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ABSTRACT

Current research suggests that commitment to moralistic, omniscient, and punitive gods may contribute to the evolution of cooperation. As they may curb antisocial behaviors that incur costly social repercussions, supernatural punishment may help stabilize reciprocal relationships among peers. One recent elaboration of this hypothesis posits that commitment to such gods may boost prosociality to the point that it expands cooperation beyond one's family and local community. Using three permutations of an experimental game designed to measure impartial fairness, the present study tests this hypothesis among Buddhists from the Tyva Republic. Contrary to the expanded sociality hypothesis, we found that key features of local spirits and Buddha systematically predict favoritism toward co-religionists from one's community rather than fairness toward co-religionists from distant towns. Moreover, important indicators of class – years of formal education, material insecurity, and fluency in the Tyvan language – also predict favoritism toward local Buddhists rather than geographically distant Buddhists. We used a Buddhist protection charm as a prime condition that showed no simple effects across games, but did interact with key religious variables. Importantly, when players had a stake in the game and played against anonymous, geographically distant Buddhists, if the experiment reminded them of the Buddhist temple or charity, they were fairer toward the distant co-religionist.

1. Introduction

Social life is fraught with problems that come in many forms. Among them are coordinating access to valuable resources, not knowing whom to trust, and the temptation to breach social norms in order to maximize one's own wellbeing. To varying degrees of intensity, threats to cooperation and coordination plague all human social organizations. However, people come to terms with these problems in a variety of ways (see Cronk & Leech, 2013; Smith, 2010), including religious beliefs and behaviors. These beliefs and behaviors can function as adaptive responses to various social and ecological problems (Purzycki & Sosis, 2013).[1]

Using a behavioral economic game designed to measure impartial fairness, the present work examines whether or not religion contributes to the maintenance of cooperation in the Tyva Republic. Below, we briefly review the primary literature on the evolution of cooperation and current views on how elements of religion can alter the social landscape. We then introduce a short political history of Buddhism in Inner Asia in order to situate the experimental study. Following this is a brief

overview of the methods we employed, a discussion of our primary hypotheses, followed by a report of our results. Finally, we conclude with a brief discussion of the study, and point to avenues of further inquiry.

1.1. Evolution of cooperation

The evolutionary literature on human cooperation generally predicts that at a cost to themselves, people are more likely to invest in kin (Hamilton, 1964), non-kin who will reliably reciprocate (Trivers, 1971), those who have good reputations (Alexander, 1987), and those who convey their cooperative intentions through costly behaviors (Zahavi, 1975). This is generally considered to be adaptive insofar as kin investment directly increases one's genetic fitness while partners in cooperation return benefits provided by stable cooperative relationships. As self-interest may lead to defection, cooperation is perpetually under threat and requires maintenance.

One relatively recently developed impediment to human cooperation and coordination is large community size; as populations of non-kin increase, monitoring and sanctioning antisocial behavior become more difficult (Richerson & Boyd, 1999; Turchin, 2013). While all individuals face the problem of whom to trust, larger, densely populated communities intensify this problem as individuals typically interact with far more anonymous others than familiars. Moreover, the exclusionary practices of various groups from different classes, racial, ethnic, and religious groups within more complex societies also modulate the breadth of individual sociality (Bowles & Gintis, 2004) and can often function as barriers to the kinds of social behavior we might expect from otherwise smaller-scale social units. In response, people have – with varying degrees of success – developed social institutions such as the police and courts that have specialized roles for countering, steering, maintaining, and/or exacerbating costly social problems. While researchers have examined many factors addressing challenges to cooperation, religion's contribution to the evolution of cooperation has become increasingly apparent in rececent years.

1.2. Religion's contribution to cooperation

Some have found that in a variety of ways, religion contributes to strengthening cooperative relationships that may enhance individual genetic fitness. By stabilizing cooperation and norm compliance, both beliefs (Bering, McLeod, & Shackelford, 2005) and ritual behaviors (Sosis & Bressler, 2003; Sosis & Ruffle, 2003) can function to increase the chances of individual survival and reproduction. In terms of beliefs, god concepts can proximately function as cost-effective, psychologically salient motivators and appeals that may inhibit self-interested behavior because they tap into moral cognition (Purzycki, 2013a; Purzycki et al., 2012), mind-perception and the feeling of being watched (Atkinson & Bourrat, 2011; Gervais & Norenzayan, 2012; Piazza, Bering, & Ingram, 2011), and risk aversion through supernatural sanctions (Johnson & Krüger, 2004). Such mechanisms can alter the course of social behavior and evidence continues to mount suggesting that by harnessing these psychological systems, supernatural sanctions can, in fact, reduce antisocial behavior that could otherwise benefit actors (McKay, Efferson, Whitehouse, & Fehr, 2011; Rand et al., 2014; Shariff & Norenzayan, 2011; see Purzycki et al., this volume, for further discussion).

One thread in this literature – the "supernatural punishment hypothesis" – predicts that commitment to punitive gods can contribute to human sociality in crucial ways (Johnson & Krüger, 2004). Schloss and Murray (2011) delineate between two main varieties of the supernatural punishment hypothesis. One frames supernatural punishment as an adaptive response to secular punishments; commitment to supernatural deities curbs behaviors that elicit costly community responses. Appeals to gods harness the aforementioned psychological systems involved in social interaction and may alter perceptions of the probability of being watched or punished. In turn, such appeals alter the perceived payoffs for defecting on social obligations (Johnson, 2005, 2015). As cooperation increases the chances that individuals survive and reproduce, these components of religion may contribute to

individual fitness by reducing the costs of monitoring and maintaining social ties. The aforementioned experimental studies suggest that, at the very least, exposure to supernatural agent concepts can, in fact, modulate social behavior and rule following.

But just how far do these effects extend? Especially in light of the aforementioned threats that widening social networks pose, can supernatural punishment maintain its influence? Can it increase the *probability* of cooperative behavior beyond parochial religious ingroup boundaries? The second version of the supernatural punishment hypothesis emphasizes the enhancement of cooperation in order to help explain the aforementioned problem of too many people (Norenzayan, 2013; Purzycki et al., this volume).[2] Because increased human social complexity poses difficulties for standard evolutionary explanations for cooperation (e.g., kin selection, reputation management, emotions), punitive, knowledgeable, and morally concerned deities may have been culturally selected because of the prosocial benefits that others provide. In other words, individuals are more likely to adopt beliefs in such deities because they induce others to cooperate, regardless of whether or not they are likely to reciprocate in the future. These prosocial effects, it is argued, may have contributed to increasing social complexity and therefore making such traditions more culturally successful by virtue of conversion and conquest (Norenzayan et al., 2016).

Assuming that under similar conditions, people on average are more likely to bend rules in order to favor themselves over their local community, and members of their community over those in other groups not likely to ever reciprocate, the supernatural punishment hypothesis would generally predict an association between commitment to punitive deities and the reduction of self-interested favoritism. However, if gods' punishment, knowledge, and moral concern have an effect that increases prosocial behavior beyond one's own community, then people ought to behave more equitably toward others they aren't likely to know.

We examined these hypotheses among Buddhists in the Tyva Republic of southern Siberia. Using a religious object prime as a treatment condition to detect any causal relationship between religious symbolism and cooperation, we relied on an experimental game that measures systematic rule bending in economic gameplay. If religious symbolism has an effect on the reduction of self-interested behavior due to its alleged association with regulating social behavior, participants exposed to such symbols ought to play more fairly in this experiment than a control group. We also assessed participants' beliefs about two locally salient gods – Buddha and local "spirit-masters" – and a host of demographic variables, as well as data from participants' reflections on the game, to examine their effects on economic behavior. We first briefly detail some history of Buddhism in the area, followed by a discussion situating current beliefs and practices in a context of post-Soviet cultural revitalization. We then present the experiment, its results, and conclude with a discussion of those results.

2. Religion in the Tyva Republic

The Tyva Republic (Tyva, or popularly known as "Tuva") lies between the Sayan and Tangdy-Uula (Tannu-Ola) mountain ranges just north of western Mongolia. Populated by a Tyvan ethnic majority of 82% (249,299[3]), Tyva is roughly split between urban and rural residents. Rural Tyva hosts herders of reindeer in the north-east, and of sheep, goats, cattle, and yaks in the rest of the republic. Rural inhabitants live in small villages and/or yurt encampments, moving up to four times per year. Urban Tyvans – those who live in the capital city of Kyzyl or the western asbestos mining town of Ak Dovurak – predominantly engage in a market economy. Tyva is currently undergoing a cultural renaissance and is now globally recognized for its throat-singing (*xöömei*) tradition (Levin & Süzükei, 2006; Süzükei, 2007). Harrison (2000) characterizes Tyvan literacy rates as "near universal" (p. 10), and Tyvans' literacy rates in the Russian language are documented at 85%.[4] In 2002, 99.6% of Tyvans claimed Tyvan as their native language (Chevalier, 2010), and overall literacy rates for the Tyvan language can be confidently assumed to be quite high as well.

2.1. A brief political history of Buddhism in Inner Asia

While researchers (e.g., Khomushku, 2008; Vainshtein, 1980, p. 32) often cite it as having been introduced during the Manchu (Qing) Dynasty (1644 to 1912), Tibetan Buddhism's first wave into Inner Asia was considerably earlier. Indeed, there are many indications that it began its fixture on the Silk Road quite early (Foltz, 1999, pp. 37–58). According to Zürcher (2007), the earliest indication of a Buddhist influence in China dates to 65 CE. The beginning of nearly two centuries of Türkic rule (552–734 CE) is marked with one of the earliest of a few major waves of Buddhist influence in Inner Asia. While this period began Muhan-Khagan's reign in 553, the tradition flourished after the marriage of his daughter to Wu-ti, the Chou emperor, in 568. Drawing from Chinese sources, Klimkeit (1990) discusses the erection of a "Turkish Temple" in Ch'ang-an that was "built for the 'Great [Khagan] of the Turks', i.e., Mu-han" (p. 55). While Christian (1998) suggests that Muhan's "brother and successor, T'o-po … was attracted by Buddhism, the favored religion of the Ch'i" from the eastern Wei Dynasty (p. 251), Klimkeit (1990) states that while T'o-po erected a Buddhist temple and asked for scriptures from another leader, whether or not he fully became Buddhist is unknown (p. 55).

When the Manchus defeated Ligdan Khan in 1634, they gained control of the regions formerly controlled by the Mongols, and took up the mantle of the "'patron' of Lamaism" (Heissig, 1980, p. 32). The Ch'ing were regularly involved in Tibetan politics because of the already-established influence of Buddhism among the Mongols. Importantly, Buddhism was a universalizable religion that transcended kin ties, thus allowing more groups to come under the fold of its influence (Barfield, 1992, p. 284). The years of the Manchu Dynasty were replete with significant political and economic changes. Tyva was then considered "Uryankhai Territory" and soon came under the control of Chinese lords (see Ewing, 1981 for further discussion).

These lords divided Tyva into distinct administrative territories (*kozhuun*[5]) run by administrators known as *noyon* (Dougherty, 1977; Ewing, 1981). The *kozhuun* district system remains intact to this day (there are now 17). The *noyon* extracted dues from the resident nomads and thus accumulated large herds for themselves (Dougherty, 1977, p. 26) and forcefully moved people to better facilitate their management (Ewing, 1981). With this newly formalized division of the territory, new roles were instituted for the lords of regions with a notably complex bureaucracy (Potapov, 1977, p. 43). Of course, local lamaseries also extracted donations from the public, costs for "construction and upkeep of the khoshun [*sic*] monasteries and for religious services … forc[ing locals] to supply workers (medee) to farm at the monasteries" (p. 45).[6] Local Buddhist temples (*khüree*) in Tyva were initially constructed in the 1770s (D'iakonova, 2001).

While briefly "independent" between 1921 and 1944 (Alatalu, 1992), Russia's influence was ever-present and continues to maintain deep involvement with Tyva. Under terms that vary according to source, Tyva officially became the "Tuvan Autonomous Region of the Soviet Union" in 1944. During Soviet rule, religious practices were banned, religious leaders were executed, and lamaseries were destroyed (Mänchen-Helfen, 1992 [1931]). According to Reid (2002), "In 1931, a census put the number of practising shamans in Tuva at 725. By the end of the decade, in public at least, there were none left" (p. 107). Salchak Toka became the General Secretary of the Tuvan People's Revolutionary Party in 1932 and climbed the local political ladder by continuing campaigns against religious leaders and increasing the pace of collectivization. In 1937, Soviets destroyed Tyva's center of Buddhism, the Üstüü Khüree temple (see Figures S4a, b in the online supplementary material).

2.2. Contemporary religion in Tyva

With the Soviet system now behind them, the traditions of the Buddhist Russian republics face little federal resistance (see Holland, 2012, 2014a, 2014b). In 1992, the Dalai Lama visited Tyva and sanctified a sacred mountain (Xaiyrakan) and the new Tyvan flag. There have also been recent efforts to promote religious literacy with the publication of Buddhist dictionaries and key texts in Tyvan (e.g., Kuular, 2010; Serenot, 2010). The Üstüü Khüree temple has been rebuilt, in part due to the

Üstüü Khüree Festival, an annual music festival devoted to raising money for the effort. This temple serves a nearby lamasery dedicated to Buddhist instruction. In the capital city of Kyzyl, Buddhist symbolism is ubiquitous. The Sanskrit mantra *Om Mani Padme Hum* (in Tibetan script) graces the side of Dögee Mountain, just north of Kyzyl, for all to see (see Figure S4d) and the city center hosts a large prayer wheel. There is in all probability a very strong divide between the influence of Buddhism in Kyzyl and the rural areas.

Of the two official religions of Tyva – Buddhism and Shamanism – most Tyvans self-identify as Buddhist. According to a Federation-wide Russian religious census in 2012,[7] 61.8% of Tyvans self-identify as Buddhist while 8% consider themselves traditional (i.e., "the traditional religion of [their] ancestors [and] worship the gods and forces of nature"). However, among ethnic Tyvans, the divide between Buddhism and traditionalism in the Republic is quite porous in both practice and beliefs (see Lehmann, 1998; Zhukovskaia, 2001a, 2001b).

Buddhism in Tyva overwhelmingly lies within the Tibetan Gelugpa (Yellow Hat) school of Buddhist thought. However, many Tyvans – if not the majority – view Buddha as a god-like agent and many refer to him as *Buddha Burgan* (literally "Buddha god"). Preliminary ethnographic surveys (Purzycki, n.d.) show that Buddha is the most salient and frequently freely-listed deity among Tyvans. Moreover, when asked to freely list what Buddha likes and dislikes, the majority of Tyvans will list moral behaviors and virtue as distinct from 10 other domains (e.g., as ritual, ecological practices, and etiquette; see Purzycki & McNamara, 2016; Purzycki et al., 2016).[8]

While the mythology and shamanic pantheon of Tyva is full of various gods and spirits (see Kenin-Lopsan, 1992, 1997; Oelschlägel, 2013; Samdan, 2004), of particular significance throughout Inner Asia is the local spirit-master. These local spirits (*cher eezi*, lit. "master of the place") correspond to territories, regions, and natural resources (Purzycki, 2013a). Among herders throughout Inner Asia, upon crossing into someone else's herding territory, one stops and pays respects to local spirits for safe passage at ritual cairns (*ovaa*). These cairns are typically located on territorial borders as well as borders between *kozhuun* (Bawden, 1958; Halemba, 2006; Kuzhuget, 2002, 2003; Vreeland, 1953). *Cher eezi* are relatively non-moralistic gods that are neither as knowledgeable nor as punitive as the Abrahamic god (Purzycki, 2011, 2013b). Rather, they are thought to be primarily concerned with resource vitality and ritual behaviors (Purzycki, 2011, 2016). These rituals reliably convey trustworthiness to observers (Purzycki & Arakchaa, 2013) and typically take place in transit and during annual family- and territory-wide rituals held during the spring months. Buddhist stupas (*suburgan* in Tyvan) often stand next to roadside *ovaa* (Figure S4c). Lamas often perform shamanic rites and devout Buddhists regularly participate in rituals that outsiders otherwise might see as "traditional" or "non-Buddhist." Given the significance of these two intertwined traditions, we tested for the effects that *Buddha Burgan* and spirit-masters may have on the breadth of fair behavior.

3. Methods

3.1. Experimental games and hypotheses

Designed to experimentally assess impartial rule following, the Random Allocation Game measures overall, systematic favoritism through rule breaking (Fischbacher & Föllmi-Heusi, 2013; Hruschka et al., 2014; Jiang, 2013; McNamara, Norenzayan, & Henrich, 2016; Purzycki et al., 2016). Using a stack of coins, a two-colored die, and two cups reserved for specific people, players are supposed to pick a cup, roll the die, and allow the die to determine where to put a coin. If the die comes up one color, players are *supposed* to put the coin into the cup they thought of, whereas if the die comes up another color, participants are *supposed* to put the coin into the opposite cup to the one they thought of. If participants play by the rules, coins should be roughly evenly allocated and overall allocations should follow a binomial distribution. However, since participants play by themselves with no monitoring, they can purposely cheat or accidentally bias allocations. Overall

allocations systematically deviating from a binomial distribution suggest impartial favoritism (see Purzycki et al., this volume and 2016 for methodological details).

All participants played three games with 30 ten-ruble coins for each game. Dice were white with three sides dotted with black nail polish (see Figure 1). We tested the dice for fairness prior to administration and all dice were fair. In one game (the *Local Co-Religionist Game*), participants were supposed to allocate coins between an anonymous, randomly selected Buddhist from Kyzyl (LOCAL) and an anonymous Buddhist from Ak Dovurak (DISTANT). Note that there is no formal Buddhist temple in the main area of Ak Dovurak, but there is a lamasery and temple nearby. In the *Self Game*, participants allocated coins between themselves (SELF) and another anonymous Buddhist from Ak Dovurak. In the *Individualist Game*, players allocated coins between SELF and another LOCAL. After finishing all experiments, we put allocations for LOCALs and DISTANTs in separate envelopes. We subsequently gave the earnings to randomly selected Buddhists around Kyzyl and at a café in Ak Dovurak.

Using these games and a variety of other measures, we tested the following hypotheses:

H_1. Raw allocations in cups should generally follow a pattern of ego-based favoritism: SELF > LOCAL > DISTANT.

H_2. If supernatural agents' punishment, moral concern, and knowledge breadth contribute to *parochial* cooperation, then the more Tyvans claim the gods know, punish, and care about morality, the greater the odds that coins go into LOCAL cups.

Figure 1. Game setup with prime (*kamgalal*).

H₃. If such deities expand prosociality beyond ingroups, then the more Tyvans consider their deities to be moralistic, punitive, and knowledgeable, the more coins should go into the DISTANT cups.

H₄. If the effects of H₃ are causal, players who make play in the presence of a religious prime associated with moralistic, punitive, and knowledgeable gods should allocate more coins to the more distant cups than those in a control group.

3.2. Variables

After participants completed games, we asked a battery of demographic, economic, religiosity, and intergroup relations questions (see Purzycki et al., current volume and 2016).[9] Focal demographic questions included: age, sex, number of children, a scale measuring self-reports of fluency in the Tyvan language, and total years of formal education.

Our religiosity questions included a religious commitment scale, as well as questions about deities' knowledge, punishment, and rewards. Our religious commitment measures are two composite means of three-item scales. We asked the following three questions about *Buddha Burgan* and *cher eezi*: (1) *How often do you think about* [the target deity]? (2) *How often do you worry about what* [the target deity] *thinks about you?* and (3) *How often do you perform rituals devoted to* [the deity]? Options were on a visual five-point frequency scale: (4) Every day or multiple times per day; (3) A few times per week; (2) A few times per month; (1) A few times per year; and (0) Very rarely/never.

The three questions pertaining to Buddha ($M = 2.30$, $SD = 1.15$) had high intercorrelations (Cronbach's $\alpha = 0.77$, 95% CI = [0.56, 0.97]) which only dropped if we omitted any variable. The religiosity questions for spirit-masters ($M = 1.49$, $SD = 1.11$) also had high intercorrelations (Cronbach's $\alpha = 0.81$, 95% CI = [0.62, 1.00]). As these were reliable scales, we converted them to two mean scores for each participant. We include these two variables as controls in our regressions. Note that while both of these mean scores were correlated (Pearson's $r = 0.50$, $p \leq 0.001$), participants rated their religious devotion as much higher toward Buddha than to spirit-masters ($V = 2220$, $p \leq 0.001$). Note, too, that despite this correlation, they did not detectably contribute to variance inflation in diagnostic analyses in any of the regressions we performed.

We measured gods' punishment using the mean of two dichotomous questions: (1) *Does … ever punish people for their behavior?* and (2) *Can … influence what happens to people after they die?* Gods' breadth of knowledge was measured using the mean of two other dichotomous questions: (1) *Can … see into people's hearts or know their thoughts and feelings?* and (2) *Can … see what people are doing if they are far away in Moscow?* We asked about gods' reward frequency as well: *How often does … assist people in their lives or reward them for proper behavior?* on the aforementioned frequency scale.

We also measured a host of variables measuring subjective feelings of intergroup relations. If, for instance, some individuals felt hostile toward distant co-religionists in Ak Dovurak, we wanted to ensure that such variation was accounted for in our analyses. Using a visual fusion scale (Swann, Gómez, Conor, Francisco, & Huici, 2009), we asked: *Using these pictures, how emotionally close do you feel toward …* (1) *Buddhists from Ak Dovurak?*; (2) *Buddhists from Kyzyl?*; and (3) *Russian Christians from Ak Dovurak?* These scales were represented as increasingly overlapping circles and ranged from 1 = completely separate, denoted by two circles that were not overlapping, to 4 = completely part of, represented by one circle within another circle (see note 9).

Participants also evaluated their perceived religious similarity between their own community and that of Buddhists in Ak Dovurak: *How similar are the traditions/religious beliefs and practices of Buddhist Tyvans in Ak Dovurak with Buddhist Tyvans in Kyzyl?* Participants answered on another visual scale from −2 (very different) to 2 (very similar). Participants pointed to the most accurate description of the way they felt in regard to other players.

As mentioned above, effective secular institutions may also function to promote cooperation. Indeed, previous studies measuring unfairness in experimental economic games found this to be

the case (Hruschka et al., 2014; McNamara et al., 2016). We therefore asked participants to rate the police using the following question: *Most members of the police are …* Options were: −2 (very bad), −1 (bad), 0 (neither good nor bad), 1 (good), and 2 (very good).

3.3. Analyses

We ran all regressions in the binomial family of regressions using R software (R Core Team, 2012). We used the car (Fox & Weisberg, 2011), gmodels (Warnes, Bolker, Lumley, & Johnson, 2015), and psych (Revelle, 2015) packages as well as the *LogisticPseudoR2s* function (Field, Miles, & Field, 2012, p. 334) in our analyses.

Target cups in models were the most distant cup from participants (i.e., LOCAL when the other cup was for participants, or DISTANT in the other games). We also included game order as a factor in all full models.

Models were backward-selected from full models to retain those variables with the largest effects. As our sample size was low, we determined the best models by comparing corrected Akaike Information Criterion scores (Burnham, Anderson, & Huyvaert, 2011). Note that in addition to suffering from other problems (see Whittingham, Stephens, Bradbury, & Freckleton, 2006), while backward selection is known to yield false positives for significance tests (Mundry & Nunn, 2009), our reported results are not qualitatively different between full and optimal models (i.e., those variables with the largest impact maintain 95% confidence intervals that do not cross or just barely cross the log odds ratio of 1.00). While we emphasize odds ratios and confidence intervals, we also report *p*-values (≤ 0.15) primarily for the sake of comparison with these caveats in mind.

3.4. Sampling, locations, and execution

Organizing follow-up sessions proved to be very difficult, in part due to the higher rates of transience during the summer months; people often visit the countryside for extended periods of time and many participants could not commit to follow-up interviews. As such, we decided to conduct experimental and religiosity measures in single sessions that lasted up to 90 minutes. In order to minimize the chances of collusion, we had four assistants help recruit people and coordinate a meeting time. These assistants did not divulge any information about the study other than that we required up to 90 minutes of participants' time and that they would be compensated for it.

In accordance with the protocols (see Purzycki et al., this volume and 2016), all participants played games first and were interviewed upon completion of the games. We encouraged enlisted participants to also recruit more people before their participation, but not after, and we turned down all offers to help recruit more people from all participants who had completed the study. All unscheduled individuals were turned away due to the high chances of collusion with other participants. Assistants also asked each participant about all of the information that they knew about the study. Everyone conveyed only the allowed information. Assistants recruited Buddhist and/or Shamanist Tyvans who could speak Tyvan well.

As our repeated attempts to procure research space at the local university were never followed up, we conducted experiments in three locations: Kulundary's apartment (*n* = 63), Purzycki's apartment (*n* = 12), and at a participant's home in eastern Kyzyl (Kaa-Khem; *n* = 7). We conducted experiments and collected demographic data in an isolated room while post-experimental interviews were conducted in the kitchens. At homes, participants played on a couch (Figure 1) while participants in Purzycki's apartment played at a desk. The game settings were set up to ensure that no indications of Buddhism or agency of any sort (e.g., photos, statues, etc.) were immediately present in the purview of players other than the prime in the treatment condition (see below).

Those waiting for their turn waited in the foyer, the hallway, or outside. Assistants were present in each location to ensure that no one talked about experiments and that the flow of participants was tightly controlled. Upon completion of the session, participants were paid their game winnings and

show-up fee, signed receipts, and were free to leave. We requested that they not speak with anyone about the details of the game. And again, if people asked whether or not they could recommend more people, we declined the offer.

Upon entering the game area, we randomly selected a unique ID card out of a regularly shuffled deck for participants. These prefabricated ID cards had: (a) ID numbers, (b) a randomly assigned game order code, (c) a randomly assigned Buddha or spirit-master survey order code, (d) a treatment assignment (see next section), and (e) Purzycki's contact information. We held onto the cards throughout the experiment and interview process to keep track of this information and adapt our execution strategy accordingly. When participants were finished with their gaming session, we gave them their ID cards to hold onto until finished with the post-experimental interviews. They returned to the game area when it was available, showed Purzycki their ID card, were paid their earnings, signed receipts, and given their ID card. We placed the cups in the assigned order onto a tray, which we turned in between games without touching the cups. We asked test questions for the first two games people played, but not the third.

3.5. Prime and materials

In experimental settings measuring economic behavior toward other people, psychological primes can tap into pools of information, motivations, and corollary modes and scripts that affect sociality (Aveyard, 2014; Hadnes & Schumacher, 2012; McKay et al., 2011; Rand et al., 2014; Randolph-Seng & Nielsen, 2007; Shariff & Norenzayan, 2011). Additionally, in the case of cross-cultural economic experiments, framing effects are important factors in game outcome; researchers can frame experimental games in ways that tap into locally salient institutions that can have considerable effects on economic decision making (Cronk, 2007; Gerkey, 2013; Liberman, Samuels, & Ross, 2004). While such effects can be induced as in the case of priming or with framing effects, what participants bring to the experimental table, so to speak, can be just as important if it can explain significant variation in behavior. In the present work, we used both a physical object prime and also asked a series of post-experimental questions to account for how participants framed the experiment.

In our experimental condition, we used a Buddhist charm (*kamgalal*) (Figure 1), which we purchased at the main temple (*khüree*) in Kyzyl. There was notably very little variation in how participants viewed the charm; Tyvans typically use them for protection of self, of personal property, and they often hang them from the rearview mirrors of vehicles or over doorways for safety and security. Many participants also claimed it attracts wealth and good luck, while others claimed it wards off evil spirits. As such, it may actually *boost* self and local favoritism by virtue of its believed properties of protection and wealth generation. Its design represents the Dharma wheel (*dharmachakra*), a ubiquitous symbol of Buddhism. Dharma, or *dhamma*, is as important as it is vague in Buddhism. It typically refers to "law, a moral law, a spiritual law of righteousness, the eternal law of the Universe, Truth" (Mascaró, 1973, p. 9; see also De Bary, 1969, p. 9). More specifically, it can refer to the general doctrine of the Buddha such as the "Four Noble Truths" and the "Eightfold Path."[10] However, "[i]t [also] includes not only the conditioned things and states, but also the non-conditioned, the Absolute, Nirvāṇa" (Rahula, 1974, pp. 55–56). Knowing that the *kamgalal* was well understood as a Buddhist symbol, we placed it before the tray for each treatment condition. The control group played without the charm.

According to the Russian Department of Federal State Statistics Service, as of March 2012, the average monthly salary in Tyva was 16,913 rubles (~850 RUB per diem).[11] The show-up fee was 150 rubles (~\$4.23 US). Each roll was worth 10 rubles (~\$0.28 US) for a total of 300 rubles per game for a total of 900 (~\$25.38 US) in-play rubles. This roughly corresponded to the average per diem wage.

All materials were translated and back-translated from Tyvan and Russian in the event of difficulty. While we actively recruited Tyvans who spoke Tyvan well and most of our participants rated their Tyvan as quite good ($M = 3.07$, $SD = 0.85$), four individuals (5% of the sample) rated their

Tyvan as "not very good," but only one found it easier when we read part of the instructions of the game in Russian (all interviews were in Tyvan, however).

3.6. Participants

While some were mildly confused by the instructions, all participants passed the initial test questions. While one individual consistently passed the test questions, we subsequently deleted him from the sample as he allocated coins to cups that were not in play. Table 1 details the basic demographics for the remaining participants by condition.

When asked if *Buddha Burgan* punishes people for their behavior, 58 (71.6%) of the present sample responded "yes," 21 (25.9%) responded "no," and 2 (2.5%) did not answer. Yet among those who responded that Buddha punishes people, the six-item Deity Moral Concern Scale (see Purzycki et al., this volume for specifications) remained lower than that found among the Abrahamic traditions in this volume ($M_{Grand} = 2.92$, $SD_{Grand} = 1.26$; $\alpha = 0.84$; see Cohen, Baimel, and Purzycki, this volume; McNamara and Henrich, this volume; Atkinson, this volume).

In terms of Buddha's ability to see into people's hearts and know their feelings, 66 (81.5%) affirmed this while 12 (14.8%) denied his ability to do this (three did not answer). A total of 74.1% of the sample ($n = 60$) reported that Buddha influences what happens when people die, whereas 24.7% denied this (one did not answer). A total of 60.5% of the sample ($n = 49$) responded that Buddha "assists people in their lives or rewards them for proper behavior" every day or multiple times per day.[12] One of our interviewees resisted the framing of such questions on the grounds that the Buddha was a person who lived centuries ago, and was not a spiritual agent.

4. Results

4.1. General results

After the experiments, we asked participants what the game reminded them of. This data allowed for *post hoc* coding of any self-induced framing effects. In the present sample, responses ranged from charity, helping others, and the charity box at the Buddhist temple (*khüree*) to gambling, games, and other miscellaneous items. While two people mentioned both games and generosity of some sort, there was a striking divergence between those who mentioned charity and elements of

Table 1. Means and (standard deviations) for demographic, religiosity, and social relations variables. See Purzycki et al., 2016 and this volume for variable details.

	N	Female	Age	No. of Children	Native Language	Formal Yrs. Ed.	Material Security	Material Confidence
Control	42	32	33.21 (12.27)	1.86 (1.44)	3.14 (0.75)	15.69 (2.05)	0.48 (0.29)	1.41 (0.45)
Treatment	39	26	33.87 (12.94)	1.54 (1.41)	3.00 (0.95)	15.17 (2.52)	0.45 (0.26)	1.41 (0.47)
Total	81	58	33.53 (12.52)	1.70 (1.43)	3.07 (0.85)	15.44 (2.29)	0.47 (0.28)	1.41 (0.46)
	Punish (Buddha)	Know. (Buddha)	Reward (Buddha)	Punish (Cher eezi)	Know. (Cher eezi)	Reward (Cher eezi)	Religiosity (Buddha)	Religiosity (Cher eezi)
Control	0.75 (0.32)	0.79 (0.37)	2.85 (1.55)	0.79 (0.32)	0.73 (0.35)	2.36 (1.56)	2.39 (1.14)	1.70 (1.15)
Treatment	0.72 (0.34)	0.93 (0.21)	3.00 (1.45)	0.69 (0.30)	0.85 (0.31)	2.41 (1.50)	2.21 (1.17)	1.26 (1.04)
Total	0.73 (0.33)	0.86 (0.31)	2.92 (1.49)	0.74 (0.31)	0.78 (0.33)	2.38 (1.52)	2.30 (1.15)	1.49 (1.11)
	Police Eval.	Emotional Closeness to LOCAL	Emotional Closeness to OUTGROUP	Emotional Closeness to DISTANT	Religious Similarity to DISTANT	DISTANT (Local Co-Religionist Game)	DISTANT (Self Game)	LOCAL (Individualist Game)
Control	0.39 (0.70)	3.81 (1.38)	2.29 (1.53)	3.02 (1.73)	1.15 (0.83)	14.21 (2.59)	15.52 (2.98)	15.29 (2.55)
Treatment	0.43 (0.55)	3.71 (1.56)	2.16 (1.44)	2.95 (1.69)	1.22 (0.42)	14.87 (2.35)	15.05 (2.94)	15.18 (3.24)
Total	0.41 (0.63)	3.76 (1.46)	2.23 (1.48)	2.99 (1.70)	1.18 (0.66)	14.53 (2.49)	15.30 (2.95)	15.23 (2.88)

For number of children, one individual answered "three," but seven children live at his or her domicile. This was recoded as "three." Another individual responded "seven," however, one child died. This was therefore recoded as "six."

Buddhism (n = 32 total) on the one hand, and those who mentioned playing games or gambling on the other (n = 24 total).[13] We therefore created dichotomous variables for whether or not people mentioned charity, the temple charity box, and/or sharing and another for whether or not people mentioned games or gambling.

Table 2 is a contingency table detailing the frequencies and expected values of mentioning the *khüree* or sharing versus games and gambling. According to Fisher's exact test, there is a significant difference in the proportions between whether or not participants mentioned the temple or charity and whether or not they mentioned gambling or gaming (OR = 0.06, 95% CI = [0.01, 0.29], $p <$ 0.001).

To determine whether or not prosocial religious framing effects affected gameplay, we created a dummy variable for the presence or absence of *khüree/charity* (absent = 0, present = 1) as a factor in the following analyses. A Fisher's exact test showed no relationship between condition (control vs. treatment) and mentioning the temple or charity (absent vs. present); the odds of being in either condition and mentioning/not mentioning the temple or charity were virtually identical (OR = 0.93, 95% CI = [0.35, 2.46], p = 1.00).

4.2. Experimental results

According to Shapiro-Wilk's test of normality, all raw allocations to cups were not distributed significantly differently from normal ($W \geq 0.97$, $p > 0.05$; see Table S1 for zero-order correlations of demographic variables and allocations). Notably, overall allocations were fairly distributed. Additionally, across games, the prime condition failed to dramatically alter allocation odds on its own; the Buddhist luck charm had no obvious effect on how people played (see supplementary Figures S1–S3 for illustrations of raw allocations by cup and condition). While we do report some interaction effects with condition (see below), these results should be interpreted with caution, given the low sample size and relatively wide confidence intervals in some cases.

4.2.1. Local Co-Religionist Game: *DISTANT vs. LOCAL*

Consistent with our predictions, in the first game (Table 3, Figure S1), there was a slight difference in raw allocations between the DISTANT (M = 14.53; SD = 2.49) and LOCAL (M = 15.47; SD = 2.49) cups with a preference for the latter (t = −1.70, p = 0.09, 95% CI = [−2.04, 0.16]).

Regression models are reported in Table 3. Note that direct model comparison based on AIC values is difficult when sample sizes fluctuate across model specifications. The model with the

Table 2. Contingency table for independence test of mentioning *khüree*/charity and games/gambling.

Mention *khüree* or charity?	Mention gambling or games?		Row Total
	No	Yes	
No	23	24	47
Expected Values	31.91	15.09	
Chi-square Contribution	2.49	5.27	
Row Percent	48.94%	51.06%	58.03%
Column Percent	41.82%	92.31%	
Total Percent	28.40%	29.63%	
Std. Residual	−1.58	2.30	
Yes	32	2	34
Expected Values	23.09	10.91	
Chi-square Contribution	3.44	7.28	
Row Percent	94.12%	5.88%	41.98%
Column Percent	58.18%	7.69%	
Total Percent	39.51%	2.47%	
Std. Residual	1.86	−2.70	
Column Total	55	26	Grand Total = 81

lowest AICc was Model 4 with a score of 372.70, Nagelkerke's $R^2 = 0.25$. The next best fitting model (Model 5) only differs by the inclusion of one extra individual, and had a ΔAICc of 3.62, $R^2 = 0.21$. The evidence ratio[14] between these two models indicates that Model 4 is 6.11 times stronger at minimizing information loss than the next best fitting model. These models should therefore be considered together.

Contrary to the prediction that supernatural punishment should generally reduce local favoritism, spirit-masters' punishment scores showed no effect, but trended toward increasing the odds of LOCAL favoritism (OR = 0.79, 95% CI = [0.60, 1.04], $p \leq 0.10$). This is intuitive, given that spirit-masters may mediate local concerns of territory and resource access (Purzycki, 2010). However, the more people claimed the Buddha knows, the more they favor local Buddhists as well (OR = 0.82, 95% CI = [0.63, 1.08], $p \geq 0.15$). This is counterintuitive if we assume the universality of Buddhism's moral applicability. Still, note that here too the odds ratio crosses 1, so the effect is not beyond chance. If we take Model 4 but include interaction terms between condition and spirit-masters' punishment or Buddha's knowledge, there is no significant interaction effect on allocation.

Inconsistent with previous work, material insecurity or confidence showed no effect on reducing the odds that a coin went to the DISTANT cup. However, years of formal education reduced the chances of a coin going to the Buddhist from Ak Dovurak (OR = 0.95, 95% CI = [0.91, 0.99], $p \leq 0.01$). Though inconsistent across models, in Model 4, fluency of Tyvan language predicted slightly greater odds (OR = 1.12, 95% CI = [1.01, 1.24], $p < 0.05$) of coins going to this geographically distant co-religionist.

4.2.2. Self Game: *DISTANT vs. SELF*

In the second game (Table 4; Figure S2), there were no significant differences between raw allocations between the SELF ($M = 15.30$, $SD = 2.95$) and DISTANT ($M = 14.70$, $SD = 2.95$) cups ($t = 0.90$, $p = 0.37$, 95% CI = [−0.71, 1.90]). Again, bearing in mind the caveat that direct model comparison with fluctuating sample sizes is problematic, ΔAICc between the best fitting model (Model 4: AICc = 396.42; Nagelkerke's $R^2 = 0.28$) and the next best (Model 3: AICc = 409.88, Nagelkerke's $R^2 = 0.38$) resulted in an evidence ratio of 837.15:1.

Spirit-masters' knowledge breadth (OR = 0.74, 95% CI = [0.58, 0.95], $p \leq 0.05$) and material insecurity (OR = 0.65, 95% CI = [0.48, 0.87], $p \leq 0.01$) corresponded to *lower* allocations to the Buddhist in Ak Dovurak. In other words, the more local spirits knew and the more participants worried about resources, the more likely a coin went into their own cup. There was no interaction effect between these two variables.

While the treatment failed to show any serious effect on its own, when people said that the game reminded them of the charity box at the temple in their post-experimental interviews, this did, however, predict a significant *increase* in the chances that a coin went to the Buddhist in Ak Dovurak (OR = 1.24, 95% CI = [1.05, 1.46], $p \leq 0.05$). In other words, thinking of religion and charity had a positive framing effect on allocating money to distant Buddhists. By dividing the difference between the raw and the predicted allocation of 15 for those who mentioned the temple or charity ($M = 16.12$; $SD = 3.18$) by those who did not ($M = 14.70$; $SD = 2.65$), we get an increase of allocation by a factor of 3.73. This effect held across all model specifications.

However, if we take Model 4, but include an interaction between condition and this framing effect, there is a *negative* effect (OR = 0.75, 95% CI = [0.55, 1.04], $p \leq 0.10$; AICc = 396.79, $N = 81$, Nagelkerke's $R^2 = 0.32$); in the treatment condition, the effect of framing the game in terms of charity or the temple decreases the chances that participants put a coin into the cup reserved for the distant co-religionists. Note, however, that mean allocation for not being in the prime condition, but thinking of charity or the temple ($N = 18$), was slightly higher than expected ($M = 16.89$, $SD = 3.16$), so this may be better interpreted as a reduction in generosity rather than fair play, but given the low sample size, this it difficult to tease apart without further investigation.

Table 3. Odds ratios and 95% confidence intervals for logistic regression models for *Local Co-Religionist Game* (DISTANT vs. LOCAL).

	Model 1	Model 2	Model 3	Model 4	Model 5
Variable	OR [Lower, Upper]	OR [Lower, Upper]	OR [Lower, Upper]	OR [Lower, Upper]	OR [Lower, Upper]
Treatment	1.06 [0.85, 1.31]	1.07 [0.86, 1.33]	1.05 [0.87, 1.28]	–	–
Khüree/Charity?	1.00 [0.82, 1.22]	1.00 [0.83, 1.22]	1.04 [0.87, 1.23]	–	–
Religiosity (BB)	1.04 [0.92, 1.17]	1.03 [0.91, 1.16]	1.02 [0.92, 1.12]	–	–
Punishment (BB)	1.05 [0.77, 1.45]	1.04 [0.76, 1.44]	0.97 [0.71, 1.29]	–	–
Knowledge (BB)	0.71 [0.47, 1.06]†	0.72 [0.48, 1.08]‡	0.77 [0.54, 1.09]‡	0.82 [0.63, 1.08]	–
Reward (BB)	1.00 [0.92, 1.09]	1.01 [0.93, 1.09]	1.00 [0.93, 1.07]	–	–
Religiosity (CE)	1.00 [0.90, 1.12]	1.00 [0.90, 1.12]	0.98 [0.88, 1.08]	–	–
Punishment (CE)	0.79 [0.52, 1.19]‡	0.83 [0.56, 1.24]	0.79 [0.56, 1.10]	0.79 [0.60, 1.04]†	0.78 [0.60, 1.01]‡
Knowledge (CE)	1.02 [0.72, 1.45]	1.01 [0.72, 1.43]	1.05 [0.77, 1.43]	–	–
Reward (CE)	1.02 [0.94, 1.10]	1.02 [0.94, 1.10]	1.01 [0.94, 1.09]	–	–
Age[a]	1.00 [0.99, 1.01]	1.00 [0.99, 1.01]	1.00 [0.99, 1.01]	–	–
Sex	1.04 [0.81, 1.33]	1.06 [0.83, 1.35]	1.01 [0.82, 1.25]	–	–
Children	0.99 [0.89, 1.09]	0.98 [0.89, 1.08]	0.99 [0.90, 1.08]	–	–
Material Insecurity	0.77 [0.52, 1.14]	0.77 [0.52, 1.15]	0.79 [0.55, 1.14]	–	–
Material Confidence	1.08 [0.83, 1.39]	1.08 [0.84, 1.40]	1.01 [0.82, 1.24]	–	–
Tyvan Language	1.13 [0.97, 1.31]‡	1.10 [0.95, 1.28]	1.15 [1.01, 1.30]*	1.12 [1.01, 1.24]*	1.12 [1.01, 1.24]*
Years Formal Educ.[a]	0.86 [0.72, 1.03]‡	0.94 [0.90, 0.99]*	0.94 [0.90, 0.98]**	0.95 [0.91, 0.99]**	0.95 [0.92, 0.99]**
Police Evaluation	0.97 [0.81, 1.16]	0.98 [0.81, 1.17]	–	–	–
DISTANT Emotion	0.96 [0.88, 1.05]	0.95 [0.88, 1.04]	–	–	–
LOCAL Emotion	0.97 [0.89, 1.06]	0.98 [0.90, 1.07]	–	–	–
OUTGROUP Emotion	0.96 [0.88, 1.05]	0.96 [0.89, 1.05]	–	–	–
Tyvan Lang.*Yrs. Educ.[a]	1.03 [0.97, 1.08]	–	–	–	–
Constant	1.30 [0.60, 2.83]	1.31 [0.60, 2.86]	0.97 [0.51, 1.86]	0.94 [0.61, 1.45]	0.80 [0.56, 1.15]
Game order included?	Y	Y	N	N	N
N	73	73	77	80	81
AICc	409.69	405.35	390.67	372.70	376.32
Mean VIF	4.21	2.21	1.63	1.10	1.11
Nagelkerke's R^2	0.53	0.51	0.37	0.25	0.21

Note: The DISTANT cup was the target cup. [a]Variable centered at mean. ‡$p \leq 0.15$; †$p \leq 0.10$; *$p \leq 0.05$; **$p \leq 0.01$. BB denotes *Buddha Burgan* and CE denotes *cher eezi*.

Table 4. Odds ratios and 95% confidence intervals for logistic regression models for *Self Game* (DISTANT vs. SELF).

	Model 1	Model 2	Model 3	Model 4
Variable	OR [Lower, Upper]	OR [Lower, Upper]	OR [Lower, Upper]	OR [Lower, Upper]
Treatment	1.00 [0.81, 1.24]	1.00 [0.81, 1.24]	0.96 [0.80, 1.17]	–
Khüree/Charity?	1.30 [1.07, 1.58]**	1.30 [1.07, 1.57]**	1.24 [1.04, 1.48]*	1.24 [1.05, 1.46]*
Religiosity (BB)	0.97 [0.86, 1.10]	0.98 [0.87, 1.10]	0.98 [0.89, 1.08]	–
Punishment (BB)	0.99 [0.72, 1.36]	0.99 [0.72, 1.36]	0.97 [0.72, 1.31]	–
Knowledge (BB)	1.17 [0.78, 1.75]	1.16 [0.78, 1.73]	1.15 [0.81, 1.63]	–
Reward (BB)	0.98 [0.90, 1.07]	0.98 [0.90, 1.06]	0.98 [0.91, 1.05]	–
Religiosity (CE)	1.06 [0.95, 1.19]	1.06 [0.95, 1.19]	1.07 [0.97, 1.18]	–
Punishment (CE)	1.13 [0.75, 1.70]	1.10 [0.74, 1.64]	1.03 [0.74, 1.44]	–
Knowledge (CE)	0.67 [0.48, 0.95]*	0.68 [0.48, 0.96]*	0.72 [0.52, 0.98]*	0.74 [0.58, 0.95]*
Reward (CE)	1.01 [0.93, 1.10]	1.01 [0.94, 1.10]	1.00 [0.93, 1.08]	–
Age[a]	1.01 [1.00, 1.02]	1.01 [0.99, 1.02]	1.01 [1.00, 1.02]	–
Sex	0.92 [0.72, 1.18]	0.91 [0.72, 1.17]	0.89 [0.72, 1.10]	–
Children	0.93 [0.84, 1.03]	0.93 [0.85, 1.03]	0.95 [0.87, 1.04]	–
Material Insecurity	0.69 [0.47, 1.03]†	0.69 [0.47, 1.03]†	0.72 [0.50, 1.05]†	0.65 [0.48, 0.87]**
Material Confidence	1.15 [0.89, 1.49]	1.15 [0.89, 1.49]	1.15 [0.94, 1.41]	–
Tyvan Language	1.04 [0.89, 1.21]	1.05 [0.90, 1.21]	1.02 [0.91, 1.14]	–
Years Formal Educ.[a]	1.05 [0.88, 1.25]	1.02 [0.97, 1.07]	1.01 [0.97, 1.05]	–
Police Evaluation	0.94 [0.78, 1.13]	0.94 [0.78, 1.13]	–	–
DISTANT Emotion	1.00 [0.91, 1.09]	1.00 [0.92, 1.09]	–	–
LOCAL Emotion	1.00 [0.91, 1.10]	1.00 [0.91, 1.09]	–	–
OUTGROUP Emotion	1.02 [0.94, 1.12]	1.02 [0.94, 1.11]	–	–
Tyvan Lang.*Yrs. Educ.[a]	0.99 [0.94, 1.04]	–	–	–
Constant	1.08 [0.50, 2.37]	1.08 [0.50, 2.36]	1.17 [0.61, 2.24]	1.47 [1.12, 1.94]
Game Order Included?	Y	Y	N	N
N	73	73	77	81
AICc	434.90	429.70	409.88	396.42
Mean VIF	4.17	2.22	1.63	1.04
Nagelkerke's R^2	0.44	0.44	0.39	0.28

Note: The DISTANT cup was the target cup. [a]Variable centered at mean. *$p \leq 0.05$; **$p \leq 0.01$. BB denotes *Buddha Burgan* and CE denotes *cher eezi*.

Table 5. Odds ratios and 95% confidence intervals for logistic regression models for *Individualist Game* (LOCAL vs. SELF).

	Model 1	Model 2	Model 3
Variable	OR [Lower, Upper]	OR [Lower, Upper]	OR [Lower, Upper]
Treatment	1.03 [0.83, 1.28]	1.03 [0.83, 1.27]	–
Khüree/Charity?	0.94 [0.77, 1.14]	0.92 [0.77, 1.11]	–
Religiosity (BB)	1.01 [0.90, 1.14]	0.99 [0.89, 1.09]	–
Punishment (BB)	0.88 [0.64, 1.21]	0.91 [0.67, 1.24]	–
Knowledge (BB)	1.58 [1.05, 2.36]*	1.56 [1.07, 2.28]*	1.44 [1.08, 1.93]*
Reward (BB)	0.99 [0.91, 1.07]	0.99 [0.91, 1.06]	–
Religiosity (CE)	0.98 [0.87, 1.09]	0.97 [0.87, 1.07]	–
Punishment (CE)	1.13 [0.75, 1.70]	1.12 [0.78, 1.59]	–
Knowledge (CE)	0.97 [0.69, 1.38]	0.97 [0.71, 1.33]	–
Reward (CE)	1.01 [0.93, 1.09]	1.01 [0.94, 1.09]	–
Age[a]	1.00 [0.98, 1.01]	1.00 [0.99, 1.01]	–
Sex	0.92 [0.71, 1.18]	0.88 [0.71, 1.09]	–
Children	1.04 [0.94, 1.15]	1.03 [0.93, 1.13]	–
Material Insecurity	0.88 [0.59, 1.31]	0.92 [0.63, 1.34]	–
Material Confidence	0.93 [0.72, 1.20]	1.04 [0.84, 1.29]	–
Tyvan Language	0.94 [0.81, 1.09]	0.90 [0.78, 1.03][†]	0.89 [0.80, 1.00]*
Years Formal Educ.[a]	1.28 [1.07, 1.53]**	1.31 [1.11, 1.55]**	1.33 [1.13, 1.55]***
Police Evaluation	0.98 [0.82, 1.18]	–	–
DISTANT Emotion	1.04 [0.95, 1.13]	–	–
LOCAL Emotion	0.94 [0.86, 1.03]	–	–
OUTGROUP Emotion	1.02 [0.94, 1.11]	–	–
Tyvan Lang.*Yrs. Educ.[a]	0.94 [0.89, 0.99]*	0.93 [0.89, 0.98]**	0.93 [0.89, 0.97]**
Constant	0.92 [0.42, 2.00]	0.90 [0.45, 1.80]	0.92 [0.56, 1.52]
Game Order Included?	Y	Y	Y
N	73	77	80
AICc	425.73	424.49	393.95
Mean VIF	4.22	4.04	8.65
Nagelkerke's R^2	0.49	0.45	0.39

Note: The LOCAL cup was the target cup. [a]Variable centered at mean. [†]$p \leq 0.15$; *$p \leq 0.05$; **$p \leq 0.01$; ***$p \leq 0.001$. BB denotes *Buddha Burgan* and CE denotes *cher eezi*.

4.2.3. Individualist Game: *LOCAL vs. SELF*

There were also nonsignificant differences in raw allocations between the two cups in this game ($t = 0.73$, $p = 0.47$, 95% CI = [−0.81, 1.74]; Table 5, Figure S3). In the best fitting model in Table 5 (Model 3: AICc = 393.95; Nagelkerke's $R^2 = 0.39$), holding the interaction between Tyvan language fluency and years of formal education constant, Buddha's knowledge breadth (OR = 1.44, 95% CI = [1.08, 1.93], $p \leq 0.05$) increased the odds that a coin went into the cup for a Buddhist from Kyzyl. This effect held across models. Better self-reported abilities in the Tyvan language, however, predicted lower odds of a coin going into the LOCAL cup (OR = 0.89, 95% CI = [0.80, 1.00], $p \leq 0.05$), though the effect fluctuated across model specifications. If we take Model 3 and cross condition and Buddha's knowledge breadth, there is evidence of a positive interaction (OR = 1.96, 95% CI = [0.99, 3.97, $p \leq 0.10$], $N = 80$, AICc = 395.71, Nagelkerke's $R^2 = 0.44$); playing in proximity of the Buddhist charm increases the chances of allocating a coin to a Buddhist from Kyzyl as Buddha's knowledge scores increase.

5. Discussion

The present work provides some mixed support for the prediction that religious beliefs can affect cooperation. After holding key indicators of social class constant, supernatural monitoring played the most consistent role in the allocation of money across games: spirit-masters' knowledge breadth increased with the chances that participants favored themselves over Buddhists from Ak Dovurak, and the more participants claimed Buddha knew, the more likely they were to allocate coins to their local community when they themselves stood to gain. The only consistent effect for supernatural punishment specifically was that found for spirit-masters, whose punishment increased local favoritism at the expense of geographically remote Buddhists. As Buddha's and spirit-masters' attributed knowledge breadth or punishment had no obvious effect on the expansion of prosociality, these results pose problems for the prediction that religious beliefs can expand cooperation beyond parochial boundaries. The strongest indicator of this, however, was how participants framed the experiment; when players could have made more money, if they thought of charity or the Buddhist temple, they were more likely to give money to Buddhists from Ak Dovurak.

Aside from the slight differences found between the cups in the first game, participants largely followed the rules of gameplay. One consequence of fair play in such games is that using predictors to estimate the odds of putting a coin into any given cup is quite difficult. There are a few potential reasons why, overall, Tyvans did not systematically bias allocations. One possibility is that the setting of the experiments introduced issues of propriety and participants cheated less than they otherwise would have. The fact that the bulk of the experiments were conducted at our apartments rather than a mock laboratory may have altered how people comported themselves. One sociological factor involved in this lack of bias in allocations might be that the relatively higher cost of living and national (albeit Russian) per capita gross domestic product is quite high, and this has been shown to correspond to gameplay cross-culturally (see Purzycki et al., this volume; Hruschka et al., 2014). How this trickles down to this remote region, however, remains open to speculation. Given that the economy in Kyzyl is overwhelmingly market-based, this may also play a significant role in allocations (see Henrich et al., 2010). Follow-up studies comparing urban and rural residents could provide a clearer view of the market's impact on gameplay.

Again, the strongest religiosity variables actually increased self and local favoritism. This may be due to the syncretic relationship between Buddhism and traditional local spirit piety; local spirits are thought to be bound in space and herding territory (Purzycki, 2011, 2013a, 2013b) and this may induce a strong local bias that an otherwise universalist tradition like Buddhism has difficulty overriding. However, there is clearly a systematic distinction between Buddhist doctrine and Tyvans' Buddhist beliefs (see Purzycki, n.d.), and it is unclear how effectively Buddhism's universalist doctrine has translated to individual beliefs. Future research should emphasize accounting for explicit beliefs about gods' jurisdictions and preferences for constituents' prosociality more thoroughly.

However, in the second game (SELF and DISTANT), people who thought of Buddhism and charity when asked what the game reminded them of were more likely to give more coins to the DISTANT player. While lending partial support to the social expansion hypothesis, this result also highlights the importance of framing effects – wherever their source – and their control in economic games (Cronk, 2007; Gerkey, 2013; Liberman et al., 2004). If people adopt particular modes of play due to features of the games, they may shift strategies to conform to norm expectations specific to that context. Researchers effectively do this when introducing primes to participants (e.g., Shariff & Norenzayan, 2007, 2011). In the present case, Tyvans drew from their own analogous models that functioned as self-generated framing or priming effects (or *post-hoc* analogues to general decision-making strategies). Using framing effects as a prime might actually function as a better mechanism than a physical prime in similar studies. The current prime interacted with some key variables, but these results were inconsistent across games. This may have been due to a host of factors such as Tyvans' use of the charm for luck rather than a symbol of prosocial behavior. If so, this should serve as an illustration as to why it is crucial to conduct preliminary assessments of how people actually view the object prime.

Indicators of social class also played a significant role in allocations. The fact that self-reports of fluency in Tyvan had fairly consistent effects on the outcome of the study is quite notable given how significant a role native language plays in the region (non-Tyvan-speaking Tyvans are often viewed as "too Russian"). The better self-reported fluency was, the more likely coins went to players (vs. LOCAL) and to LOCAL Buddhists (vs. DISTANT). Given that the Tyvan language has been such a success story in the preservation of endangered languages, and is an important variable in individuals' sensibilities of identity, places where native language is a national concern may play a greater role than religion in times of radical transition and ethnic identity formation (see Chevalier, 2010, 2013; Harrison, 2007).

Also indicative of the importance of class as a barrier to cooperation in Tyva, years of formal education increased the odds that coins went to the LOCAL cups in the *Local Co-Religionist* and *Individualist Games*. While better education increases Tyvans' willingness to sacrifice coins that they could give to themselves, it also *decreases* allocations to Buddhists in Ak Dovurak. Increased material insecurity predicted greater SELF (vs. DISTANT) and LOCAL (vs. DISTANT) favoritism. These results likely reflect an emergent classism among Tyvans in Kyzyl. Even though "emotional closeness" to Buddhists in Ak Dovurak showed no strong effects on allocations outside of the LOCAL favoritism (vs. DISTANT), other factors otherwise unaccounted for may have contributed to such discrepancies (i.e., "emotional closeness" is not a good measure of what might be driving class-based favoritism here). Indeed, there is undoubtedly a stigma toward rural Tyvans, especially those from the western region who have a reputation for lawlessness. Crude, high-inference measures like "emotional closeness" might not capture such attitudes.

Note, too, that while slight, years of formal education had a negative relationship with emotional closeness to Buddhists in Kyzyl ($r = -0.14$, $p \leq 0.15$) as well as those in Ak Dovurak ($r = -0.21$, $p \leq 0.15$). In similar experiments, when other players are specifically targeted samples such as "Buddhists from Ak Dovurak," researchers ought to investigate participants' attitudes toward other players more thoroughly than the present study did, particularly in cases like Tyva where there is such a radical shift between the urban life of Kyzyl and the rural life of Ak Dovurak and its nearby villages and herding communities. Considering the manifold threats to parochial and expanded cooperation, researchers interested in religion's role in these processes would be best served with more detailed and validated measures that capture interclass and community attitudes.

Notes

1. Current evolutionarily minded discussions about religion include, but are not limited to: whether or not false beliefs can function adaptively (i.e., induce behaviors that positively affect individual genetic fitness; see Johnson, 2009; Johnson, Blumstein, Fowler, & Haselton, 2013; McKay & Dennett, 2009; Schloss & Murray, 2011);

whether or not beliefs require other devices (e.g., ritual) to bolster their stability and prevalence (Bulbulia, 2004; 2008, Johnson, 2011; Sosis & Kiper, 2014); which level and kind of selection best describes their evolution and distribution (Norenzayan et al., 2016; Shaver, Purzycki, & Sosis, forthcoming); the explanatory supremacy of biology or culture (Boyer, 1994); and whether religion is properly framed as adaptive, maladaptive, or a functionless by-product (Sosis, 2009). What is likely required to move some of these debates forward is some consensus on what kind of evidence we require to satisfactorily resolve them and longitudinal, multi-site studies with attention to measurable social and ecological variation (see, e.g., Botero et al., 2014). These debates are fueled by different interpretations of the same evidence. Addressing these concerns is beyond the scope of the present study, however, and while the results do lend themselves to multiple interpretations, the most immediate *explanandum* here is fairness, not religious beliefs or practices.

2. Note that the use of "explain" here does not require unidirectionality; beliefs and social complexity can co-evolve in a feedback loop. Considerable evidence associates "moralistic high gods" with societal complexity (Johnson, 2005; Stark, 2001; Swanson, 1960; Wallace, 1966), and recent cultural phylogenetic evidence from Austronesian traditions suggests that moralistic deities evolved after the development of social complexity (Watts et al., 2015). None of these studies, however, firmly establishes causation one way or another.

3. This includes the reindeer-herding Tozhu from the north-east region. These statistics are from the 2010 census accessible at http://www.gks.ru/free_doc/new_site/perepis2010/croc/Documents/Vol4/pub-04-07.rar (accessed 13 July 2015). Ethnic Russians comprise about 16% of the population (49,434).

4. http://www.ethnologue.com/show_language.asp?code=tyv (accessed 29 November 2012).

5. We use all Tyvan words in their singular form as group nouns for the sake of clarity and concision.

6. The imposition of such a tribute system should not be surprising. However, it is important to note that this passage was written during Soviet times by someone with no qualms about coloring his language with political support and anti-religious sentiment: "Liquidation of the political, economic and cultural backwardness of the Tuvans dragged on and on and only got going in the proper way when the Tuvans had become part of the USSR" (Potapov, 1977, p. 49).

7. http://sreda.org/en/arena. Accessed January 21, 2015.

8. Upon our asking how representative such beliefs are and about their inconsistency with Buddhist doctrine (see De Bary, 1969), a monk we interviewed said virtually all Tyvans believe this. The majority of the present study's sample appears to view Buddha as such (see section 3.5). While it is plausible that Christian influence of ethnic Russians has contributed to this view (see Purzycki, 2016), how this has happened after Soviet religious oppression with such a large Tyvan ethnic majority requires further examination.

9. All protocol materials, including scripts and visual scales, are available at http://www.hecc.ubc.ca/cerc/the-cultural-evolution-of-prosocial-religions/. Data and an R script for the present manuscript are available at https://bgpurzycki.wordpress.com/.

10. The Four Noble Truths are variously stated as: (1) Life is full of suffering; (2) The source of this suffering is desire; (3) Suffering ends when desire ends; (4) Desire ends by following the eightfold path. The eightfold path consists of proper: (1) Views/understanding; (2) Thought/resolve; (3) Speech; (4) Action; (5) Livelihood; (6) Effort; (7) Mindfulness; and (8) Concentration (De Bary, 1969, p. 16; Rahula, 1974, p. 45).

11. http://www.tuvastat.ru/digital/region12/2007/10.3.htm. All of these values were based on exchange rates in 2013.

12. We asked this question on the five-point Likert scale (see Purzycki et al., this volume).

13. Other things that people were reminded of were "the white and black sides of life, what is good and bad," "thought about real people I know in Kyzyl and Ak Dovurak, we should all be united," "shopping," "memory," among others. Twenty-three individuals mentioned neither, which explains the low odds ratio.

14. The calculation for the evidence ratio is: $\exp((AICc_x - AICc_{min})/2)$. See Burnham et al., 2011.

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