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# Religiosity and Trust

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# Religiosity and Trust

Thair Ahmad M. D. and Deepti Goel



**Abstract:** *We elicit data on individual religiosity using a survey, and on trust and trustworthiness using a standard trust game. We do not find conclusive evidence to support that religiosity predicts trust, but we find that more religious people are more likely to exhibit greater trustworthiness. While our analysis is not causal in nature, we summarize existing causal literature that examines the link between religiosity and trust in the South-Asian context, and collate some interesting findings.*

**Keywords:** *Trust Game; Religiosity; India*



# Religiosity and Trust<sup>1</sup>

Thair Ahmad M. D. and Deepti Goel

## 1. Introduction

Trust forms the basis of many economic interactions: employers trust employees to work sincerely even when there is no supervision, individuals lend money without always resorting to formal contracts, and shopkeepers extend credit in good faith believing that their customers will eventually pay up. For trust to perpetuate and continue to underpin such interactions, its recipients need to reciprocate in a manner that is expected of them, i.e., they need to exhibit trustworthiness. The role of trust in the economic sphere is even more significant in India given her largely informal economy, and costly and time-consuming legal systems. This makes it especially important to understand the factors that influence trust and trustworthiness in India.

In this paper, we conduct a study in one Indian city to examine whether religiosity can be a marker of trust, and trustworthiness. Many factors, ranging from individual traits, group identities and institutions, such as a well-functioning judiciary, could potentially influence trusting behaviour. In this paper, we focus on religiosity as most religions and religious texts prescribe prosocial behaviour, including a higher capacity to trust others, and to exhibit greater trustworthiness. At the outset, it is important to highlight our use of the word religiosity. By religiosity, we mean an individual's personal orientation towards the more experiential aspects of religion, irrespective of the religious group they identify with. We construct a measure of an individual's religiosity using survey responses to an inventory of questions (discussed in detail later).

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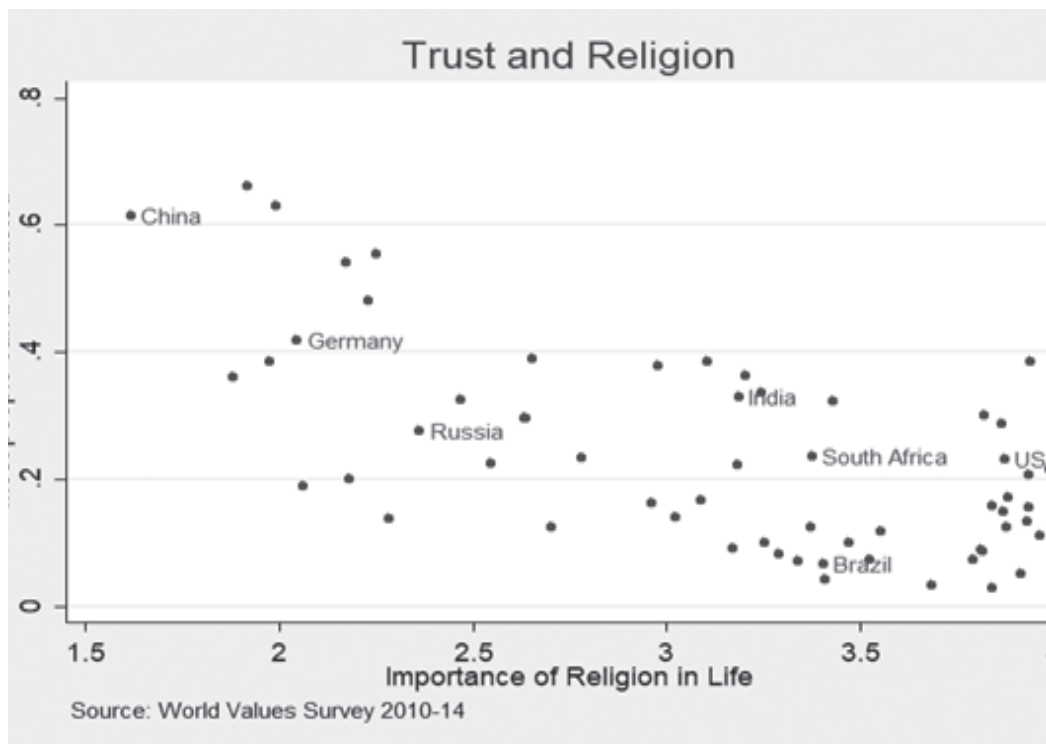
Following much of the economics literature (Fehr, 2009; Naef and Schupp, 2009), our definition of trust is based on Coleman's characterization of trust (Coleman, 1990). He defines trust in terms of behaviour as opposed to a personality trait. According to him, an individual (trustor), trusts another (trustee), if he/she freely transfers resources to the trustee without any formal commitment and without any means to control the trustee's actions. Additionally, the trustor has an expectation of being better off having trusted, than not having done so. This definition allows us to measure trust (and trustworthiness) using the standard trust game (Berg, Dickhaut and McCabe, 1995) commonly used in behavioural economics. Compared to asking subjective questions that may suffer from priming effects (Bertrand and Mullainathan, 2001; Chandon, Morwitz and Reinartz, 2005; Funk, 2016), using the trust game is a more objective way of measuring behaviour as incentive compatible mechanisms, inbuilt in the game, elicit truth-telling by participants.

Figure 1 is constructed using data from the World Values Survey (Inglehart et al., 2014). It shows a country level scatter between individuals' 'ability to trust most people' and 'the importance of religion in (their) life'. Interestingly, the plot suggests a small negative correlation between the two (-0.15, significant at the 1 percent level). It also shows that there is wide variation across countries: China combines high trust and low religion,<sup>22</sup> Brazil has low trust and high religion, and India lies in between the two. In fact, analysed separately, India shows a small positive correlation (0.05, significant at the 10 percent level). This variation suggests that the relationship between religiosity and trust must be studied within the social, economic, political, and cultural context of the place. The importance of context is further highlighted by Chuah, Fahoum and Hoffman (2013), Delavande and Zafar (2015), Gupta et al. (2018), and Tan and Vogel (2008) who study trusting behaviour in different countries and arrive at interesting contextual specific insights on the causal relationship between religion/religiosity and trust (we document their findings later in the paper). Our study is set in one Indian metropolitan city. India, as a whole, is characterized by its distinct religious and cultural context. It is predominantly Hindu, with Muslims being the largest religious minority, and is highly fractionalized (Fearon, 2003). The country is also economically, linguistically, and culturally heterogeneous. Given this diversity, our findings may not generalize to all of India, but nonetheless, we shed light on the relationship between religiosity and trust from a relatively understudied country.

Our main objective is to examine whether individuals who self-report as being higher on a measure of religiosity, also demonstrate a greater capacity to trust, and to be worthy recipients of the trust. The interesting thing about the relationship between religiosity and trust is that, despite religion and religious text advocating prosocial behaviour, existing literature does not find a strong link between the two (see Hoffman, 2013 for an overview). As most of this literature is set in the West, it is worthwhile to study whether this holds true in the Indian city where we conduct our study.

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2 It is a characteristic of communist countries, such as China, to report low stated values for the importance of religion. These reported values most likely underestimate the true importance of religion in peoples' lives.



**Figure 1: Relationship between trust and religion across countries**

Additionally, we also examine whether individuals' preferences and beliefs can explain their behaviour regarding trust and trustworthiness. Specifically, we examine whether their appetite for risk, betrayal aversion, altruism, and beliefs regarding other's trustworthiness can predict trust and trustworthiness. Linking these economic primitives to behaviour is standard in economics (Fehr, 2009; Naef and Jurgen, 2009), and we follow this approach to untangle trust in terms of these primitives.

We do not find conclusive evidence to support that religiosity predicts trust, but we find that more religious people are more likely to exhibit greater trustworthiness. We would like to emphasize that this does not say anything about the *causal* relationship between religiosity and trust. Although we use an experimental game to measure trust and trustworthiness, we don't have control and treatment groups in our design, thus pre-empting causal claims. This caveat notwithstanding, we provide robust estimates of the correlation between religiosity and trust within homogeneous sub-populations, and our measure of trust does not suffer from religious priming effects.

Section 2 presents a brief review of the relevant literature, Section 3 describes the method, Section 4 presents the results, and Section 5 states the limitations of our study and the lessons we learnt from our experience of conducting the game. Finally, Section 6 concludes.

## 2. Literature Review

This review is not exhaustive. It includes select papers from psychology and economics that are most relevant to our work.

Psychologists have a long history of studying the relationship between religiosity and trust. Galen (2012) and Saroglou (2012) are two prominent scholars in the field who take opposing stands on the issue. Galen critiques the hypothesis that there is a causal effect between religiosity and prosocial behaviour, arguing that many of the effects attributed to religious processes can be explained by stereotype projection and in-group favouritism. On the other hand, Saroglou claims that the causation between religiosity and prosocial behaviour is not a fallacy and cannot be simply reduced to the two mechanisms highlighted by Galen.

Hoffman (2013) provides an overview of studies that have used the trust game to study the link between religion and trust. Most of the work he surveys is from the United States (Anderson, Mellor and Milyo, 2010; Benjamin, Choi and Fisher, 2010), and from Europe (Bellemare and Kroger, 2007; Fehr et al., 2003; Tan and Vogel, 2008), with only a few from other parts of the world (Karlan, 2005) from Peru; (Johansson- Stenman, Mahmud and Martinsson, 2009) from Bangladesh). With the exception of Tan and Vogel (2008), who capture religion using a multi-dimensional religiosity index constructed using questions on religious belief, experience and ritual (similar to our approach), other papers cited above capture religion using either religious denomination (Protestant/Catholic/None in most cases) or church attendance. The overwhelming evidence does not point to a strong link between religion and trust.

Tan and Vogel (2008) attempt to understand the causal relationship between religiosity, trust, and trustworthiness among university students in Germany. Here, the trustors are at times (randomly) informed about the religiosity of the trustees. They find that more religious trustees are trusted more, and such behaviour is prominent in more religious trustors. Moreover, more religious trustees are found to be reciprocate more to the trust laid in them, i.e., they are found to be more trustworthy. This last finding resonates in our study as well.

## 3. Methodology

We conducted the study on two sub-samples: 38 student volunteers studying at the Masters level in a liberal arts institution in a metropolitan city in India, and a supplementary sample of 12 volunteers from an elite gated residential community in the same city.<sup>33</sup>

Our method has two aspects: survey questions and the trust game. Unlike standard practice where there is a gap of at least two weeks between the survey and the game so that they don't influence each other, we implemented both in the same sitting. We did this because of logistical constraints

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3 Initially, our plan was to conduct the study on only the student sample. The main reason to include the second sub-sample was to increase sample size as participation from students was lower than anticipated.



that made it almost impossible to meet the same group of participants again. To avoid priming effects of questions on play in the game, and vice versa, we appropriately sequenced the questions and the game.

The study was conducted separately, at a different location, for each sub-sample. All participants were seated in a large room with appropriate spacing between them to dissuade conversation. The entire study was completed in a single sitting of approximately an hour and a half. At the start, a detailed presentation was made on what would follow and the timelines for the same. This included an explanation of the trust game, and an assurance of anonymity and confidentiality regarding survey responses and actions in the game. Appendix 1 presents a copy of the consent form that each participant had to sign before they were allowed to participate in the study.

We binned the survey questions into groups and spread them over the entire study. Appendix 2 provides the complete list of questions, the exact variation of the trust game, and the sequencing of questions and the game. Here, we present an overview of the questions (presented in sequence), and the rationale behind some of the sequencing decisions.

The first set of questions was hypothetical questions about the trust game. They were asked to elicit beliefs about trustworthiness from trustors, and the entire strategy of play from trustees. This was followed by a set of questions designed to capture an individual's trust in others and their economic primitives (betrayal aversion, altruism and risk aversion). Next, the individual's role in the game (trustor/proposer or trustee/responder) was revealed and the trust game was played. This was followed by questions on motivations behind the action in the game, then on socio-demographic characteristics, and finally, a set of nine questions to capture an individual's religiosity.

Responses to questions on willingness to trust and on eliciting primitives could potentially be influenced by play in the game. For example, if the trustor's trust was not reciprocated in the game, their response to the survey question on how much they trusted strangers may be different from how they would have responded had their trust been reciprocated. We, therefore, asked questions about trust and primitives *before* the trust game was played, assuming of course that questions on trust and primitives (and nothing else) will not influence play in the game. Similarly, we asked questions to elicit an individual's religiosity *after* the trust game was played as there is potential for religious priming effects on play in the game. We believe that it is unlikely that play in the game will affect responses to questions on an individual's religiosity.

We ended with a distribution of payoffs in sealed envelopes in such a manner that nobody (including us) knew what each player received.

### 3.1. Trust Game

The trust game as it is commonly played today was introduced by Berg, Dickhaut and McCabe, 1995. It is a two-player (proposer and responder) sequential game. Either only the proposer, or, both the players, are given endowments in the beginning. The proposer chooses to send a part of their endowment to the responder. Whatever is sent is then multiplied by a factor (usually doubled or tripled) and is received by the responder. The responder then chooses to send back a part of what was received to the proposer, and the game ends. The proposer's payoff is the part of his initial endowment that was not sent, plus what was received back from the responder; the responder's payoff is the initial endowment (if any), plus the multiplied amount that was received from the proposer after deducting what was sent back. The subgame perfect game theoretic prediction is that the proposer will not send anything in the first place. In contrast, the Pareto superior outcome for both players in terms of maximizing their payoffs, occurs when the proposer sends the whole endowment, and the responder returns some amount that is more than what was sent. Repeated plays of the game in different contexts reveal that, on average, proposers send half their endowment, and responders send back half of what they receive (Johnson and Mislin, 2011).

In designing the details of the trust game, we closely followed the finding and ideas of Johnson and Mislin (2011) and Hoffman (2013). Here we present the rationale for some aspects of our game design. To eliminate inequality-aversion as the motivation driving the proposers' actions, we decided to endow both proposers and responders equally (instead of endowing only the proposers). To comply with incentive compatibility, we set the average expected payoff at 600 rupees.<sup>44</sup> This is roughly the per day remuneration rate for a Bachelors' student working as a research assistant at the university. Whether this amount is enough to incentivize the elite residential sub-sample is moot, but we could not increase the endowment as we were bound by our budget. To ensure that play in the game is not influenced by factors outside the study environment, such as players acting to preserve their reputation with the experimenter, we followed the double-blind procedure wherein not only the other players, but also the experimenter is unable to trace decisions back to the individual players. To keep the game short and easy to understand, players played only one round of the game in a single role (either as proposer or as responder) and received payoffs according to this single play.

### 3.2. Measuring Religiosity

As stated earlier, we are not concerned with a religious denomination or affiliation (such as Hindu/Muslim/Christian), but with religiosity as defined as a set of beliefs that are inward oriented and focus on the personal experience of religion. Consequently, using a behaviourist approach that measures the outward signs of religiosity, such as self-reports of religious service attendance, religious occupations, and religious donations, will not serve our purpose.<sup>55</sup>

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4 We calculated the average expected payoff assuming the average empirical actions documented in Johnson and Mislin, 2011. Accordingly, if we endow each player with 400 rupees, the proposer sends 200 rupees; the responder receives 600 and sends back 300. The average payoff of the proposer is 500 rupees, and that of the responder is 700 rupees, resulting in an ex-ante expected payoff of 600 rupees for each participant.

5 Moreover, in a country like India with a multitude of religions, comparisons across practices such as service attendance

In their seminal paper, Allport and Ross (1967) developed an improved religious orientation scale (ROS) that aims to measure the extrinsic and intrinsic religious orientation of an individual. Extrinsic orientation captures religious involvement for instrumental or utilitarian reasons such as to socialize, to improve one's status in society, or for self-justification of one's actions, while intrinsic orientation concerns itself with genuine commitment to one's faith demonstrated by an acceptance of, and engagement with, the content of religious doctrine. Our conceptualization of religiosity is more closely related to the concept of intrinsic religious orientation. Several researchers have improved the Allport-Ross ROS Scale since then (Gorsuch and Venable, 1983; Gorsuch and McPherson, 1989; Genia, 1993). Today there is a multitude of inventories that claim to effectively capture the multi-dimensional (belief, ritual, experience and practice) aspect of religiosity and at the same time have good statistical properties (see Hill and Maltby, 2009 for an overview).

In picking a particular scale/inventory to measure religiosity, Hill and Maltby (2009) advise that the following three criteria be kept in mind. First, it should coincide with measuring the researcher's particular conceptualization of religiosity. Second, it should have good psychometric properties, the two most important ones being validity and reliability.<sup>66</sup> And third, the scale should be pertinent to the cultural context to which it would be applied. Guided by these criteria, we used a modified version of the Religious Commitment Inventory-10 (RCI-10). The RCI-10 was developed and validated in Worthington et al. 2003. It is designed to measure the extent to which an individual adheres to their religious beliefs, values, and practices, and whether they utilize them in everyday living. It examines both intrapersonal religious commitment (6 items) and interpersonal commitment (4 items). Worthington et al. claim that RCI-10 measures religious commitment outside of a specific religious tradition. This aspect is particularly useful as the university where we conducted the study seeks to have religious diversity; using a scale that is not tied to a particular religion is, therefore, most appropriate. Appendix 3 presents the modified version of RCI-10 that we used along with the rationale for the modifications made.

## 4. Results

First, we present some summary information on the participants, their responses to select survey questions, and their actions in the trust game. This is followed by the main findings using regression analysis.

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is problematic: while Islam and Christianity emphasize Friday prayers and Sunday service, respectively, there is no such equivalent practice in Hinduism.

6 Validity refers to the property that the scale should measure the concept you want it to measure, while reliability refers to whether all questions in the inventory measure the same concept.

#### 4.1 Descriptive Information

Table 1 shows select characteristics of the two sub-samples, university and elite residential society. It is clear that the two samples are very different in terms of age, annual family income, caste, and religion. Specifically, the university sample is younger, poorer, has a higher share of lower caste, and exhibits greater religious diversity.

Within all subjects, such an alignment between the curricular expectation and the Learning Outcomes for different classes can be found.

<b>Table 1: Study Participants</b>			
	<b>University</b>	<b>Residential Society</b>	<b>Full Sample</b>
<b>No of Participants</b>	38	12	50
<b>Age Range (in years)</b>	20-48	32-67	20-67
<b>Average Age (in years)</b>	24.4	43.4	28.9
<b>Gender (% female)</b>	55.3	58.3	56.0
<b>Share with annual family income</b>			
<b>less than 1 lakh (in %)</b>	7.9	0	6
<b>Share with annual family income</b>			
<b>of 5 lakh or more (in %)</b>	50.0	91.7	60.0
<b>Caste (in %)</b>			
SC/ST	5.3	0.0	4.0
OBC	18.4	0.0	14.0
Brahmin	15.8	58.3	26.0
General (non-Brahmin)	44.7	33.3	42.0
Cannot say	15.8	8.3	14.0
<b>Religious Group (in %)</b>			
Atheist	18.4	0.0	14.0
Agnostic	13.2	8.3	12.0
Hindu	31.6	75.0	42.0
Sikh	0.0	0.0	0.0
Jain	0.0	0.0	0.0
Buddhist	2.6	0.0	2.0
Muslim	15.8	0.0	12.0
Zoroastrian	0.0	0.0	0.0
Christian	7.9	0.0	6.0
None of the above	10.5	16.7	12.0

Table 2 presents the distribution of responses by sub-sample for the survey questions on trust, primitives and religiosity. The university sample is less trusting of strangers and less risk averse. In terms of the religiosity questions, there is no simple pattern that is observed.

<b>Table 2: Responses to Survey Questions on Trust, Primitives and Religiosity</b>			
	<b>University</b>	<b>Residential Society</b>	<b>Full Sample</b>
<b>Trusting Behaviour</b>			
Trust strangers:			
% reported 3 or above on a 4-point scale	29.0	58.3	36.0
<b>Primitives</b>			
Will take revenge for serious wrong:			
% reported 3 or above on a 4-point scale	21.1	16.7	20.0
Will offend back:			
% reported 3 or above on a 4-point scale	23.7	16.7	22.0
Ever volunteered for social service:			
% reported yes	76.3	66.7	74.0
Person fully prepared to take risks:			
% reported 6 or above on a 11-point scale	63.2	41.7	54.0
<b>Religiosity Questions</b>			
% reported 3 or above on a 4-point scale			
Often read books/magazines/websites about my faith	26.3	33.3	28.0
Make/will make financial contributions to my religious organization	11.1	16.7	20.0
Enjoy spending time with others of my religious affiliation	55.3	50.0	54.0
Religion answers many questions about the meaning of life	34.2	50.0	38.0
Religious beliefs lie behind my whole approach to life	36.8	41.7	38.0
Enjoy spending time with others of my religious affiliation	15.8	33.3	20.0
Important to spend time in private religious thought and reflection	26.3	41.7	30.0
Enjoy working in the activities of my religious affiliation	15.8	0.0	12.0
Participate in festivals/perform rituals pertaining to my religion	34.2	33.3	34.0

Table 3 presents statistics from responses to hypothetical questions to elicit the strategy set in the trust game and from an actual play of the trust game. Trust is proxied by the amount sent by proposers, and trustworthiness by the amount sent back by responders. Given an initial endowment of 10 points (1 point is equal to 40 rupees) to each participant, the average amount sent by the proposers is 5.5, and the average amount sent back by the responders is 9.2. If actual play exactly followed the empirical averages documented by Johnson and Mislin (2011), these figures would have been 5 and 8.3, respectively.<sup>77</sup>

<sup>7</sup> There were two proposers who when answering questions to elicit trustworthiness of the responder, stated amounts greater than what was received by the responder. This could be a reflection of deliberate sabotage, lack of understanding, or carelessness by these participants. We have not removed them from the analysis that follows.

Table 3: Play in the Trust Game (in points: 1 point = 40 rupees)			
	University	Residential Society	Full Sample
Proposers' average belief of trustworthiness	7.7	10.8	8.5
Responders' average willingness to reciprocate	8.8	10.4	9.1
Average amount sent by proposers	5.2	6.8	5.5
Average amount sent back by responders	7.7	15.4	9.2
Average payoff to proposers	12.0	19.2	13.7
Average payoff to responders	18.2	14.5	17.3

## 4.2. Main Findings

The main findings are based on a set of ordinary least squares regressions. Separate regressions are run for proposers and responders. Each regression has the following basic specification:

$$Y_i = \alpha_0 + \beta_1 \text{Religiosity}_i + \beta_2 X_i + \varepsilon_i \quad (1)$$

where:  $i$  stands for either the  $i^{\text{th}}$  proposer or the  $i^{\text{th}}$  responder;  $Y$  for either the amount sent by proposer or the amount returned by responder in actual play of the trust game; *Religiosity* is a measure of individual's religiosity level calculated as the sum of responses to the questions in the modified version of RCI-10;  $X$  is a set of controls and consists of the individual's gender, age, caste, income and sub-sample (university or residential).  $\varepsilon$  consists of all unobserved factors that influence behaviour in the trust game.

The coefficient estimates for religiosity are shown in Table 4 below. We use three measures of religiosity: the first takes into account all 9 questions in the modified version of RCI-10, the second excludes question 9 that captures ritualistic practice and was added by us to the original inventory, and the third uses only 5 of the 9 questions (questions 1, 3, 4, 5, and 7), that most closely relate to our conceptualization of religiosity in terms of intrinsic beliefs. The table shows two sets of regressions. The regressions in Panel A control for the individual's gender, age, income, caste, and whether they belong to the university sub-sample. Panel B additionally controls for whether the individual is Hindu or not. As can be seen, we cannot unambiguously conclude that religiosity has predictive power for trusting behaviour, but we find that it positively predicts trustworthiness.<sup>88</sup>

<sup>88</sup> We also carried out an additional specification where we included religion as a categorical control variable (in the data the categories are atheist, agnostic, Hindu, Buddhist, Muslim, Christian, None of the above), instead of a binary variable (Hindu versus non-Hindu). In this specification, the coefficients on all three religiosity measures were insignificant. We hypothesize that this is because there is substantial overlap between the religiosity measure and religious identity captured by the categorical variable leading to imprecise estimates.

However, it would be incorrect to conclude that more religious people are more trustworthy because religiosity and omitted factors from the regression (such as rural/urban background) may be correlated, resulting in a biased coefficient estimates.

<b>Table 4: Relationship between Trust/Trustworthiness and Religiosity</b>				
	<b>A: Dependent Variable (in points)</b>		<b>B: Dependent Variable (in points)</b>	
	<b>Amount sent by Proposers</b>	<b>Amount sent back by Responders</b>	<b>Amount sent by Proposers</b>	<b>Amount sent back by Responders</b>
<b>All 9 religiosity questions</b>	0.329*	0.568**	0.325	0.559**
	(0.174)	(0.235)	(0.196)	(0.243)
	[0.643]	[0.653]	[0.643]	[0.654]
<b>All except ritualistic practice</b>	0.339	0.654**	0.333	0.645**
	(0.194)	(0.250)	(0.218)	(0.257)
	[0.621]	[0.668]	[0.622]	[0.669]
<b>Only 5 pertaining to religious belief</b>	0.37	0.896**	0.38	0.883**
	(0.215)	(0.357)	(0.264)	(0.386)
	[0.607]	[0.656]	[0.608]	[0.662]
<b>Sample size</b>	25	25	25	25
Controls in Panel A include gender, age, income, caste, university dummy; Panel B additionally controls for whether the individual is Hindu or not. Robust standard errors in parentheses. R-squared in square brackets. * p<0.05, ** p<0.01, *** p<0.001				

In Appendix 4, we look at self-reported motivations for action in the game. It supports the well-established result in behavioural economics that simple own-utility maximization cannot explain all human behaviour.

Next, we examine whether select economic primitives, specifically, the appetite for risk, betrayal aversion, altruism, and beliefs regarding other's trustworthiness can predict behaviour in the trust game. To accomplish this, we replace the religiosity measure in equation (1) with our measures of these primitives as gleaned from the survey questions. Table 5 presents the coefficient estimates for various primitive measures and shows that none of them have any predictive power.

<b>Table 5: Relationship between Trust/Trustworthiness and Primitives</b>		
	<b>Dependent Variable (in points)</b>	
	Amount sent by Proposers	Amount sent back by Responders
<b>Take Revenge</b>	-0.874	2.830
	(2.208)	(2.517)
<b>Offend Back</b>	0.030	-1.823
	(1.013)	(1.566)
<b>Volunteered</b>	2.708	0.103
	(3.282)	(4.121)
<b>Appetite for Risk</b>	0.477	-0.467
	(0.518)	(1.302)
<b>Belief about trustworthiness</b>	-0.194	
	(0.511)	
	[0.658]	[0.525]
<b>Sample size</b>	25	25
Controls include gender, age, income, caste, university dummy;		
Robust standard errors in parentheses. R-squared in square brackets.		
* p<0.05, ** p<0.01, *** p<0.001		

## 5. Limitations and Lessons for Future Experiments

We list some limitations of our study and also share aspects of our experience so that future work can avoid some of the obstacles we faced and improve the robustness of their findings.

### 5.1. Small sample size

Even to infer the partial correlations between religiosity and trusting behaviour is problematic because our overall sample size is small. Though we have 50 participants, the effective sample size is halved because we analyse proposers and responders separately. Unfortunately, for each sub-sample, we ended up conducting the experiment on a day when potential participants were otherwise occupied, resulting in low participant turnout. It would be worthwhile to invest in finding out the calendar of events of the target subjects, so as to pick a day when potential participants are likely to be available in large numbers.



## *5.2. Priming biases*

The hypothetical questions on beliefs about trustworthiness were only asked of the proposers, and the questions on willingness to reciprocate were only asked of responders. Although their role in the game (proposer or responder) was not revealed at this stage, some participants may have correctly anticipated this which was not our intent at all. While this may not have necessarily clouded their responses, as far as possible, survey questions should be symmetrically designed for all participants, irrespective of their roles in the game. This may increase the interaction time with participants but may be worth it in terms of reducing priming biases. Second, we did not delink the survey questions and the play of the game due to logistical issues. This is non-standard in the experimental literature. Holding them separately on two different days, with sufficient gap between them, may have helped to mitigate priming biases.

## *5.3. Reducing cost*

We used oTree studio and Heroku to design and run the experiment. Both these are paid subscriptions and one may want to explore other platforms such as Google forms and ClassEx for survey-based experiments.

## *5.4 Mock rehearsals*

Before we ran the study with actual participants, we conducted two mock rehearsals using voluntary participants but adhering to the same protocols as for the final study. Both of these turned out to be very helpful in terms of identifying potential bottlenecks and understanding logistical issues at various stages, right from the seating of participants, sequencing of phases, and distribution of payoffs. Consequently, we could plan better and improve our practices to ensure that the experimental protocol is not compromised. We highly recommend the use of mock rehearsals which should be considered an integral part of the conduct of any behavioural experiment.

## **Conclusion**

Using survey questions and the standard trust game we studied the relationship between religiosity and trust, and also between religiosity and trustworthiness. We do not find conclusive evidence to show that religiosity predicts trust, but we do find that more religious people are more likely to be trustworthy. An important caveat is that our results cannot be interpreted as causal in nature.

Thus, it seems that the weak link between religiosity and trust, seen in many other contexts, holds good in our setting as well. In this study, we avoided making participants conscious about their religiosity by asking questions on religiosity after the trust game was played. Many other studies have documented a positive link between religiosity and trust in the presence of religious priming. Perhaps, the influence of religiosity on trust comes from this priming of religiosity and is muted otherwise. On the other hand, in our study, religiosity positively correlates with trustworthiness even when religiosity was not highlighted. This resonates with the results in Tan and Vogel 2008, who undertake a causal analysis to study the link between religiosity and trust.

We end with a presentation of some experimental studies conducted in South Asia that have examined the causal link between religiosity/religion and trust using trust games. Chuah et al. (2013) examine if India's high fractionalization is associated with mistrust between Hindus and Muslims, the two largest religious communities. They find evidence of inter-group bias wherein both Muslims and Hindus send less to responders of a different religion than to responders of their own religion. Delavande and Zafar (2015) examine the behaviour of Madrasa (Islamic religious seminary) students who display high levels of religiosity vis-à-vis students from less religiously oriented educational institutions in Pakistan. They find that the Madrasa students exhibit higher levels of trust irrespective of the group identity of the matched students, and they over-estimate the trustworthiness of other students, while other groups under-estimate the trustworthiness of Madrasa students. Gupta et al. (2018) ran a field experiment in Bangladesh and the bordering state of West Bengal in India to examine how religious identity and relative (majority or minority) status affect intra- and inter-group interactions. They find that irrespective of religious identity, the minority group (Muslims in India and Hindus in Bangladesh) shows positive in-group bias in trust, and the majority group shows positive out-group bias in trustworthiness. Interestingly, it is the more religious within the minority group, and the less religious within the majority group that drive this behaviour. Johansson-Stenman, Mahmud and Martinsson (2009) conduct their experiment in rural Bangladesh and find no evidence of religious identity (Hindu or Muslim) on inter-religion trust and trustworthiness. This is consistent with Gupta et al.'s finding that religion per-se cannot explain behaviour in the trust game. We hope that inspired by these interesting findings more experimental research will be conducted in the South Asian context to study the causal relationship between religiosity and pro-social behaviour in general.

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## Appendix 1: Consent form

**Instruction at the start: Please be seated and maintain complete silence. If you have a question, raise your hand and one of us will assist you.**

### Consent Form

I am requesting you to participate in a research study for my Bachelors Honors Thesis at Azim Premji University. This form is designed to give you information about this study and receive your formal consent to participate in it.

**Principal Investigator (myself):** *Mohammed Thair Ahmad*  
*School of Liberal Studies, Azim Premji University.*

**Faculty Advisor:** *Deepti Goel*  
*School of Liberal Studies, Azim Premji University.*

### What is the study about?

The purpose is to understand human behaviour using an experiment, called the ‘Trust game’ (described in detail below).

### What will we ask you to do?

Our whole interaction with you should take about 1.5 hours. The game will be played on your mobile phone/laptop for which you would have to download an application from the internet and follow the instructions given. You will also be answering a bunch of questions throughout the game.

#### *Description of the Trust Game:*

A play of the game involves two players, proposer and responder.

**Both players receive an initial endowment of 10 points or 400 rupees from us (1 point = 40 rupees).**

*Here is how the game is played:*

- The proposer first decides to send a part of the endowment to the responder. The proposer can choose to send nothing, all, or a part of the 10 points he/she has.
- We then triple this amount, and the responder receives the tripled amount.
- The responder then sends back nothing, all, or a part of the tripled amount to the proposer.
- The game then ends and the players receive their payoffs according to the points they have in the end.

A few examples of possible plays are given below. This is not an exhaustive list but will help to illustrate the strategic interactions involved. Please make sure you understand all three examples as that will help you play the game more meaningfully.

#### *Example 1*

Proposer and responder each receive 10 points from us.

Proposer sends 4 points to the responder.

Responder receives  $4 * 3 = 12$  points, of which responder sends back 5 points to the proposer.

Game ends.

Proposer accumulates  $10 - 4 + 5 = 11$  points and responder accumulates  $10 + 12 - 5 = 17$  points.

Proposer therefore takes home  $11 * 40 = 440$  rupees and responder takes home  $17 * 40 = 680$  rupees.

#### *Example 2*

Proposer and responder each receive 10 points from us.

Proposer sends 0 points to the responder.

Responder receives  $0 * 3 = 0$  points, of which responder sends back 0 points to the proposer.

Game ends.

Proposer accumulates  $10 - 0 + 0 = 10$  points and responder accumulates  $10 + 0 - 0 = 0$  points.  
Proposer therefore takes home  $10 * 40 = 400$  rupees and responder takes home  $10 * 40 = 400$  rupees.

#### *Example 3*

Proposer and responder each receive 10 points from us.

Proposer sends all 10 points to the responder.

Responder receives  $10 * 3 = 30$  points, of which responder sends back 20 points to the proposer.

Game ends.

Proposer accumulates  $10 - 10 + 20 = 20$  points and responder accumulates  $10 + 30 - 20 = 20$  points.

Proposer therefore takes home  $20 * 40 = 800$  rupees and responder takes home  $20 * 40 = 800$  rupees.

The software will randomly assign a role to you, either as a proposer or as a responder. It will also randomly pair you with another participant assigned the opposite role. All participants are students of XYZ University who, like you, volunteered to play the game.

Expected times for completion of various aspects:

- Explaining the game and instructions for play: 40 minutes
- Playing the game and answering the questions: 30 minutes
- Distributing the pay-offs: 20 minutes

#### **Risks and discomforts**

We do not anticipate any risks from participating in this research.

#### **Payment for participation**

You will be given 10 points i.e., 400 rupees as initial endowment. Your final take-home amount may vary from the initial endowment depending on the play of the game as described above.

#### **Privacy/Confidentiality**

No one, including me, will be able to associate you with your specific role, action, or payoff in the game. Neither would anyone be able to match you with your survey responses. In other words, if tomorrow I or my assistants happen to meet you in the corridor, we would perhaps remember that you were a participant in the experiment, but we will never be able to match you with your actions in the game or with your survey responses.

This is accomplished by identifying each participant not by their name but by a two-digit code. No names or other personal identifiers such as admission numbers will be collected at any point during this experiment.

#### **Please note that taking part in the experiment is completely voluntary.**

*You may decide not to participate before the experiment begins, discontinue at any time, or skip any questions/procedures that may make you feel uncomfortable, with no penalty to you, or on your academic standing, record, or relationship with the university or other organization or service that may be involved with the research.*

*However, payoffs from the game, including the initial endowments, will only be given if you completed the experiment as per the instructions given.*

Please ask any questions you have now.

If you have questions later, you may contact me, Thair, at [m.thairahmad17ug@apu.edu.in](mailto:m.thairahmad17ug@apu.edu.in), or my faculty advisor Deepti Goel, at [deepti.goel@apu.edu.in](mailto:deepti.goel@apu.edu.in)

You will be given a copy of this form to keep for your records.

**Statement of Consent**

I have read the above information, and have received answers to any questions I asked. I consent to take part in the experiment. I am aware that the data collected will be deposited with Azim Premji University.

**Your Signature** \_\_\_\_\_ **Date** \_\_\_\_\_

**Your Name (printed)** \_\_\_\_\_

Signature of person obtaining consent \_\_\_\_\_ Date \_\_\_\_\_

Printed name of person obtaining consent \_\_\_\_\_ ; Mohammed Thair Ahmad \_\_\_\_\_

*This consent form will be kept by the researcher for at least two years beyond the end of the study.*

Note: A similar consent form was used for the residential sub-sample.

## Appendix 2

### Sequencing of survey questions and the Trust game

The exact sequencing of questions and the experiment was as follows:

1. Participants were explained the trust game, assured anonymity and confidentiality, including the fact that no one, including us, would know the role (whether proposer or responder) or action of any individual player. They were told that all we would know is the distribution of actions and payoffs. Participants were asked to sign a consent form (see Appendix 1), stating that their participation is voluntary. No trial rounds were played, but the consent form gave detailed explanation about the trust game along with examples of play. The examples were selected carefully to cover a wide range of play so as not to bias the players.

Here is a brief description of the trust game that was played. A play of the game involved two players, a proposer and a responder. Both players received an initial amount of 10 points from us (1 point = 40 rupees).

- a. The proposer first decided to send a part of the initial amount to the responder. The proposer could choose to send nothing, all, or a part of the initial amount.
  - b. We then tripled the amount sent, and the responder received the tripled amount.
  - c. The responder then decided to send back nothing, all, or a part of the tripled amount to the proposer.
  - d. The game then ended and the players received their payoffs according to the points they had.
2. Participants were then asked hypothetical questions about the game to elicit beliefs about trustworthiness from proposers, and the entire strategy of play from responders. At this stage, players had not been told their specific role in the game and the scenarios were presented as hypothetical.
  3. Next, survey questions were asked to elicit players' self-reported tendencies to trust, and to measure their primitives. These are given below. The first three are marked on a scale of 4, and, following Dohmen et al. 2011, the question on risk is on a 11-point scale:
    - i. How much do you trust strangers you meet for the first time?
    - ii. If you suffer a serious wrong, you will take revenge as soon as possible, no matter what the costs.
    - iii. If someone offends you, you will also offend him/her.
    - iv. Have you ever volunteered for social service activities outside of course requirements or outside of reasons for career advancement? Yes/No
    - v. Are you, generally speaking, a person who is fully prepared to take risks, or do you try to avoid taking risks?

Question i. is our survey question on trust, questions ii. and iii. are intended to measure betrayal aversion, question iv. is to capture altruism, and question v. is to capture appetite for risk.

4. Next, the players were revealed their roles and the game was played. After each player's action, he/she was asked a few questions on motivations behind their action. For each motivation, the player was asked to mark its importance in explaining their action in the game, on a scale of 1 to 4.

For proposers the set of motivation questions was:

- i. You sent this amount because you believe that the responder is trustworthy and will send back enough to compensate you.
- ii. You sent this amount because you believe that the responder is untrustworthy and will not send back enough to compensate you.
- iii. You sent this amount because you like taking risks for a possibility of higher return.



- iv. You sent this amount because you do not like taking risks even if they may bring higher returns.
- v. You sent this amount because you do not want to be let down by receiving back very little from the responder.
- vi. You sent this amount because you are a generous person and believe in sharing.
- vii. You sent this amount because you would like everyone to get an equal share of the pie.
- viii. You sent this amount because you would like to maximize the pool of potential resources that can be shared.

For responders the set of motivation questions was:

- i. You sent this amount because you felt the need to reciprocate to the trust that the proposer showed toward you.
  - ii. You sent this amount because you felt that the proposer did not trust you enough.
  - iii. You sent this amount because you are a generous person and believe in sharing.
  - iv. You sent this amount because you want to maximize your gain and do not believe in sharing.
  - v. You sent this amount because you would like everyone to get an equal share of the pie.
5. Next, the players got to see their own payoffs. They could of course calculate their own payoff and that of their paired partner, but the latter was not shown explicitly.
  6. This was followed by the final set of survey questions to capture socio-demographics comprising gender, age, family income (interval coded), caste and religious group; and the set of 9 questions to capture an individual's religiosity (see Appendix 3 for the inventory of questions to measure religiosity).
  7. The experiment ended and players received their payoffs in individually sealed envelopes in a manner that we did not get to know what each player was receiving.

## **Appendix 3: Measuring religiosity**

### **Original Religious Commitment Inventory - 10 (RCI-10)**

Read each of the following statements. CIRCLE the response that best describes how true each statement is for you.

1. Not at all true of me
  2. Somewhat true of me
  3. Moderately true of me
  4. Mostly true of me
  5. Totally true of me
1. I often read books/magazines/websites about my faith.
  2. I make financial contributions to my religious organization.
  3. I spend time trying to grow in understanding of my faith.
  4. Religion is especially important to me because it answers many questions about the meaning of life.
  5. My religious beliefs lie behind my whole approach to life.
  6. I enjoy spending time with others of my religious affiliation.
  7. Religious beliefs influence all my dealings in life.
  8. It is important to me to spend periods of time in private religious thought and reflection.
  9. I enjoy working in the activities of my religious affiliation.
  10. I keep well-informed about my local religious group and have some influence in its decisions.

Items 1, 3, 4, 5, 7, and 8 make up the Intrapersonal Religious Commitment subscale; items 2, 6, 9, and 10 make up the Interpersonal Religious Commitment subscale. The scoring is straightforward and simply involves adding the scores on each item.

### **Modified version of RCI-10 used in this study**

Here are 9 statements to help us understand how religious you are. Please select from a scale of 1 to 4, depending on how closely you identify with each statement.

1. Not at all true of me
  2. Slightly true of me
  3. Moderately true of me
  4. Totally true of me
1. I often read books/magazines/websites about my faith.
  2. I make (or will make when I start earning) financial contributions to my religious organization.
  3. I spend time trying to understand my faith.
  4. Religion is especially important to me because it answers many questions about the meaning of life.
  5. My religious beliefs lie behind my whole approach to life.
  6. I enjoy spending time with others of my religious affiliation.
  7. It is important to me to spend periods of time in private religious thought and reflection.
  8. I enjoy working in the activities of my religious affiliation.
  9. I participate in festivals/ perform rituals (such as visiting temple, church, gurudwara, mosque; fasting on certain days) pertaining to my religion.

**Rationale for modifications to the original RCI-10**

1. We moved to a 4-point scale to maintain uniformity with the rest of the questionnaire.
2. We removed number 7. from the original RCI-10 as we felt it was very similar to number 5.
3. We removed number 10 from the original RCI-10 as it is not so relevant to students.
4. We inserted new number 9 to capture behavioural aspects of religion.
5. Phrasing of some of the statements (1.,2., and 3.) was changed to simply the language and/or make it more suited to students.

Religiosity of an individual participant is constructed by summing up the responses to the modified version of RCI - 10.

## Appendix 4: Motivations for action in the game

In this appendix we look at self-reported motivations for action in the game. Appendix 2 provides a full wording of survey questions used to elicit these motivations. Table A4.1 presents the distribution of responses. Among the proposers, the motivation that recorded the maximum votes was that proposers wanted to maximize the size of the pie: 72 percent of the proposers reported that they sent the amount they did to maximize the pool of potential resources. Among the responders, there was a tie between feeling the need to reciprocate and wanting everyone to get an equal share of the pie, both at 72 percent.

Table A4.1: Responses to Survey Questions on Motivations behind Action in the Game		
Share who reported 3 or above on a 4-point scale (in %)	Proposer	Responder
Believed responder is trustworthy	60.0	
Believed responder is untrustworthy	20.0	
Like taking risks	48.0	
Do not like taking risks	24.0	
Do not want to be let down	44.0	
Am a generous person	52.0	
Would like everyone to get an equal share	68.0	
Would like to maximize the pool of potential resources	72.0	
Felt the need to reciprocate		72.0
Felt that the proposer did not trust you enough		20.0
Am a generous person and believe in sharing		52.0
Want to maximize my gain and do not believe in sharing		20.0
Would like everyone to get an equal share of the pie		72.0

# Notes

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# Notes

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## About the Authors

### **Thair Ahmad M. D**

Thair Ahmad M. D. is a Master of Economics student at Azim Premji University, Bengaluru, India. His areas of interest include experimental economics, development economics, and history of economic thought. He is currently working on a history of economic thought project looking at the relationship between relative prices and general price level for his master's dissertation.

### **Deepti Goel**

Deepti Goel is an Associate Professor at the School of Arts and Sciences and a faculty fellow at the Centre for Sustainable Employment, both at Azim Premji University, Bengaluru, India. Her main areas of research are Applied Econometrics, with a specialization in Impact Evaluation, and Labor Economics. Some of her recent/ongoing work is on measuring teacher quality in Delhi's public schools; understanding how social identity in terms of gender, caste and religion, plays out in the labour market; and how survey quality may be improved using para data, i.e., data on the data collection process. Deepti is also a research fellow at IZA-Institute of Labor Economics, and at Global Labor Organization (GLO).



## ***About Azim Premji University***

Azim Premji University was established in Karnataka by the Azim Premji University Act 2010 as a not-for-profit University and is recognized by The University Grants Commission (UGC) under Section 22F. The University has a clearly stated social purpose. As an institution, it exists to make significant contributions through education towards the building of a just, equitable, humane and sustainable society. This is an explicit commitment to the idea that education contributes to social change. The beginnings of the University are in the learning and experience of a decade of work in school education by the Azim Premji Foundation. The University is a part of the Foundation and integral to its vision. The University currently offers Postgraduate Programmes in Education, Development and Public Policy and Governance, Undergraduate Programmes in Sciences, Social Sciences and Humanities, and a range of Continuing Education Programmes.

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