Religion, Parochialism and Intuitive Cooperation

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Abstract

Religions promote cooperation but they can also be divisive. Religious identity, while signaling trustworthiness, provides opportunities for out-group discrimination. Although implicit distrust of atheists is widespread, it remains to be studied whether religious prejudices induce intuitive discrimination in actual cooperation behavior. Evidence supporting the social heuristics hypothesis (SHH) finds intuitive cooperation to be independent of group identity. We test this prediction for religious group identity in a one-shot prisoner's dilemma game, where practicing Christian believers are paired either with a coreligionist or an atheist and where time-limits are used to increase reliance on either intuitive or deliberated decisions. We also explore an alternative dual-process account of cooperation, the self-control account (SCA), which suggests that visceral reactions tend to be selfish and that cooperation requires cognitive effort. While support for SHH indicates that cooperation is intuitive in general, suggestive evidence for SCA instead implies that intuitive cooperation may be parochial.

Many world religions have scriptures and rituals that regulate prosocial behavior. It is perhaps not a coincidence that the expansion of large-scale cooperative networks has coexisted with the emergence and spread of these religious teachings and practices[1–4]. Historical records, cross-cultural studies, and laboratory results indicate that religious belief—whether as an evolutionary adaptation or by-product but certainly as a widespread cultural phenomenon[5]—promotes cooperation, at least among believers[3,6–8]. However, it is not yet clear whether the cooperativeness of religious believers is general (i.e., inclusive of out-groups) or whether it is parochial (i.e., biased against out-groups)[9–12]. The distinction is crucial to ongoing debates on the role of religion in the public sphere[13,14], since parochialism would emphasize the need to protect religious minorities and secular institutions. Furthermore, the form that these protections should take (e.g., behavioural interventions or "nudges") depends on the cognitive underpinnings of the phenomena in question, such as whether religious discrimination is intuitive (e.g., relying on spontaneous associations and simple heuristics) and whether it is amenable to change through deliberation.

Cooperation often requires one to make a personal sacrifice for the sake of group benefit. Various psychological and social mechanisms have been put forward to explain how religious belief promotes cooperation. Belief in god can increase cooperation in social dilemmas through motivational mechanisms that counteract incentives to freeride. Such changes in incentive structures can be achieved through religious teachings of benevolence[15] as well as through fear of a punitive and omnipotent god[16,17]. Consistent with this motivational view, the psychological salience of religious and punitive concepts have been found to increase altruism towards anonymous others[18,19], and regular attendance at religious services has been associated with charitable giving[20]. Religious belief can also support cooperation through its positive effects on trust and the consequent coordination of behavior[9]. Given the prosociality of religious behavioral norms and the fear of punishment for their violation, one's social identity as a religious believer works as a valuable signal of trustworthiness in reciprocal social interactions. Because most people in social dilemmas are willing to cooperate conditionally (i.e., to the extent that they believe others will cooperate)[21–24], religious identity further strengthens cooperation[9,25], particularly in religious social networks[26–28].

In short, religious belief promotes cooperation, especially if religious identity is a reliable signal of trustworthiness and prosociality. However, personal benefits of signaling religiosity expose religious identity to exploitation by free-riders posing as religious believers. This threat is often countered by costly displays of faith (e.g., regular participation in public rituals), which help screen out those without genuine belief in god (or fear of supernatural punishment) for whom the psychological costs of participation are often too high[7]. The consequent increase in the reliability of this socially valuable information may, however, come at the cost of increased distrust and systematic discrimination against atheists and believers of other religions.

The evidence remains mixed regarding the question of whether religious prosociality is general or parochial. Whereas widespread anti-atheist prejudice suggests parochialism[9,11], some studies find that religiosity increases altruism and cooperativeness in general[12], even towards atheists[10]. Recent cross-cultural evidence for the parochialism of religious belief further suggests that religious prejudice may be intuitive, taking shape through spontaneous associations[11,29]. These findings motivate us to ask whether intuitive religious biases in judgments extend to behavioral biases in cooperation, namely, whether religious cooperation is intuitively parochial, and whether deliberation can help avoid such discrimination.

The primary goal of our study is to investigate the extent to which the Social Heuristics Hypothesis (SHH) provides answers to these questions. Built on the background of dual-process models of the mind[30], SHH posits that social decisions can be driven either by more intuitive and low-effort or by more deliberated and high-effort cognitive processes[31–33]. According to SHH, intuitive decisions reflect simple heuristics acquired in previous social interactions, which tend to be cooperative[32]. Supporting SHH, cognitive process manipulations that enhance intuitive thinking (such as time-pressure, cognitive-load or priming) have been shown to increase cooperation in games involving social dilemmas[31,32,34–36]. Furthermore, previous tests of SHH among natural and minimal groups showed both strong group bias and intuitive cooperation but no interaction between cognitive and group manipulations[34,37–39]. Consequently, accumulated evidence for SHH supports the hypothesis that cooperation is intuitive in general (i.e., independent of group identity).

We will test the generality of intuitive cooperation derived from evidence on SHH by observing cooperation behaviour of practicing religious believers in a one-shot continuous

prisoner's dilemma (PD) game[40]. In the PD game, a pair of participants individually and simultaneously decides how much of an initial monetary endowment to keep for themselves and, as our measure of cooperation, how much to give to the other participant, where any money given is doubled before being transferred. PD constitutes a social dilemma by making personal monetary sacrifice necessary for increasing the pair's total earnings. In the PD game, practicing Christians will be randomly paired with either a coreligionist or an atheist, and PD decisions will be elicited either under time-pressure (for inducing decisions that are relatively more intuitive) or under time-delay (for inducing decisions that are relatively more deliberated). Hence, we study group bias in cooperation among practicing believers by randomly manipulating the religious identity of their pair in the PD game, while at the same time manipulating the cognitive processes involved in their PD decision.

H_1: Believers will be *intuitively cooperative in general* such that those assigned to the intuition condition will be more cooperative than those assigned to the deliberation condition independent of the religious identity of their pairs. We will seek evidence for H_1 by jointly testing for the main effect of time-limits in the hypothesized direction *and* for the lack of an interaction effect with pair's religious identity (see Methods).

In contrast with the above-mentioned evidence supporting SHH, the generalizability of the phenomenon of intuitive cooperation has been questioned[41,42]. Since cooperative heuristics thrive in contexts of routine cooperation and wither with routine exposure to selfishness[43–45], a likely explanation for the strength of intuitive cooperation is variation in background social experiences and the consequent differences in social heuristics[32,46].

Hence, a secondary goal of our study is to explore whether an alternative approach, the Self-Control Account (SCA), can provide further insights into the psychology of cooperation: SCA posits that automatic visceral reactions are often selfish and that cooperation requires effortful deliberation and self-control[47,48]. Regular participation in communal religious practices may result in experiences where prosociality and trust towards coreligionists emerge as a cooperative heuristic, and where atheism may be (even if implicitly) associated with selfishness and distrust. For a believer, the identity of an interaction partner as a practicing coreligionist would then cue cooperative heuristics, while the prospect of interacting with an atheist may cue selfish heuristics[26]. Particularly for this latter case, SCA suggests that deliberation might increase

cooperation by allowing control over visceral selfish reactions[47–50] and by encouraging impartial moral judgments of fairness and equality[51–53]. Nevertheless, with one recent exception[47], evidence supporting SCA remains correlational and suggestive. Support for our exploratory analysis of SCA will provide a basis for future confirmatory hypothesis tests.

While our study will provide a strong test of SHH in the context of naturally occurring (and possibly contrasting) heuristics, our design also allows exploration, based on suggestive evidence for SCA, whether religious cooperation behavior is intuitively parochial. Specifically, a general dual-process explanation of parochialism in cooperation would be possible if SHH were valid only for in-group while SCA were valid only for out-group behaviour. A general intuitive cooperation account of SHH, however, predicts intuitive cooperation independent of whether the recipient is in-group, out-group or without group identity. While the in- and out-group conditions will provide a comparison of these contrasting predictions, we will also run a control condition without identity manipulation allowing a test of SHH as in the original studies[31]. The comparison of SHH's deliberated selfishness account with SCA's deliberated cooperation account will help us to further investigate whether deliberation can be employed to prevent intuitive religious parochialism.

Methods

Overview

Our research complies with all relevant ethical regulations. Ethics approval was obtained from the University of Leeds Research Ethics Committee, and informed consent will be received from participants at the outset of the study. An incentivized prisoner's dilemma (PD) game will be used to study cooperation behavior. Participants will be recruited from previously self-declared practicing Christians and atheists, who will be randomly assigned to one of six cells while playing the PD. The study will focus on the decisions of Christian participants. The experiment will involve a 3 (religious group identity of one's pair in the game: practicing Christian, atheist or no identity) by 2 (time-limit: 10s time-pressure or 20s time-delay) between-subjects design. Participants and the researchers will be blind to the conditions of the experiment during data collection.

Power Analysis

We estimate our sample size based on the hypothesized main effect, and let this sample size determine the smallest effect size that can be detected for the hypothesized lack of an interaction effect. To do so, we use the most relevant main effect size for time-limit manipulations found in the literature[35]— a test of SHH on a sample recruited from Prolific using a similar protocol (f = 0.11). Because the one-shot PD game will not involve interaction or feedback, each individual decision in the game constitutes an independent observation. To detect a main effect of time-limit of this size in a two-way ANOVA model with $\alpha = 0.05$ and $1 - \beta = 0.95$, we estimated using G*Power 3.1.9.2 that our sample should consist of at least 1280 believers[54]. Sensitivity analysis indicated that the minimum interaction effect size that can be detected in a two-way ANOVA model with $n = 1280$, $\alpha = 0.05$ and $1 - \beta = 0.95$ is $\eta^2 = 0.012$, which we take to be our smallest effect size of interest (SESOI).[55,56] Although we will focus on the behaviour of believers, we will avoid deception by also recruiting 1280 atheists, who will be paired either with each other or with believers in the PD game.

Hypothesis Tests

In a two-way ANOVA model of the PD decisions of religious believers on religious identity and time-limit factors, H_1 would be supported by evidence (1) for intuitive cooperation in a null-hypothesis significance test (i.e., significant main effect of time-limits on cooperation such that cooperation is higher under time-pressure than under time-delay) *and* (2) for the generality of intuitive cooperation in a one-tailed equivalence test showing lack of a significant interaction effect. While step (1) is operationalized as indicating evidence if $p < 0.05$, evidence in step (2) would be indicated by the upper bound of the 90% confidence interval of the interaction effect size (η^2) being less than 0.012 (i.e., excluding the SESOI). In step (2), we will also calculate a Bayes Factor (BF) for the interaction effect as confirmation such that $BF \leq 1/3$ will be interpreted as substantial evidence for the null result. All tests will be two-tailed, except for equivalence testing in step (2).

Participants

We will recruit participants from Prolific (https://prolific.co/) and conduct our experiment online. Data generated online, including Prolific, has been shown to replicate various well-established laboratory results[57,58], including incentivized games measuring cooperation[59]. We use Prolific because it allows prescreening based on a previously completed comprehensive demographic

questionnaire, including religious affiliation and practices. Participants will be adult US residents with fluent English. Practicing Christians will be selected among those who in the Prolific questionnaire answered "Christianity" for the question "What is your religious affiliation?" and chose either "Yes. Both public and private." or "Yes. Public only." for the question "Do you participate in regular religious activities?" Atheists will be recruited among those who answered "Non-religious" to the religious affiliation question and who then qualified their answer as "Atheist" in the follow-up question "Which of the following do you most identify as?" In case we cannot reach our planned sample size of practicing Christians by the end of a two-week recruitment period, we will complete recruitment from the larger pool of practicing and non-practicing Christians in the US. Participants with complete submissions will earn a participation fee ($0.25), in addition to their earnings from the PD game.

Materials and Procedure

Procedure. We will conduct the experiment using the *Qualtrics* software (www.qualtrics.com). After eliciting informed consent, participants will receive training on the slider tool to increase their familiarity with the interface for eliciting PD decisions[35]. They will next read a general description of the study, explaining that there are three parts and that after the study is over one part will be selected at random for determining participant's additional payments from the study. Participants will not be informed about the tasks involved in upcoming parts beforehand. The first part will include the main task, the one-shot PD game, whereas the other two parts will include exploratory measures of social dilemma comprehension and social expectations (see below). The procedure for randomly selecting one of the three parts for determining additional payments is an effective cost-saving method well-established in experimental economics[60], with theoretical support for its incentive-compatibility[61] and significant evidence that participants consider each part independently[62,63].

The main task will elicit behavior in a one-shot PD game and include the experimental manipulations. Compliance with time-limits will be incentivized to strengthen cognitive manipulations[35]. After reading the instructions for the PD game at their own pace, a transitory screen will explain the time-limits and the monetary incentives for compliance. This screen will be displayed for at most 30s or less if participants choose to proceed earlier, allowing time for reading while preventing deliberation about the upcoming task. Next will be the PD decision

screen, which will—for participants in the identity manipulation conditions—first reveal an "online profile" of each participant's pair in the game and, after two seconds, will display the slider tool and a timer. The PD decision will be elicited under one of two time-limit conditions (i.e., 10s time-pressure or 20s time-delay). Afterward, manipulation checks and exploratory measures will be elicited, followed by a brief questionnaire including basic demographic information.

Prisoner's Dilemma (PD). We will use a one-shot continuous prisoner's dilemma (PD) game, relying on instructions used in the previous literature[39]. In the PD, a pair of participants will individually decide, without observing each other's actions, how much of $0.50 to keep and how much of it to allocate (in 1 cent increments) to their pair. Amount allocated to the pair (whole number ranging from 0 to 50 cents) is our measure of cooperation. Participants will earn double the amount allocated to them by their pair in addition to any money they kept for themselves. From each participant's perspective, the game involves a strict trade-off between personal earnings and total earnings by the two participants, rendering it a social dilemma. In a previous social dilemma experiment on Prolific (N = 3,653), using a four-people public good game with marginal per capita return of 0.5, we found that 63.6% of endowments was given to the public good (SD = 29.6), that 6.4% of participants had given nothing and that 25.1% had given everything[47]. With substantially lower time and effort required for its completion (circa 5 min), our study provides a ratio between endowment size and opportunity cost that is comparable to laboratory studies. Furthermore, a large-scale meta-analysis found no overall effect of stakes on giving in dictator games[64] and similar findings are reported elsewhere[65–69]. Finally, a recent study found evidence of religious prosociality in low-stake ($1) games using explicit primes[70].

Group assignment. Practicing Christians will play the PD game in equal probability either with another practicing Christian (in-group), with an atheist (out-group) or with someone without identity information (control). Participants will not know that they have been recruited based on their religious identity because the prescreening questions have been elicited beforehand by Prolific. Participants in the identity manipulation conditions (but not those in the control condition) will be informed on the PD instruction screen that the decision screen will show an "online profile" describing one's pair in the game. Specifically, modifying a previously established method[10], the decision screen will reveal (in balanced Latin Square order) the other

participant's religious identity ("practicing Christian" or "Atheist") together with four constant, in-group identity information categories (country of residence, age group, language, and experimental platform). This approach is intended to minimize demand characteristics (since deciding based on multiple identity categories makes religious belief less focal) and to increase the realism of the experimental setting (since acquiring information from social media profiles with these kinds of group identity categories is a familiar experience). Identity information will be paired with symbols to speed comprehension (e.g., the Christian cross, the atheism symbol, a map of the US, etc.).

Time-limit manipulations. The PD decision will be elicited either under 10s time-pressure with prompts to "be quick" or under 20s time-delay with prompts to "carefully consider" the decision. Based on previously developed methods, we will incentivize compliance with time-limits[35], and we will inform participants that additional earnings from PD are highly likely to be invalidated by noncompliance. The uncertainty prevents the annulment of incentivization that could otherwise occur in case of non-compliance. We will in fact randomly choose 90% of noncompliant decisions to be invalid. We will not inform participants of the probability of invalidation for noncompliance ($p = 0.9$) so as not to induce a calculative mindset.

Control Measures

We provide various controls to check whether: (1) our manipulations affected decision processes as intended, (2) the information used for sample selection is accurate, (3) our sample is representative in that it replicates well-established behavioural biases, and our results are (4) robust when controlling for experience and comprehension in the PD game and (5) specific to religious believers or generalizable to other natural groups.

Manipulation checks. We commit to three tests to check that our manipulations worked as intended. First, as a behavioural test of time-limit manipulations, we will check whether the median response time under time-pressure is faster than the median response time under time-delay using a Wilcoxon rank-sum test. In addition, immediately following the PD game, three questions will be elicited in two randomly presented screens to check that time-limit and religious group identity conditions manipulated cognitive processes as intended. On the time manipulation check screen, participants will rate in random order their agreement with two statements on a 7-point scale: 1) "I did not have time to think through my decisions" (indicating

limited opportunities for deliberation), 2) "I decided based on my 'gut reaction'" (indicating increased spontaneity of decisions). As an indication of successful manipulation of cognitive processes by time-limits, an independent samples *t*-test of significant differences in average scores for the two questions between the two time-limit conditions will be estimated. On the group identity manipulation check screen, participants will complete the online version of the Inclusion of the Other in the Self (IOS) Scale, a simple and reliable measure of subjective closeness of social relationships[71]. The 7-point IOS question will ask active participants to select one of seven pairs of circles with increasing areas of intersection that best describes the relationship between the active participant ("You") and the passive participant ("Other"). Successful group manipulation will be indicated by a significant difference in an independent samples *t*-test between the in-group and out-group conditions.

Screening information check. Information on religious affiliations and practices was previously elicited by Prolific. We will use two of these questions as screening criteria during data collection (see the Participants section above). The survey section of our study will also elicit answers to these questions, to check the accuracy of the information used in the selection of practicing Christians. If the religious affiliation question shows a match rate that is less than 90% then we will also report the hypothesis test result based on the identity information elicited in our survey.

Sample behaviour check. The design allows a test of whether our sample of believers is representative in showing commonly observed biases. A significant main effect of religious group identity in the two-way ANOVA, such that believers cooperate more with other believers than with atheists, will replicate the commonly observed group bias.

Experience and comprehension check. The PD game will be described in a survey question to elicit participants' experience with the game from past participation in experiments. In addition, we will measure comprehension of the social dilemma by eliciting via sliders what participants think are the self-gain maximizing strategy (i.e., keeping all endowment for self) and the group-gain maximizing strategy (i.e., giving all endowment to the recipient) in the PD game. Participants will have the opportunity to earn \$0.25 for each correct answer. We will consider those who incorrectly answer either question as having miscomprehended the social dilemma

but—as standard[36]—we will not exclude them from the analysis. We will report the hypothesis test result also controlling for experience and miscomprehension as covariates.

Result generalizability check. As compared to atheists, practicing believers are more likely to have experienced cooperative interactions (and adopted cooperative intuitions) based on religious identity. If we find evidence for the hypothesis of intuitive cooperation among believers, we will test for intuitive cooperation among atheists to check whether evidence for the hypothesis extends to other natural groups.

Additional Exploratory Measures

Expectations. Participants will predict the allocation made by their pair. To incentivize truthful reporting of expectations, participants will have the opportunity to earn $0.50 for predictions that are accurate within 5 cents. Expectations provide a measure of trust towards one's pair[72]. We will explore if differences in expectations are consistent with differences in cooperation behavior (e.g., group bias).

Conflict. We will elicit self-reported subjective conflict experienced during the PD decision. The measure, based on Kocher et al. (2017), uses a scale ranging from 0 (not at all) to 100 (very much) as response to the question "Some participants find it difficult to make a decision regarding how much money to keep personally and how much to share with others because they find the two goals equally important. To what extent did you experience such a conflict when making your decision?" We will explore whether experimental manipulations affected the experience of decision conflict.

Data exclusions

Incomplete and duplicate submissions will be excluded from the analyses. We will consider a submission to be complete if it has a valid Prolific ID, which anonymously refers to a unique participant, and if all parts, including the survey, have been completed. Based on Prolific ID, we will exclude duplicate submissions except for the initial submission, if this initial submission is complete and if it does not coincide in time with another submission by the same participant.

Protocol registration

The Stage 1 protocol for this Registered Report was accepted in principle on [DATE]. The protocol, as accepted by the journal, can be found at [URL].

Data availability

The data that support the findings of this study are available at the OSF study preregistration page, [HYPERLINK].

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Author contributions

O.I. and O.Y. conceived the initial idea and design. O.I. wrote the manuscript which was revised by all three authors. [O.I. collected and analyzed the data. All authors had access to the data and approved the final version.]

Competing interests

The authors declare no competing interests.

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