Shariff, Purzycki, and Sosis 2014; Smith and Winterhalder 1992), this view sympathizes with some of its premises (Durkheim 2001 [1915]; Harris 1979; Malinowski 1939, 1964; Rappaport 1979, 1999; Wilson 2002) insofar as it views components of religion as not only corresponding to but also often minimizing the deleterious effects of the risks inherent in being a member of a social species. This view also predicts, therefore, that if the specific risks shift, features of the religious system will also shift in accordance with different problems. However, contemporary empirical approaches are necessarily piecemeal and attempt to test for the presence of patterns and their effects rather than rely exclusively on intuition and interpretation.

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In the present work, I first discuss the significant relationship between conceptions of gods' minds and human sociality. I then provide a brief portrait of the social and ecological history of the ritual cairn system in Inner Asia and argue that local deities' associations with cairn piety likely emerged as a response to the pressures inherent in the pastoralist economy. Drawing from this association, I then detail Tyvans' explicit models of what gods care about and assess the degree to which these models overlap with local models of morality and virtue. Finally, I calculate the degree to which current social problems contribute to the content of gods' concerns and the source of these changes.

Gods' Minds and the Religious System

Appeals to and perceptions of gods' minds play a critical role in religious cognition and communication (Purzycki and McNamara 2016; Purzycki and Sosis 2011). Central to religious cognition is our ability to mentally represent and reason about other minds (i.e., our "theory of mind" or "mentalizing" abilities; Baron-Cohen 1995; Premack and Woodruff 1978). As humans promiscuously attribute mental states to objects in our world in order to make sense of them, religion stems from this ancestral trait insofar as we seek to explain the mysterious or potentially dangerous in terms of an agent (or agents) who often possesses powers beyond our own (Barrett 2004; Barrett and Keil 1996; Dennett 1971, 1987; Guthrie 1980, 1995). Indeed, variation in individuals' readiness to attribute agency to other entities (e.g., people, objects, events, etc.) predicts variation in religiosity (Norenzayan, Gervais, and Trzesniewski 2012; cf. Reddish, Tok, and Kundt 2016).

With respect to agency detection's effects on human sociality, experiments show that exposure to "natural" (e.g., a photo of two eyes; Ernest-Jones, Nettle, and Bateson 2011; Haley and Fessler 2005; Nettle et al. 2013; Powell, Roberts, and Nettle 2012) or "supernatural" (Bering, McLeod, and Shackelford 2005; Piazza, Bering, and Ingram 2011; Randolph-Seng and Nielsen 2007; Shariff and Norenzayan 2007) cues can increase prosociality or reduce antisocial behavior. So, while detecting gods' minds might be possible by virtue of the same underlying cognitive faculties used for making sense of humans' minds, there is also evidence that detecting supernatural minds also engages the regulatory systems we use in everyday social interactions (Purzycki 2013a; Purzycki et al. 2012).

While this research may account for the machinery that makes representing gods' minds possible and how detection of these minds affect our sociality, people regularly make explicit appeals to the mental states of the gods through prayer, pleading, claims of their desires and motivations, and rituals devoted to them. Under some conditions, variation in explicit beliefs about gods' desires to punish predicts fair play in experimental economic games (McNamara, Norenzayan, and Henrich 2016; Purzycki et al. 2016; Shariff and Norenzayan 2011). Cross-culturally, people claim that their gods care about fairly discrete sets of things that appear to correspond to specific conditions.

By implication, models of gods' minds may evolve to harness the aforementioned effects of supernatural agency and social cognition under new conditions (Purzycki 2011; Purzycki and McNamara 2016; Purzycki and Sosis 2011). There are a few lines of evidence suggesting that this is the case.

For example, commitment to moralistic, punitive "high gods" curbs temptation to defect in prosocial norms in contexts with heightened anonymity and unaccountability or in cases where valuable resources are scarce (Botero et al. 2014; Johnson 2005; Lahti 2009; Norenzayan 2013; Peoples and Marlowe 2012; Rappaport 1999; Sanderson 2008; Stark 2001; Swanson 1960; Wallace 1966; cf. Watts et al. 2015a). Despite the importance of these works, they suffer from a few limitations. First, they exclusively rely on cross-cultural or cross-national databases that were not explicitly designed to answer such questions. Second, target variables are biased to specifically ask questions about "moralistic" deities (i.e., those that care about "morality") rather than whatever "nonmoralistic" deities might care about (cf. Boehm 2008; Purzycki 2011). Third, what exactly constitutes a "moralistic" deity largely escapes scrutiny.²

Other work attempts to identify what makes god concepts particularly salient and memorable, arguing that it is gods' knowledge of "socially strategic information" that makes them especially important factors in cultural transmission (Atran 2002; Barrett 2008b; Boyer 2001, 2002; Purzycki et al. 2012). Socially strategic knowledge is "the subset of all the information . . . that activates the mental systems that regulate social interaction" (Boyer 2001:152). Note, however, that "everything" and "anything" can be construed as socially strategic, "moral," or "virtuous" depending on the context. This suggests that gods' concerns ought to be quite general. Yet we know that what constitutes "moral" domains varies across space and time emically (see Shweder, Mahapatra, and Miller 1987; Shweder et al. 1997) and etically (see Haidt 2008; Rossano 2008; Smetana 2006:121; Turiel 1983:3). While the luxury of post hoc etic views of gods' concerns allows us to characterize anything we want as "socially strategic" or "moral," doing so fails to explain these concerns; it ignores cross-cultural variation as well as the distinction between emic with etic conceptions of

2. For example, studies utilizing the Standard Cross-Cultural Sample (Murdock and White 2006) to examine the evolution of "moralistic High Gods" rely on a single question (no. 238). This question defines a "High God" as "a spiritual being who is believed to have created all reality and/or to be its ultimate governor, even though his/her sole act was to create other spirits who, in turn, created or control the natural world." Of the five options in this question, one characterizes such gods as those who are "present, active, and specifically supportive of human morality." Is "supportive of morality" adequately represented by a dichotomous variable? What do we mean by "morality"? Whose morality? What is the form of "support"? How ethnographers and the coders of their works determined the answers to such questions is unknown (see Boehm 2008; Johnson 2015). In essence, such studies report evidence of the presence or absence of ethnographers' mention of something that approximates to gods being "specifically supportive of human morality."

these domains (see n. 2). Additionally, this maneuver also ignores the fact that gods do not care about all kinds of “socially strategic” information equally (Purzycki 2011; Purzycki and McNamara 2016; Purzycki and Sosis 2011).

Here I seek to overcome these limitations by assessing representational models directly from people by assessing the hypotheses that (1) gods care about “socially strategic information” generally, (2) explicit representational models of gods’ concerns will point to salient, locally specific problems and ways to minimize their effects, and (3) changes in locally specific problems should predict changes in the content of belief sets. Using naturalistically collected freelist data in the Tyva Republic of southern Siberia, I offer the first formal assessment of the degree to which gods care about “morality.” In order to properly contextualize the present case study, I now turn to the major factors that contributed to the evolution of religion in Inner Asia.

The Social and Ecological History of Ritual Cairns in Inner Asia

Throughout Inner Asia, local deities are linked to ritual practices at designated locations. Some of the locations are marked by cairns made of stones or branches, often found on territorial or political borders (see CA+ online supplement A5 for image; CA+ supplements A1–A5 are available online in a PDF), while some are located at specific resources or features of the natural environment. This ritual system appears to have emerged in response to the hunting and pastoralist economies of the region. Pastoralism in particular requires access to grazing land to sustain and increase the size of herds. Eventually, this requirement introduces the problem of competition over land and livestock with neighbors. One way to address this problem is to territorialize.

Under certain conditions, territorializing is an optimal strategy for resource regulation as it can minimize the costs associated with territorial conflict (Cashdan 1983; Dyson-Hudson and Smith 1978; Johnson and Toft 2014). As Christian (1998) suggests, “the inherent instability of pastoralist lifeways leads to a constant jostling for pasturelands and inhibits the emergence of a strong sense of individual or even collective property in land. Jostling for land, and uncertainty about ownership lead to frequent raiding and sometimes large-scale warfare” (87; see also Irons 1974). This competition over access to land for herds can coevolve with concepts and claims of stewardship or ownership; regions and resources considered to be held by a specific family are only thought of as “owned” in a context where others may exploit these regions and resources. Raiding establishes the need for increased group cohesion and military discipline, particularly among males (see Beckwith 2009). Once specific sections of land become associated with specific people, respecting that association requires monitoring and maintenance, something fairly difficult in contexts where your neighbors are not immediately accessible and external institutions (e.g., a border patrol) are absent.

Indeed, historians and ethnographers of nomadic Inner Asia have long examined the complicated relationship between pastoralism, territoriality, and status (Lattimore 1947:39). In the case of Tyva, Vainshtein (1980) notes that “it was normal for each *aal* [household/campsite; Mongolian *ail*] to have its own more or less traditional migration routes which were followed year after year. Knowing this, Tuvian herdsman . . . avoided grazing their cattle along the routes of other *aals*” (84). The fact that groups develop predictable migration patterns and avoidance strategies suggests conflict can indeed arise if others can threaten access to grazing land and livestock. As mentioned above, one significant ecological problem that pastoral populations face is maintaining territory when populations are diffuse; as *aal* seasonally move on land recognized as “theirs,” there should be some mechanism to ensure relatively stable relations across *aal* in terms of access to pasture and the reduction of livestock theft. Moreover, territoriality presupposes a fairly predictable pattern of resource exploitation (cf. Irons 1974). It is under these conditions that the ritual cairn complex in Inner Asia likely developed.³

If features of religious systems do indeed mediate problems of cooperation and coordination, evidence should point to religious beliefs and behaviors corresponding to these issues of territoriality and resource maintenance. Given the aforementioned studies, “strategically” placing supernatural indices and concomitant rituals on territorial borders may minimize breaches of territorial recognition while collective rituals held on such places may reaffirm that territory by ritualistically strengthening bonds (Purzycki 2010, 2012). There are at least three compelling lines of evidence suggesting this might be the case in Inner Asia.

First, there is abundant evidence that ritual cairns (*obo*, *oboo*, *ovoo*, *ovaa* are regional variants of the term; see below) are indeed located on territorial borders throughout Inner Asia and beyond, among other pastoralist traditions (see Purzycki 2012:341–360; Sierksma 1963). Humphrey and Onon (1996) note that each Daur village in Mongolia “had its own oboo cairn for worship, and they were also separated from the next by another kind of smaller oboo which marked the boundary” (22). Vreeland (1953:11) observed that after a boundary dispute

3. While the archaeology of ritual cairns in Inner Asia is fairly scant, some of the earliest dated cairns are from the “deer stone-*khirigsuur* complex” in Mongolia (Fitzhugh 2009a, 2009b), “which generally consist of a central stone mound, a square or circular ‘fence’ of surface stones, as well as small stone mounds and circles” (Allard and Erdenebaatar 2005:548). Researchers regularly attribute these monuments to the third through the first millennia BCE nomads of the Early Iron Age. The oldest *khirigsuur* contained antler fragments that were carbon dated to 2350 ± 40 (2470–2330 cal BCE; Wright 2006:207–210), and in the bulk of excavations, the central cists showed no human remains and no evidence of looting. This suggests that the primary function of these monuments was indeed devotional rather than funerary (Wright 2006, 2007). Note that such archaeological evidence suggests that these cairns followed the advent and stabilization of pastoralism in the region (ca. 6000–4000 BCE; Anthony 2007; Christian 1998; Khazanov 1994; Kuz’mina 2008; Outram et al. 2009).

in Mongolia, the “official boundary lines” of some small communities were then marked with stone cairns. Clearly, then, there is a close relationship between land, family, community, and ritual cairns in such cases.

Second, the etymology of the local term for sacred cairns appears to be linked to terms for pastoral social units throughout the Turkic-speaking world. Sneath (2007:146) documents how in Mongolia the Qing imposed on its subjects “administrative and tax units used by both Russian and Iranian states” as well as the Turkmen. These units were called *oba* (*ova*, *obog*, *obúg*, *ovog*). Among the Iranian Yomut,

The smallest residence group was a group known in Turkmen as an *oba*. This consisted of a group of households which together shared a joint estate with reference to a defined stretch of territory known as the territory of the *oba*. All members of the *oba* had a right to camp and pasture their livestock anywhere on the *oba*'s territory. Outsiders could do these things only after obtaining permission from the residents. Any joint action by the group had to be based on a consensus reached through discussion among the men of the community. Each *oba* had a headman selected by the group, but his role was merely that of spokesman for the group to outsiders. He had no authority to act other than on the basis of the consensus of the group. (Irons 1974:640)

Third, ritual participation has a significant effect on interpersonal relationships. Researchers have observed that participation in collective cairn rituals builds and conveys solidarity (Humphrey 1995; Sneath 1992). Indeed, Tyvans are also more likely to trust people who regularly make offerings at ritual cairns (Purzycki and Arakchaa 2013). Moreover, many neighboring hunting and fishing groups mark territory using supernatural indicators. The Khanty, for instance, mark hunting territories and settlements with crafted spirits' houses embedded in trees. Outsiders are supposed to give the spirits proper respect upon entering others' territory (Jordan 2001, 2003). In this sense, then, ritual cairns and other forms of border sacralization may function as psycho-behavioral primes that trigger the social responses found in the aforementioned experimental literature.

In summary, if territorializing evolved as a response to ensure access to certain areas and to minimize the costs of conflict, territorialization suffers from the problem of maintenance, and if the coupling of gods and rituals can function to curb antisocial behavior, then one solution might be to spatially distribute cairns devoted to local gods along borders to maintain respect for territory (Purzycki 2010, 2012). As discussed below, spirits associated with exploitable natural resources may also function to curb problems of overexploitation or sully those resources. Shared models of gods' concerns ought to point to rituals at these places. Additionally, indices of newer problems that stem from contemporary conditions should be evident in these models. As I examine these hypotheses in the Tyva Republic, I now turn to a brief characterization of the religious landscape there.

Religion in the Tyva Republic

The Tyva Republic (Tyva, or popularly known as “Tuva”) lies just north of western Mongolia, surrounded by the republics of Altai, Khakassia, and Buryatia. The landscapes and economies of Tyva are notably diverse. The northeastern region (Tozhu) is host to small villages and reindeer herders. The central steppe and western taiga regions host herders of sheep, goats, and cattle. Tyvans represent an ethnic majority in the republic (~80%, with the remainder predominantly ethnic Russians), and an overwhelming majority (99.6%) of Tyvans claim Tyvan as their native language (Chevalier 2010). Roughly half of the republic's total population (~310,000) lives in rural villages and/or yurt and lodge encampments, while the other half live in the capital city of Kyzyl and the asbestos-mining town of Ak Dovurak.

Despite Soviet repression and influence and the subsequent cultural and economic reconfigurations brought about by market integration (see Donahoe 2002, 2003), Tyvans have successfully maintained and reinvigorated their cultural heritage, with strong ties to what some might consider the “traditional” religion, economies of nomadic pastoralism, hunting, and fishing and resurgence in forms of the visual, musical, and literary arts. Notably, however, inexpensive and readily accessible alcohol has taken its toll. In 2009, Tyvan females ranked among the 10 highest among Russian populations for alcohol-related mortality (82.5 per 100,000), and males ranked the highest for fatal accidental alcohol poisoning (74.6 per 100,000; Semyonova et al. 2014). Moreover, between 1991 and 2005, Tyva had the highest regional homicide rate per capita in Russia (118.25 per 100,000, while the second highest, Irkutsk, was 66.14; Treyger 2011:18).

The two officially recognized religions in the Tyva Republic are shamanism and Buddhism, and the two are often syncretically intertwined throughout Buddhist Inner Asia (Evans and Humphrey 2003; Heissig 1980:103–110). Of central importance to religion in rural Tyva are local spirit masters (pl. *cher eeleri*, literally “master” or “owner” of the place) of specific regions and resources. As is the case in much of Inner Asia, various types of sacred sites and places pepper the landscape of Tyva. Mineral springs (*arzhaan*), lakes (*khöl*), and other natural areas are often marked by places to leave a ritualized offering to spring and lake spirit masters as well. Spirits associated with natural resources are more likely to be zoomorphic, whereas anthropomorphic spirits typically govern territories and vaguely defined areas such as mountain ranges and forests (Purzycki 2013b). As in the case of other regions in Siberia (Halemba 2006:78–82), collective cairn rituals typically occur seasonally, while many stop at *ovaa* in transit. The former are region-wide, typically male-only affairs that entail considerable costs (e.g., hiring a shaman or lama, killing livestock for food, travel, ritual accoutrements, etc.), whereas the latter are relatively low in cost (see below).

In qualitative interviews (Purzycki 2010), Tyvans explain *ovaa* piety as honoring local spirits and being thankful or

hopeful for a safe journey. Most of the explanations are bound in notions of territoriality, and as already discussed, families controlled traditional migration routes and regions. For instance, one man noted that “each *aimak* [tribe or extended family] has its place: the Mongushes, Kuulars, Khomushkus, Oorzhaks . . . have different places, trees to pray to [for example]. Torgalyg’s people have a pine-tree. [Some have] even three or four places. And the Kuulars have their place too” (27).⁴ Kristensen (2004) claims that the “Duha Tuvianians [*sic*; of Mongolia] perceive human fate . . . as intimately connected with the deeds of their ancestors, who influence them through specific natural entities located in the local landscape. Each patrilineal clan has its own sacrificial mountain oboos . . . which they describe as ‘my mountain.’” Moreover, “commonly known oboos and sacrificial trees are distributed along the migration routes of past generations.”

At the base of many *ovaa* there are collection bowls for the spirit masters (*cher eezi*) of the place; in the case of remote *ovaa*, people place offerings on or in the *ovaa* itself and/or add a stone or branch. In many cases, springs and lakes will not have cairns but will have nearby trees or bushes by which to make offerings in the form of prayer ties (*chalama* or *kadak*). When one approaches a sacred place, one makes a prayer to the *cher eezi* by offering food, tobacco, and/or various amounts of money. At cairns, one quietly walks around the perimeter of the *ovaa* three times in prayer, thinking only good thoughts so as not to excite the spirits. In one episode from my experience, my hosts’ river water was sullied by a recent rain. We drove to our neighbors’ *aal* to fill up large milk jugs with the water from a spring near the neighbors’ yurts. Before extracting water, we tied prayer ties around the tree and threw coins near the spring’s source to honor its spirit master. As we performed this ritual, the neighbors watched us from their yurts and waited until we were filling the jugs to come down to the spring to socialize.

As spirit masters are associated with rituals at territorial borders and various resources, Tyvan beliefs about their concerns should reflect this. If ritual behavior is thought of as a salient feature of what it means to be moral—good or bad—then Tyvans should readily report this. If spirits are thought of as concerned with general “morality,” then the targets of spirits’ concerns should consist of moral behavior. To determine this requires examining Tyvan models of morality and spirits’ concerns and measuring the degree to which the content

of these domains overlap. Moreover, if cultural models of gods’ concerns point to social and ecological problems, newly emerging problems should also be salient features of those models. If so, then Tyvan spirit masters’ concerns should indicate a shift toward the problems that affect contemporary Tyvan social life.

Study

Methods

Interviews consisted of a battery of instruments including (1) standard demographic and religiosity questions, (2) free-list tasks, and (3) a survey about spirit masters’ concerns and knowledge (Purzycki 2011, 2013; see Purzycki 2012:406–414 and CA+ supplement A4 for interview materials). An assistant translated the interview protocol into Tyvan, then another back-translated it into English, and we subsequently edited it for consistency and clarity.

Demographic variables included age, number of children, years of formal education, years of living in a city, whether people were born in a rural or urban environment, and self-assessments of fluency in the Tyvan language on a five-point scale (knowledge of Tyvan was rated as 0 = none; 1 = not good; 2 = good; 3 = very good; 4 = fluent).

I used freelist tasks to elicit data about Tyvans’ belief sets. Freelists (see Borgatti 1998; Quinlan 2005; Smith 1993; Smith et al. 1995) provide a naturalistic way of examining representational content domains and are far more informative than surveys regarding emic models of gods’ concerns. Elsewhere, I (Purzycki 2011, 2013a) found that while cultural consensus models resoundingly demonstrated that there was no such consensus, Tyvans will nevertheless claim spirit masters know and care about moral behavior in a post hoc fashion when answering survey questions. Perhaps due to a latent moralization bias of supernatural agents (see above), participants are more inclined to respond affirmatively to direct questions about whether or not the gods care about moral behaviors even though these are not necessarily salient associations for people. As this study seeks a better grasp on the degree to which explicit models of morality/virtue overlap with models of gods’ concerns, a naturalistic method such as a freelist task is more appropriate.

Participants completed four freelist tasks (of 10–15 items each), classed into two domains that included two subdomains each. One domain—morality/virtue—required that participants list the things that constitute (1) a good Tyvan person and (2) a bad Tyvan person. In the spirit masters’ concerns domain, we asked for (3) things that please or make *cher eezi* happy and (4) the things that anger or displease them. Assistants and I recorded all freelist data in the order in which they were listed in order to calculate cognitive salience (see CA+ supplement A1 for calculations). After translating all data into English, we then cleaned it, coded it, checked it for errors,

4. Organizational units in Inner Asia have been subject to misrepresentation and distortion over the years on the part of anthropologists and imperialists alike (Sneath 2007). To take one example, Sneath notes that “The Mongol term *aimag* [similar to Tyvan *aimak*] was conventionally translated into Chinese as *buluo*. In the Qing period, the *aimag* was the large administrative division into which the local principalities called *khoshuu* [k*ozhuun* in Tyvan] . . . were grouped. . . . But in historical documents, the word is commonly translated as *tribe* . . . and in official Mongolian histories the term *aimag* became the standard term to describe ‘tribal’ pre-Chinggisid political formation” (66–71).

and subsequently made minor corrections. No individuals repeated items within lists; thus, there were no concerns of salience inflation.

To measure religiosity, I adapted an eight-item religiosity scale (Nicholas 2004; Nicholas and Durrheim 1995; Rohrbaugh and Jessor 1975; see CA+ supplement A4) anchored at zero. Three individuals answered with more than one answer on the prayer frequency question, and these values were converted to means. This religiosity index had good reliability ($\alpha = .76$) and was converted to sums for each individual. Additionally, we asked for self-reports of the frequency of *ovaa* piety and shaman visitation frequency using five-point Likert scales anchored at zero. As including both of these questions in the religiosity scale slightly lowered the alpha, and as these are culturally specific questions, they were treated as separate items from the religiosity index.

In order to assess whether or not models of spirit masters' minds were influenced by external sources, two questions had to do with the degree to which participants interacted with people from other religious traditions. One question (five-point scale anchored at zero) asked, "How much do you participate in religious activities with people who have a different religion from yours?" The other (six-point scale) asked, "How often do you discuss religion with people who have a different religion from you?"

Drawn from previous interviews (Purzycki 2010), one question sought to capture the variation in Tyvans' sense of what *cher eezi* are. The options were (a) creations of nature, (b) ancestors, (c) creators of nature, and (d) "other," with space to provide a response. We also asked participants about the breadth of knowledge they attribute to spirit masters (a four-point "omniscience scale") with the following options: (1) He/She/It only knows what happens to her; (2) He/She/It only knows everything that happens in her area; (3) He/She/It only knows everything that happens in Tyva; and (4) He/She/It knows everything that happens in the world.

Participants

Local assistants and I conducted interviews in the capital city of Kyzyl between the months of March and August of 2010. We approached ethnic Tyvans in various places around the city (schools, clinics, shops, etc.), asked them whether they could speak Tyvan well and whether they were interested in participating in an interview that would take about 30 minutes. This sample ($N = 87$; 49 women; 9 did not report sex) consisted of adults from various regions throughout Tyva who were of various religious self-identifications (52 Buddhist, 2 shamanist, 21 Buddhist-shamanist, 1 Buddhist-Christian, 1 answered "other" with no additional information listed, and 10 did not answer). The "other" was treated as a missing value (NA). These responses were subsequently condensed to a dichotomous variable to denote explicit self-identification with shamanism; those who self-identified as any form of

shamanist were given a score of 1, and all others were given a score of 0.

The urban index is the proportion of years spent living in cities to participants' ages (two did not know). On average, participants lived in urban environments for about half of their lives ($M = 0.54$, $SD = .31$). Regarding participants' birthplace, while 11 individuals did not provide an answer, out of those who did, 57 (75%) were born in rural areas, and 22 were born in a city or larger town. Overall, Tyvans reported their competence in the Tyvan language as "very good" ($M = 3.32$, $SD = 1.01$) and had an average of 14.16 years of formal education ($SD = 4.56$). One individual reported "three to eight" years, which was converted to the mean of 5.5. One individual did not know, and this response was treated as a missing value.

Table 1 details the sample's basic demographic and religiosity statistics, and table 2 is a correlation matrix of these variables. Note that religious participation and religious discussion with religious out-group members had a strong correlation (Pearson's $r = 0.62$, $P \leq .001$). To avoid issues of multicollinearity, I focus here on discussion of religion with religious out-group members.

Results

Spirit Masters

Tyvans conceive of spirit masters primarily as creations of nature ($N = 32$; 43.24%). Twenty-one (28.38%) responded that spirit masters are ancestors, whereas fourteen (18.92%) suggested that they are creators of nature. Among those who answered "other" ($N = 7$; 8.05%), one answered "both ancestors and creations of nature," whereas the rest provided no response ($N = 13$; 14.94%).

Accounting for Cairn Piety

Though there was notable variation in previous qualitative interviews (Purzycki 2010), some casual accounts suggest that stopping at every *ovaa* one passes is obligatory (Carruthers 1994 [1913]:245; Harrison 2007:123). Table 3 details the self-reported proportion of *ovaa* at which Tyvans stop. While 65.52% of the participants claim they stop at half or more of the *ovaa* they pass, 48.28% of the participants claim they stop at most or all of the *ovaa* they pass. Even though 22.99% seldom or never stop, there is a clear overall emphasis on stopping (or at least claiming to) at the majority of *ovaa*.

In order to account for *ovaa* piety, I regressed *ovaa* visitation frequency with the other target variables (table 4). Age, years of formal education, and fluency in Tyvan were centered at these respective variables' means. Models were backward-selected from the full model (model 1), which includes all focal variables and an interaction term of reporting being a shamanist and the shaman visitation frequency (see CA+ supplement A3 for analytical notes). Model 2 removes this

Table 1. Basic demographics and religiosity variables

Demographic	N	Scale	M	SD	SE	NA
Age	76	...	38.95	13.56	1.56	11
Children	73	...	1.93	1.37	.16	14
Years of formal education	74	...	14.16	4.56	.53	13
Urban index	70	0–1	.54	.31	.04	17
Tyvan language fluency	78	1–4	3.32	1.01	.11	9
Religiosity index ^a	78	0–33	20.33	5.06	.57	9
Shaman visitation frequency ^a	75	0–4	.69	.70	.08	12
<i>Ovaa</i> visitation frequency ^a	77	0–4	2.39	1.07	.12	10
Religious participation with out-group ^a	77	0–4	.68	1.19	.14	10
Religious discussion with out-group ^a	78	0–5	1.76	1.36	.15	9
Omniscience scale	70	1–4	2.36	.97	.11	14

Note. *N* = number of participants who answered each question; *M* = mean; *SD* = standard deviation; *SE* = standard error; *NA* = number without response.

^a See CA+ supplement A4 for questions.

interaction term. Model 3 retains the variables of theoretical and statistical significance from model 1, including the interaction term, while model 4 is the same but removes the interaction.

Using corrected Akaike Information Criterion (AICc; Burnham, Anderson, and Huyvaert 2011) statistics, ΔAICc is the difference between the target model's AICc score and the smallest AICc score. The evidence ratio $\exp([\text{AICc}_x - \text{AICc}_{\text{min}}]/2)$ for the ΔAICc between model 1 and 2 is 7.61; model 1 is 7.61 times stronger at minimizing information loss than model 2. The evidence ratio between model 1 and 3 is 112.17, and models 1 and 4 have an evidence ratio of 4359.01. Given this extremely high ratio, the first two models better account for *ovaa* piety, though model 3 accounted for the greatest amount of variance (adjusted $R^2 = 0.35$).

Participant age and sex were consistently associated with self-reported frequency of cairn piety (with no crossed effects); the older participants are from the mean age, the more they report stopping at *ovaa*, and males claim to stop more often than females. The effect of age could be due to at least two possibly related factors. First, it may be indicative of a generational shift in traditional religious commitments. Second, this effect is consistent with other findings that religious commitments can vary with age by virtue of life-history factors; older people differentially allocate resources for religious purposes because of varying returns (Argue, Johnson, and White 1999; Shaver and Sosis 2014). Greater male frequency in cairn rituals is consistent with the aforementioned fact that collective rites are often male-only affairs. Note, too, that affiliation with shamanism predicts cairn piety frequency in models 1 and 3 while holding the interaction of shamanist affiliation and frequency of visits to shamans constant. Also, the more participants claimed that these spirits knew, the less they claimed to stop at *ovaa*. I return to this point below. In summary, what best predicts greater self-reported *ovaa* piety are commitment to shamanism, age, and being male, while increased attributed breadth of knowledge corresponds to a decreased self-reported frequency of stopping at cairns.

Representational Models of Gods' Minds

Turning now to Tyvans' models of morality and gods' concerns, figure 1 and table 5 detail the eight most salient items in the freelists for all four subdomains (see also CA+ supplements A1, A2). In figure 1, the magnitude of conceptual salience is indicated by the connection thickness between the domain (the center circle) and each listed item (the peripheral circles). The numerical values are Smith's *S* (salience) scores for each item, with dotted connections indicating $S < 0.10$. Values by the dotted brackets indicate the proportion of listed items that co-occur in the other domain, with values in parentheses indicating the mean salience of those items.

In order of descending salience, the eight most salient items in Tyvans' models of what it means to be a good person consisted of being (1) hardworking, (2) helpful, (3) kind, (4) modest, (5) respectful, (6) honest, (7) intelligent, and (8) having love for or strong ties to family members (84 respondents; $N_{\text{listed}} = 499$; $M_{\text{listed}} = 5.94$; $SD_{\text{listed}} = 2.43$). In terms of what constitutes a "bad Tyvan person," the most salient items listed were being (1) untrustworthy, (2) drunks or those who drink alcohol, (3) lazy, (4) envious, (5) greedy, (6) disrespectful, (7) cruel, and (8) ignorant (83 respondents; $N_{\text{listed}} = 483$; $M_{\text{listed}} = 5.82$; $SD_{\text{listed}} = 2.76$). In light of the relatively high homicide rate in Tyva, it is noteworthy that "murder" only occurred three times.

The most salient items listed for things that please spirit masters were (1) sanctification rituals, (2) offerings, (3) prayer, (4) not littering or polluting their areas, (5) believing in them, (6) sprinkling food, milk, or tea, (7) cleaning up their areas, and (8) reading invocations of various sorts (77 respondents; $N_{\text{listed}} = 259$; $M_{\text{listed}} = 3.36$; $SD_{\text{listed}} = 1.60$).⁵ What angers the spirits are (1) littering/polluting/sullyng the place, (2) not performing rituals, (3) drinking alcohol, (4) being greedy with resources, (5) not putting out fires, (6) defacing nature, (7) having bad thoughts or engaging in bad behavior, and (8) having no respect for family, the spirits, or ancestors (73 respondents;

5. These data include those reported in Purzycki (2011b).

Table 2. Pearson's correlation matrix of variables

	Urban index	Age	Number of children	Years formal education	Tyvan language fluency	Shaman visit frequency	Religiosity index	<i>Ovaa</i> visit frequency	Participation in others' religion	Discussion with others about religion	Omni-science scale	Moral items listed (angry)
Age	-.13*											
Number of children	-.05‡	.41*										
Years of formal education	.23†	-.03	-.14‡									
Tyvan language fluency	-.36**	.23†	.20‡	-.09								
Shaman visitation frequency	-.16‡	-.05	.30‡	-.27*	.17							
Religiosity index	.05	.15	.03	.03	.14	.11						
<i>Ovaa</i> visitation frequency	.08	.37‡	.13	.02	.26	-.00	.20					
Religious participation with out-group	-.02	.29‡	.26‡	.11	.03	.07	.34†	.19				
Religious discussion with out-group	.01	.17	.15	.12	.00	.11	.28	.18	.62***			
Omni-science scale	-.07	-.13‡	-.32*	.00	-.18‡	-.03	-.16‡	-.37*	-.18‡	-.18		
Frequency of moral items in the "anger" freelist	.26†	-.17†	-.23*	.27‡	-.45**	-.15‡	-.13	.27	-.07	.23	.30	
Frequency of moral items in the "please" freelist	.71***	-.47**	-.18†	.33†	-.42**	.00	-.14	.08	-.29†	-.09	-.03	.33*

‡ $P \leq .15$.

† $P \leq .10$.

* $P \leq .05$.

*** $P \leq .001$.

Table 3. How often do you stop at *ovaa*?

Response	N	Total (%)
I stop at every one	10	11.49
I stop at most of them, but not every one I pass	32	36.78
I stop half the time	15	17.24
I seldom stop at them	18	20.69
I don't stop at <i>ovaa</i>	2	2.30
No response	10	11.49
Total	87	100.00

Note. N = number who responded.

$N_{\text{listed}} = 257$; $M_{\text{listed}} = 3.52$; $SD_{\text{listed}} = 2.16$). As predicted, what pleases spirit masters largely consists of ritual behaviors, while what angers them is overexploitation and destruction of the natural resources in their domain. To what degree do these domains overlap?

As it turns out, there is notably little “religious” content in Tyvans’ models of morality and virtue. In terms of what constitutes a “good person,” only seven participants listed explicitly religious items in the “good Tyvan” domain: two listed “protective of nature,” and five listed things like “Buddhist,” “faithful in the threefold path of the Buddha, Dharma, and Sangha,” and “religious” as good. Additionally, three listed “protective of nature” as good qualities as well. In terms of what constitutes a “bad person,” two listed “not religious” as indicators of “bad Tyvans.” One said “not teaching Tyvan ways,” which might be construed as including religious traditions. Two indicated that a lack of a connection to nature is indicative of bad people. Only

one individual listed a religious item in both the good and bad lists (and this individual did *not* list moral items among the spirit masters’ concerns).

Overall, Tyvans listed 15 items (5.84%) among the things that please spirit masters that also co-occurred in the moral/virtue domain. These included bravery ($N = 2$), not using soap to clean yourself ($N = 1$), various qualities of “being good” or “not being bad” to others ($N = 3$), honesty ($N = 3$), honoring one’s homeland ($N = 1$), not fighting ($N = 1$), and passing down traditions ($N = 2$); and two mentioned not drinking alcohol. Among the things that anger or displease *cher eezi*, there were a total of 58 immoral items listed (22.47%). Twenty of these items (34%) consisted of alcohol use or abuse.

Figure 1 illustrates the contribution of overlap from each subdomain (see CA+ supplements A1, A2 for calculations). Recall that in table 2, the Pearson’s correlation of frequency

Table 4. Linear regression models accounting for reported frequency of *ovaa* piety

Predictor	Model 1	Model 2	Model 3	Model 4
Shamanist (1 = Shamanist)	.44 [.13, 1.75]*	.12 [−.37, .88]	.47 [.29, 1.71]**	.10 [−.32, .77]
Shaman visitation frequency	.28 [−.15, .93]	−.04 [−.48, .38]	.24 [−.04, .76]†	−.03 [−.37, .29]
Religiosity index	.02 [−.06, .06]	.02 [−.06, .07]	...	...
Religious discussion with out-group	.12 [−.10, .28]	.10 [−.13, .28]	...	...
Omniscience scale	−.26 [−.58, .01]†	−.16 [−.47, .13]	−.37 [−.67, −.17]**	−.26 [−.55, −.05]*
Age ^a	.44 [.01, .06]**	.42 [.01, .06]*	.40 [.01, .05]***	.36 [.01, .04]**
Sex (0 = female)	.37 [.17, 1.38]*	.31 [.01, 1.28]*	.28 [.12, 1.06]*	.21 [−.04, .94]†
Children	.04 [−.24, .30]	−.06 [−.33, .23]	...	...
Years of formal education ^a	.01 [−.06, .06]	−.09 [−.09, .04]	...	...
Birthplace (0 = rural; 1 = urban)	.01 [−.66, .72]	.13 [−.41, .99]	...	...
Urban index	.09 [−.70, 1.34]	.12 [−.68, 1.48]	...	...
Tyvan language fluency ^a	−.01 [−.32, .31]	.07 [−.25, .40]	...	...
Shamanist × shaman visit	−.66 [−1.92, −.21]*	...	−.61 [−1.75, −.38]**	...
Constant	−[.19, 3.73]*	−[.13, 3.89]*	−[2.15, 3.60]***	−[2.10, 3.64]***
Adjusted R ²	.27	.18	.35	.26
AICc	166.44	170.50	175.88	183.20
ΔAICc	...	4.06	9.44	16.76
N	54	54	65	65

Note. All models in the form β [lower, upper]; 95% confidence intervals in brackets. All models’ mean variance inflation factors were ≤ 2.01 .

^a Variables centered at mean.

‡ $P \leq .15$.

† $P \leq .10$.

* $P \leq .05$.

*** $P \leq .001$.

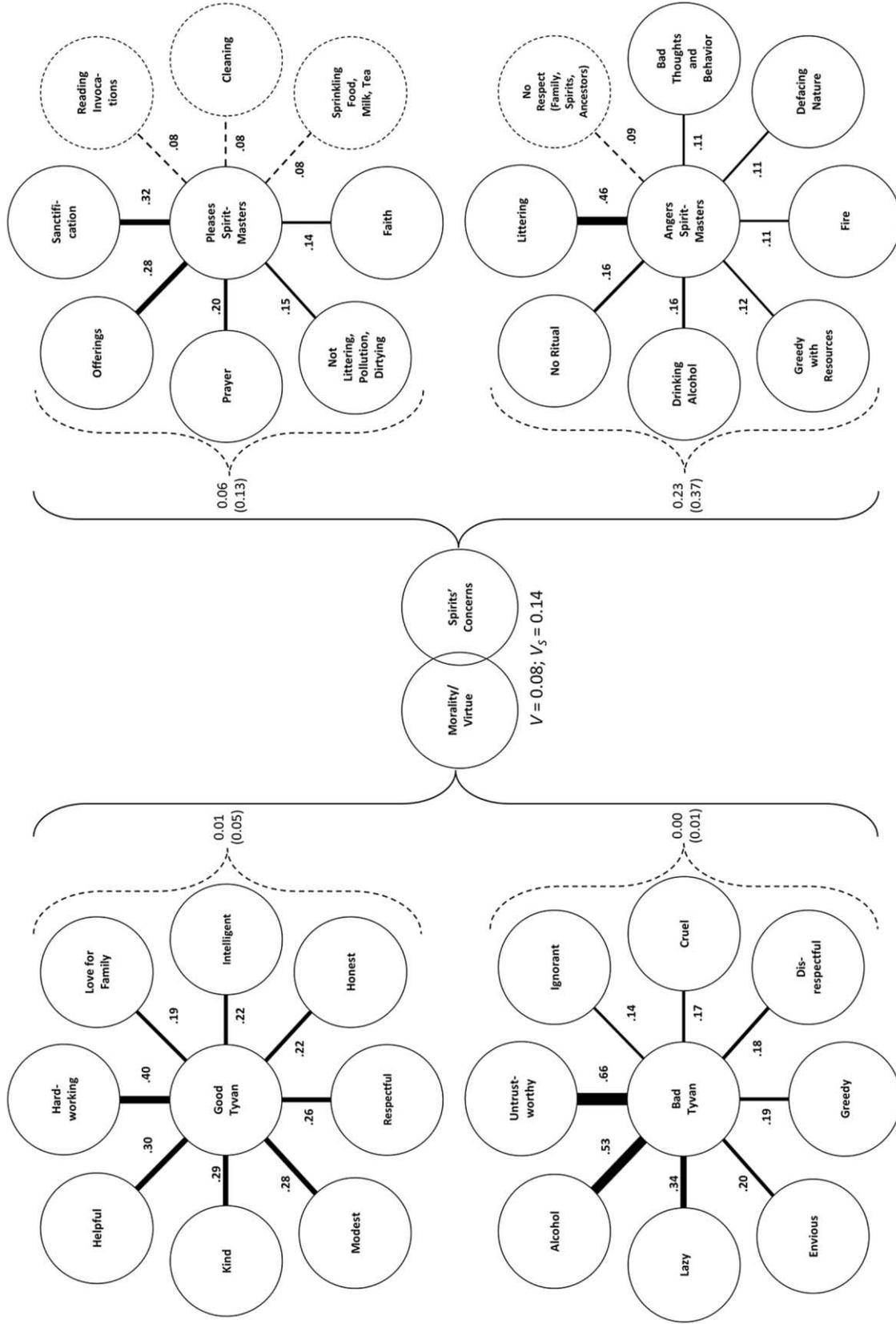


Figure 1. Eight most salient items in representational models of (counterclockwise from top left): (a) good Tyvans, (b) bad Tyvans, (c) what pleases spirit masters, and (d) what angers spirit masters. Connection weights are Smith's S scores for items, and dotted lines represent those with salience scores of ≤ 0.10 ; bracket values indicate proportion of cross-domain items listed in each subdomain with standard deviation in parentheses; V = overlap; V_S = salience of overlap.

Table 5. Descriptive statistics of eight most salient items per domain

Model and domain	Code	MS	SS	S	N	Frequency (%)	Total (%)
Models of morality/virtue:							
Good Tyvans	Hardworking	.60	33.75	.40	56	.19	.11
	Helpful	.64	25.12	.30	39	.13	.08
	Kind	.75	24.73	.29	33	.11	.07
	Modest	.66	23.59	.28	36	.12	.07
	Respectful	.57	22.08	.26	39	.13	.08
	Intelligent	.58	18.65	.22	32	.11	.06
	Honest	.67	18.16	.22	27	.09	.05
Bad Tyvans	Family	.49	16.18	.19	33	.11	.07
	Untrustworthy	.65	54.85	.66	84	.27	.17
	Drinking—alcohol	.83	43.80	.53	53	.17	.11
	Lazy	.59	27.85	.34	47	.15	.10
	Envious	.59	16.97	.20	29	.09	.06
	Greedy	.60	15.73	.19	26	.08	.05
	Disrespectful	.50	15.00	.18	30	.10	.06
	Cruel	.62	14.27	.17	23	.07	.05
	Ignorant	.58	11.56	.14	20	.06	.04
	Models of spirits' concerns:						
Please spirit masters	Sanctification of place	.63	23.78	.32	38	.24	.15
	Offerings	.52	21.28	.28	41	.25	.16
	Prayer	.67	14.81	.20	22	.14	.09
	No littering, polluting, dirtying	.72	11.46	.15	16	.10	.06
	Faith	.75	10.55	.14	14	.09	.05
	Sprinkle—food, milk, tea	.45	6.30	.08	14	.09	.05
	Cleaning	.77	6.18	.08	8	.05	.03
Anger spirit masters	Reading—invocations (<i>Iöree</i>), mantras	.73	5.80	.08	8	.05	.03
	Littering/polluting (water, <i>ovaa</i> , area)	.53	33.69	.46	64	.42	.25
	No ritual	.78	11.63	.16	15	.10	.06
	Drinking—alcohol	.58	11.58	.16	20	.13	.08
	Greedy with resources (berries, hunting)	.69	8.98	.12	13	.08	.05
	Fire	.72	7.94	.11	11	.07	.04
	Breaking/carving/cutting (branches/stones)	.71	7.79	.11	11	.07	.04
	Bad (thoughts, behavior)	.77	7.71	.11	10	.06	.04
No respect (family, spirits, ancestors)	.65	6.52	.09	10	.06	.04	

Note. MS = mean individual salience; SS = sum of salience; S = Smith's S; N = frequency; Frequency (%) = proportion of items listed by subdomain sample size; Total (%) = proportion of items listed by total items listed in subdomain.

moral/virtue items listed in the “pleases spirit masters” and “angers spirit masters” domains is 0.33 ($P \leq .05$). In other words, individual Tyvans are moderately consistent across subdomains in attributing moral concerns to these spirits.

Participants were more likely to list moral items ($M = 0.95$, $SD = 1.12$) among the things that spirit masters care about than list religious things ($M = 0.11$, $SD = 0.35$) among the things that constitute good and bad Tyvans (mean difference = -0.84 , 95% CI = $[-1.11, -0.57]$). Out of the 15 total moral items listed among the things that please spirit masters, the earliest listed items ($N = 12$) had a mean salience of 0.83 and a Smith's S of 0.13. Out of the 58 total moral items listed in the anger subdomain ($M_{\text{listed}} = 0.79$, $SD_{\text{listed}} = 0.94$), the earliest listed items ($N = 39$) had a mean salience of 0.69 ($SD = 0.24$). Smith's S for these items is 0.37. According to the more inclusive calculation (CA+ supplement A2), overlap (V) between these two domains is 0.08, and the S of these items (V_s) is 0.14. In summary, there is very little conceptual overlap be-

tween Tyvan models of morality and spirits' concerns; their attributed moral concern is negligible.

Explaining Spirit Masters' Moral Concerns

To account for the frequency of moral items listed in the spirits' concerns domain, I regressed the total moral items listed across both subdomains for each participant with the target variables. Table 6 reports models that account for variance in how many moral items Tyvans listed in the spirits' concerns freelist task (see CA+ supplement A3 for further analyses).

Model 2 (model 1 with the removed interaction term) has the lowest AICc score. According to the evidence ratio, it is 7.21 times stronger than model 1. Models 2–4 were backward-selected to retain those variables with the greatest effect. Model 2 is 2.11 times stronger than model 3 and 8.58 times stronger than model 4. Model 4 explains the greatest amount of variance (adjusted $R^2 = 0.19$).

Table 6. Linear regression models accounting for frequency of moral items attributed to spirit masters' concerns

Predictor	Model 1	Model 2	Model 3	Model 4
Shamanist (1 = shamanist)	.08 [-.80, 1.13]	-.01[-.66, .60]	...	...
Shaman visitation frequency	.43 [.09, 1.31]†	.33 [.00, .94]*	.26 [.03, .71]*	.25 [.03, .70]*
Religiosity index	-.01 [-.07, .06]	-.01 [-.07, .06]	...	...
<i>Ovaa</i> visitation frequency	.34 [-.04, .68]†	.38 [.01, .69]*	.30 [.02, .51]*	.24 [-.01, .45]†
Religious discussion with out-group	.24 [-.05, .38]‡	.23 [-.05, .37]‡	.25 [-.00, .34]†	.25 [.00, .33]*
Omniscience scale	.29 [-.06, .66]†	.34 [.04, .66]*	.06 [.04, .58]*	.33 [.09, .59]**
Age ^a	-.27 [-.05, .01]	-.29 [-.05, .01]‡	-.16 [-.03, .01]	...
Sex (0 = female)	-.07 [-.87, .59]	-.10 [-.88, .51]	...	...
Children	-.04 [-.32, .27]	-.06 [-.33, .24]	...	...
Years of formal education ^a	.22 [-.02, .12]	.20 [-.02, .11]	...	...
Birthplace (0 = rural; 1 = urban)	.03 [-.73, .88]	.07 [-.58, .90]	...	...
Urban index	.05 [-.97, 1.34]	.06 [-.92, 1.35]	...	...
Tuvan language fluency ^a	.13 [-.23, .50]	.16 [-.18, .50]	...	...
Shamanist × shaman visit	-.20 [-1.40, .81]	...	...	...
Constant	-[-3.40, .65]	-[-3.44, .53]‡	-[-2.40, -.22]*	-[-2.28, -.21]*
Adjusted R ²	.11	.13	.17	.19
AICc	165.64	161.69	163.18	165.99
ΔAICc	3.95	-	1.49	4.30
N	50	50	60	62

Note. All models in the form β [lower, upper]; 95% confidence intervals in brackets. All models' mean variance inflation factors were ≤ 2.01.

^a Variables centered at mean.

‡ P ≤ .15.

† P ≤ .10.

* P ≤ .05.

*** P ≤ .001.

Across all models, the strongest predictors of attributing moral concerns to spirits were (a) reported frequency of visits to shamans and *ovaa*, (b) regularity of religious discussions with religious out-group members, and (c) the breadth of spirits' attributed knowledge. The first two findings provide readily interpretable sources of transmission: discussions with shamans and—in all probability—Russian Christians reliably correlate with moralizing spirit masters' concerns. While this effect was not present in these models, as reported in table 2, there is a negative correlation between self-ratings of fluency in the Tyvan language and frequency of listing moral items for things that anger ($r = -0.45, P \leq .01$) and please ($r = -0.42, P \leq .01$) the spirits. If those who feel they speak Tyvan less well feel more comfortable speaking Russian, this negative correlation might be interpreted as an effect of Russianization. And again, the more Tyvans claim that spirits know is a predictor of how moralistic they think the spirits are. However, there was a slight negative, nonsignificant correlation with the omniscience scale and participation ($r = -0.18, P \leq .15$) or discussion ($r = -0.18, P > .15$) of religion with religious out-groups.

Note that the omniscience scale showed no strong interaction effect with any other variable. This lack of an interaction indicates that breadth of knowledge and explicitly claiming a god cares about morality is grounded in human cognition rather than cultural transmission (see Purzycki 2013 for the same effect using a different instrument). Recall that age predicted cairn piety. However, cairn piety and age show no interaction effects of claiming the spirits care about morality

or virtue. There were also no interaction effects between other variables and discussion of religion with out-group members that would indicate out-group influence (see CA+ supplement A3 for further analyses).

Discussion

In this report I sought to account for representational models of gods' minds in the Tyva Republic. By situating contemporary beliefs and practices in the social and ecological history of traditional Inner Asian religion, I first argued that the ritual cairn-spirit master system likely developed in response to maintaining territory, an acute problem for mobile populations. As supernatural agent cognition and ritual practices can function to minimize threats from others and contribute to prosocial behavior, placing rituals on borders may sanctify those territories. Indeed, according to the belief sets examined here, these spirits are primarily concerned with ritual and maintaining the vitality of the resources over which they lord.

Additionally, self-identifying as shamanist, being older, and being male predict greater cairn piety. Claiming spirits know more, however, predicts lower frequency of paying respects at *ovaa*. As also predicted, indices of new problems appear to filter into models of gods' concerns: some Tyvans claim that spirits care about human morality and virtue, particularly alcohol use and abuse. Factors involved in claiming the spirits care about morality included how often people visited shamans and ritual

cairns, the frequency of discussing religion with a religious out-group member, and how much participants claimed spirit masters know. While these factors may partly account for the source of participants' claims that the spirits care about morality, the content of that moral concern appears to conform to new conditions of urbanity and alcohol consumption.

Cher eezi are primarily concerned with ritual and with maintaining the vitality of their resource of mastery. The long-held association of spirit masters with ritual detailed above provides a partial explanation for this association. This, coupled with the fact that Tyvans trust people more if they engage regularly in cairn rituals located on territories (Purzycki and Arakchaa 2013), suggests that beliefs about gods' concerns are reliable indices of this particular religious system's operations: strategically located rituals on borders may indeed outsource the costs of maintaining respect for territory, just as associating a spirit with, for example, a natural spring may very well maintain the spring.

It is important to note, however, that even though Tyvans claim these gods care about rituals or overexploiting resources, this study is obviously no test of whether or not representational models actually motivate people or whether or not such a religious system solves the problems with which it is associated. There is evidence, however, that ritual functions to strengthen bonds and promote trust and that supernatural agency detection can decrease antisocial behavior. While Tyvans keep sacred places clean and engage in rituals to honor the spirits, the relationship between resource exploitation and beliefs about spirits' concerns requires further investigation (see Donahoe 2003). It is plausible however, that such appeals do curb excessive consumption and hunting, as there is evidence elsewhere that associating resources with spirits can alter the way in which people manage resources (see Atran et al. 2002; Berkes 2012; Bliege Bird et al. 2013; cf. Hames 1991, 2007; Smith and Wishnie 2000). As far as I am aware, a direct test of whether or not belief sets covary with preservation behaviors has yet to be conducted.

There are two primary lines of evidence that suggest that models of gods' concerns will coevolve with new problems. First, it is notable that almost a quarter of the sample listed alcohol use and abuse as things that anger spirit masters. While the seasonal distribution and consumption of fermented milk (*araga*) is often formalized, the introduction and availability of liquor and beer has undoubtedly contributed to widespread alcohol abuse and its related social ills. As religiosity can contribute to abstinence (Chitwood, Weiss, and Leukefeld 2008; Medicine 2007), appealing to the gods to curb abuse may be an effective starting point toward recovery, but formalized group support is likely also crucial. The fact that spirit masters point to this pervasive issue nevertheless lends support to the hypothesis that religion coevolves with social and ecological problems.

Second, concerns of littering and polluting also suggest that gods' concerns change in accordance with new problems. While one interviewee in a previous work emphatically denied

that spirit masters care about litter (Purzycki 2010:32), the present sample clearly emphasized that maintaining the vitality of the land and resources is central among the spirits' concerns. Presumably, before the introduction of litter, sacred places were to be kept free of pollution and resources maintained (recall that "defacing nature" had a Smith's *S* of 0.11). It is undoubtedly pragmatic to keep, for example, natural springs clean in order to maintain their utility. However, with the introduction of a market economy, consumables packaged in disposable materials, and a struggling infrastructure, waste management is an increased concern in Tyva, particularly in Kyzyl, the capital city. Indeed, during a recent trip, I saw televised public service announcements discouraging people from littering. As such, the meaning of keeping sacred spaces clean and vital also appears to be changing.

Curiously, while holding other variables constant, the more Tyvans said the spirits know, the more moral items they listed among spirits' concerns. To date, we have virtually nothing in the way of reliable cross-cultural data to assess what accounts for variation in gods' breadth of knowledge (see, however, Barrett, Richert, and Driesenga 2001; Lane, Wellman, and Evans 2012, 2014; Purzycki 2013a; Purzycki et al. 2012; Wigger, Paxson, and Ryan 2013). Perhaps gods' knowledge increases as a function of population density and social complexity; the more people interact with but cannot account for, the more gods know (Atkinson and Bourrat 2011; Norenzayan 2013), but we currently have no direct data to test this assertion. Table 2 indicated that the more participants' lives were spent in cities, the more they listed moral items in each of the subdomains of the spirits' concerns. This is consistent with the often found relationship between moralistic gods and social complexity and suggests that gods that care about interpersonal social behavior are useful devices to ensure proper conduct when there are far more anonymous and unaccountable people interacting. Yet, the urban index shows no correlation with the omniscience scale.

This report also offers a way to determine the degree to which people claim a deity cares about "morality." As previously discussed, a relatively long history of cross-cultural studies have focused on explaining "moralistic" deities. Yet to the best of my knowledge, this report is the first to critically examine what exactly this means by using data directly collected from people (cf. Purzycki 2011). If we take the "good" and the "bad" to be emic models of morality, then Tyvan models of morality barely overlap with what spirit masters care about. Again, targeted questions about whether or not these spirits know Tyvans' moral behavior is more likely to yield positive responses (Purzycki 2013), but this is clearly inconsistent with naturalistic, open-ended tasks. While Tyvan spirits may nevertheless contribute to upholding the moral order, they are not readily thought of as caring about it.

Exactly why models of gods' concerns consist of and change in accordance with specific pressing problems remains to be thoroughly understood. In part, gods concerned with indices of these problems might be easier to remember by virtue of

their interaction with evolved cognitive architecture and learning biases (see Atran 2002; Atran and Norenzayan, 2004; Barrett 2004, 2008a; Boyd and Richerson 1985:132–171; Boyer and Ramble 2001; Henrich and Gil-White 2001; Henrich and McElreath 2003; Purzycki and Willard, forthcoming; Richerson and Boyd 2005:58–98; Sperber 1996). However, these approaches are primarily interested in explaining transmission rather than explaining the content of that information with respect to social and ecological pressures, how individuals extract information related to these problems from the environment, and the constraints on domain inclusion.

Of particular relevance to cognitive approaches to religion may be a fitness-relevance memory bias (see Broesch, Barrett, and Henrich 2014; Nairne et al. 2009; Sandry et al. 2013; see also Henrich and Henrich 2010), but again, why some fitness-relevant things (e.g., alcohol abuse) over others (e.g., murder) become associated with gods' concerns remains an open question. In the present case, Tyvans might view alcohol as the source to most other social ills such as homicide, and this may be a more effective candidate to associate with gods. It is also possible that alcohol use and abuse are simply far more visible and therefore salient than homicide. In turn, this feeds into models of spirits' concerns.

The genesis of gods' concerns deserves serious consideration. In one example from Papua New Guinea, people competed to supernaturally explain a flood. Explanations ranged from retaliatory human sorcerers from an antagonistic neighboring group, members of the neighboring group claiming that planting crops on disputed land elicited sorcery, and some claimed that God was punishing them for not attending church as often as they should (Barker 2008: 122). What this suggests is that because others regularly show deference to spirits and supernatural forces, people claim the gods are concerned with otherwise new things for personal or collective ends. Sudden, synchronic episodes such as this may provide the impetus to use powerful deities to influence others in novel ways. Sustained, diachronic forces are likely what stabilize and aide the dissemination of conceptual associations with gods and socioecological problems (Purzycki and McNamara 2015).

While the work presented here found a correlation between thinking the gods care about morality and virtue and discussion of religion with undefined religious out-group members, it remains difficult to definitively speak to any directionality of influence. If we assume these out-group members are Christian Russians (or Christian Tyvans), it remains a question as to why such specific concerns would be “transferred” from *other* spirits from a different tradition. Nevertheless, what was a consistently better predictor was shaman visitation frequency, suggesting a top-down modification of spirits' concerns. If indeed such concerns are getting transmitted from shamans, why shamans appear to be attributing moral concerns to local spirits requires further investigation.

Recent works have employed novel analytical techniques with historical or ethnographic databases to track the source and emergence of moralistic deities (e.g., Botero et al. 2014;

Watts et al. 2015b). While this research has been and will continue to be invaluable, coming to better terms with the belief sets of living people will allow us to get a better sense of the otherwise unexplored variation that exists and to test directly whether or not religion evolves in accordance with the problems it appears to address. More importantly, it will also allow us to test whether or not it actually solves those problems.

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