



# Stereotypes and Madrassas: Experimental evidence from Pakistan<sup>☆</sup>



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## ABSTRACT

Little is known about the behavior of Madrassa (Islamic religious seminaries) students, and how other groups in their communities interact with them. To investigate this, we use data from economic decision-making experiments embedded in a survey that we collected from students pursuing bachelors-equivalent degrees in Madrassas and other educational institutions of distinct religious tendencies and socioeconomic background in Pakistan. First, we do not find that Madrassa students are less trusting of others; in fact, they exhibit the highest level of other-regarding behavior, and expect others to be the most trustworthy. Second, there is a high level of trust among all groups. Third, within each institution group, we fail to find evidence of in-group bias or systematic out-group bias either in trust or tastes. Fourth, we find that students from certain backgrounds under-estimate the trustworthiness of Madrassa students.

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## 1. Introduction

Madrassas – Islamic religious seminaries – have received considerable attention recently, especially since 9/11 and the 2005 London bombing. Despite scant research, claims made by policy makers and in the popular press suggest that they may be responsible for fostering militancy, Islamic extremism, international and national terrorism and violence. Madrassas have sometimes been labeled as “weapons of mass instruction” or “factories for global *jihad*”, and as such have been perceived as a threat for the West and for individual countries hosting them (Rashid, 2000; Stern, 2000; Malik, 2008; Rahman, 2008;

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Ali, 2009; Cherti et al., 2011). As a result, the United States has been encouraging Madrassa reform in the Muslim world, particularly in Pakistan where Madrassas are thought to be linked to the Taliban (The 9/11 Commission, 2004; Fair, 2008).<sup>2</sup>

Madrassas are widespread around the world and educate an estimated 6 million Muslims (Haqqani, 2004). In Pakistan alone, some estimates suggest that nearly 2 million students attend Madrassas (Candland, 2008). Many Madrassa graduates go on to play an important religious and political leadership role in their communities (Malik, 2008), and are therefore important social and economic actors. Despite their alleged ties to extremists both nationally and internationally, and the major influence they play in their communities, we know very little about the behavior of young men attending Madrassas, the causal impact of Madrassas in shaping their students' behavior, and how other groups in their communities interact with these students. This is primarily because Madrassas tend to be closed institutions and data on their students is extremely rare. In this paper, we use unique experimental data that we collected from Madrassa students and from students in other educational institutions in Pakistan to investigate how Madrassa students and other members of the Pakistani society interact with each other. The Pakistani setting is particularly well-suited to investigate the behavior of Madrassa students since: (1) Madrassas are a non-trivial player in the educational landscape of the society (Winthrop and Graff, 2010), (2) as we document later, religious institutions are perceived by the general Pakistani population to be playing a major role in cultivating extremism and violence, and (3) the Pakistani society is one that is rife with violence, and polarized along social, religious, and ethnic lines, and where as a result multiple social identities may co-exist.

To better understand how members of the Pakistani society interact with each other, we take an indirect approach and focus on students' interactions in several economic decision-making experiments.<sup>3</sup> These experiments measure trust (trust game), expected trustworthiness (expectations in the trust game), and unconditional other-regarding behavior such as altruism or inequity aversion (dictator game). Trust has been shown to be important for intergroup reconciliation and negotiations (Lichbach, 2005; Nadler and Liviatan, 2006), and to lead to lower levels of militancy (Uslaner et al., 2004). Exhibiting other-regarding behavior may be negatively correlated with exhibiting hatred, which has been proposed to be one of the contributing causes of terrorism and violence (Sternberg, 2003). In addition, trust has also been shown to enhance efficiency and to promote economic growth and financial development (Knack and Keefer, 1997; La Porta et al., 1997; Putnam, 2000; Guiso et al., 2004), especially in a setting like Pakistan where institutions are failing (Ostrom, 1990; Fukuyama, 1995). Our experiments measure aspects that are therefore likely to be important for the decision to engage in violence, and for the well-functioning of a society more generally.

In this setting, we study how Madrassa students, who tend to come from modest origins, exhibit high levels of religiosity, and are thought to be exposed to teachings that reject Western ideas (Rahman, 2008), interact with individuals from diverse religious and socioeconomic backgrounds, and varied exposure to Western ideas. We analyze their interactions with two other disparate groups of Pakistani youth. The first consists of students from Islamic Universities that teach, in gender-segregated campuses, a Liberal Arts curriculum combined with Islamic teachings. The second group comprises of students from Liberal Universities that are similar to American universities – classes are taught in English, campuses are mixed, tuition is expensive, and students are widely exposed to Western ideas. There is substantial sorting on socioeconomic characteristics and very different levels of religiosity and exposure to Western ideas across the institutional settings. We focus on interactions of inter-elite groups, defined as college-level students, because individuals belonging to these groups will eventually become policy makers and dictate future policy, so understanding their behavior is of particular relevance. We chose those three groups (Madrassa, Islamic University, and Liberal University students) since they clearly represent different social and religious identities within Pakistani society and we would therefore expect a priori tensions between them.

We recruited 1521 male students pursuing bachelors-equivalent degrees from (i) four Madrassas, (ii) one Islamic University, and (iii) two Liberal Universities for our study. We randomly matched students with each other to participate in several economic decision-making experiments to analyze how the various groups interact with each other. Each student is, however, matched with only one other student belonging to a specified institution. Our study design allows us to observe differences in decisions both across groups and within group as the institution type of the participant's partner is varied. This enables us to investigate whether there is any systematic difference in behavior by groups – more precisely, whether Madrassa students interact with their peers differently than with others, in particular those who may be perceived to be widely influenced by the West, and whether other groups of the society treat Madrassa students differently. Through our experiment, we seek to clarify five main questions: (1) Does behavior in the trust game vary by group? (2) Do students exhibit an in-group bias and is there differential treatment (discrimination) in terms of behavior against a particular group? (3) Is there taste-based discrimination against a group? (4) Is there systematic difference in expected trustworthiness (stereotype) against a particular group? (5) Are the stereotypes about each group's perceived trustworthiness correct?

Analysis of the experiments reveals several interesting findings. First, there is a high level of trust among all groups, with students enrolled at Madrassas, on average, being amongst those who exhibit the most trusting behavior. Second, for all

<sup>2</sup> The (perceived) dubious role of Madrassas has also been one of the factors prompting the US and the UK to direct large amount of foreign aid to reform the Pakistani education system. For example, between 2002 and 2008, the United States Agency for International Development (USAID) invested over \$682 million to reform Pakistan's education system (Bajoria, 2013).

<sup>3</sup> Results from laboratory experiments that measure social capital and pro-social preferences have been found to be informative about behavior in real-world situations (Karlan, 2005; Benz and Meier, 2008; Baran et al., 2010).

groups, we find *no* evidence of in-group bias or systematic discrimination in the trust game. While we find no difference in trust game behavior by match type (i.e., by the institution of the student with whom the participant is matched), students could still exhibit different levels of trust and preferences toward certain groups as a range of factors may motivate a student's decision-making in the trust game.<sup>4</sup> These include unconditional other-regarding preferences, beliefs about trustworthiness of the partner, and risk preferences (Cox, 2004). We examine these factors by studying how participants' decisions carry over to the dictator game (played by the student with the *same* match). The dictator game allows us to test for differences in unconditional other-regarding preferences (taste-based preferences). Here too, we find no evidence of in-group or systematic out-group bias. But we find that Madrassa students give the most.

We do, however, find important differences in expected trustworthiness across the groups. Our data on subjective expectations – beliefs of how much students think was sent back to their peers, on average, by other students in the matched institution in the trust game – that measure expected trustworthiness reveal that students from Liberal Universities expect Madrassa students to send back less relative to other groups. Moreover, these beliefs held about Madrassa students are statistically very different and lower than the amount that Madrassa students *actually* send back. These incorrect expectations (or stereotypes) could negatively influence the social and economic interactions of those two groups outside of the lab. We also find that Madrassa students have the highest levels of expectations of the trustworthiness of other groups, and they over-estimate the trustworthiness of Liberal University students. Notably, variation in observable characteristics (within institution) is not correlated with the mismatch in expectations regarding trustworthiness.

In summary, our results show that Madrassa students treat all the groups we consider equally, as do students belonging to other groups. Madrassa students, therefore, do not stand out as discriminating against students from institutions with strong Western influence.<sup>5</sup> An important question that follows is whether Madrassa students' pro-social behavior can be attributed to Madrassa attendance or to characteristics that lead students to attend a Madrassa in the first place (i.e., selection). Selection into Madrassas would be an issue only if one believes that students enrolling in Madrassas are even *more* trusting and pro-social prior to entry than levels that we observe. However, given the very high levels of trust and pro-social behavior in the data, this is quite unlikely. Regardless, we argue that the behavior of Madrassa students cannot be explained by selection into Madrassas on *observable* characteristics. While we cannot directly address the extent to which sorting on unobservables may drive our results (due to the lack of credible exogenous variation in Madrassa attendance), such sorting would have to be quite severe to reverse our conclusions. Our findings, overall, cast doubt on the general perception that Madrassas teach hatred and ideological extremism – at least with regards to groups within the Pakistani society – and is consistent with Madrassas promoting religious teachings and offering an environment that emphasizes selflessness.<sup>6</sup>

Our paper shows how distinct groups *within* the Pakistani society interact with each other – something that is crucial for the functioning of the society. Given the current divide of the society, the omnipresent violence, and the perception of the Pakistani general population that religious institutions are playing a role in cultivating violence, our result of equal treatment is quite striking. The findings that Madrassa students show very high levels of pro-social behavior toward *all* groups and are also very trusting cast doubt on the widely-held view that Madrassas (or their students) are primarily responsible for domestic violence. It is important to note that the Madrassas we surveyed are mainstream and in urban centers. Since most Madrassas are similar to the ones in the study and most prominent Madrassas are located in urban centers, our findings would extend to the vast majority of those institutions in Pakistan. Because there is a lot of heterogeneity across geography and ideology, we do not know how our findings would extend to less mainstream Madrassas. However, the fundamental question pertains to the role of Madrassas as an institution. That requires investigating the behavior of mainstream Madrassa students, since they are the ones representative of that institution. Fringe Madrassas are, by definition, not representative of the majority of Madrassas. Therefore, we believe our findings contribute to our understanding of the behavior of Madrassa students. The implications of our results are, however, unclear for the role of Madrassas in international violence, since we do not match students with foreign (particularly, Western) individuals. Thus, we do not know how our results would extend to interactions with groups outside of Pakistan. In addition, one should be cautious in generalizing our results to interactions of less educated or non-Muslim groups in Pakistan.<sup>7</sup>

<sup>4</sup> For example, Liberal University students may invest similarly in the trust game with Madrassa students and students from their own institution. However, the underlying preferences and tastes could be very different. Even if Liberal University students believe Madrassa students are less trustworthy (when compared to students at their own institution), they may invest with them equally because of inequality aversion (since Madrassa students generally hail from poorer socioeconomic backgrounds) or other unconditional social preferences.

<sup>5</sup> Our sample includes Madrassas belonging to the Deobandi and Barelvi schools of thought – the two main interpretive traditions of Sunni Islam. Since Deobandi Madrassas are generally believed to be more militant (Talbot, 2009; Winthrop and Graff, 2010), we test for whether the behavior of Madrassa students differs across the two interpretive traditions: Our analysis reveals no systematic heterogeneity in the behavior of students of the two Madrassa types.

<sup>6</sup> Note, however, that trust and other-regarding behavior need not be the exact opposite of hatred. Only if they are negatively related, would high trust and/or other-regarding behavior mean less hatred.

<sup>7</sup> Focusing on college-level students allow us to isolate the effect of attending different types of institutions (abstracting from the effect of education level) on behavior. With regards to the affect of education on behavior, Helliwell and Putnam (2007) find that increases in average education levels improve trust, while Milligan et al. (2004) find that education leads to increased civic sense. On the other hand, Algan et al. (2011) find that teaching practices (such as lecture versus work group) influence student beliefs about cooperation.

Because of the very distinct social identity of the three groups that we study, our paper fits within the literature that focuses on group identity and behavior.<sup>8</sup> This literature can be divided into two major strands: one that uses induced group membership, and the other that examines the effects of existing groups, such as ethnic groups, clans, and residential groups, on behavior. The first typically finds evidence of a strong impact of group membership on individual behavior (see for, example, Charness et al., 2007; Chen and Li, 2009; Heap and Zizzo, 2009; Sutter, 2009; Benjamin et al., 2010b), while the second shows more mixed results (Fershtman and Gneezy, 2001; Bernhard et al., 2006; Falk and Zehnder, 2007).<sup>9</sup> Our paper uses the latter approach and investigates the behavior of existing groups. Although controlling for selection into groups makes the causal inference of group membership harder to identify (an issue avoided when group membership is randomly induced, and mitigated in our context by using an instrumental variable approach for Madrassa attendance), using existing groups is a valuable approach to understanding the interactions of relevant social and economic actors from a policy and real-world perspective.

With real groups, the impact of group membership on behavior is more varied. For example, Fershtman and Gneezy (2001) match Israeli students with objectively-recognizable ethnic names and find strong evidence of discrimination against Eastern Jews by both Ashkenazic and Eastern Jews in the trust game. Similar results are found in the social psychology literature when groups are unequal, in which case the disadvantaged group often favors the out-group (e.g., Jost et al., 2004; Brown, 2000).<sup>10</sup> While our paper takes a similar approach as Fershtman and Gneezy (2001), our context is made unique by having two dimensions of inequality: religiosity and socioeconomic status, both of which are valued by the Pakistani society.<sup>11,12</sup> Moreover, these two dimensions are negatively correlated: Liberal University students are the highest social status group when judged by socioeconomic characteristics but the lowest status group when judged on the metric of religiosity, and the reverse is true for Madrassa students. This may explain why these two groups trust more and exhibit more other-regarding behavior than the Islamic University students, who fare in the middle on both scales. The interaction between the two dimensions of social status may also explain why we observe no out-group bias from any of the groups.

The paper is organized as follows. We provide background information on Pakistan, Madrassas, and the other groups we consider in Section 2. Section 3 describes the data, sample and experimental procedures, while Section 4 presents the empirical results. In Section 5, we investigate the causal effect of Madrassa attendance on the behavior of Madrassa students. We provide a discussion of our results and concluding remarks in Section 6.

## 2. Background

### 2.1. Pakistan: a segmented society mired in conflict

With a population of 184 million and a GDP per capita of \$2400 (The World Factbook, 2010), Pakistan is a populous and rapidly growing middle income country. Since its inception from the violent partition of India in 1947, Pakistan has been in search of a national identity.<sup>13</sup> To this day, it continues to be segmented along various lines and mired in violent conflict.

The first divide is economic: while an estimated 24% of the population live under the official poverty line, estimates based on a multidimensional poverty index such as financial poverty, illiteracy or children out of school, poor housing and physical household assets show that 54% of Pakistanis live in a state of multiple deprivations (Jamal, 2009). The second divide is religious. Ninety-five percent of the population is Muslim (Sunni 75%, Shia 20%) while the remaining 5% includes Christian and Hindu (The World Factbook, 2010). Moreover, there is also sectarian rivalry within Sunnis between Barelvis, who uphold devotional practices such as elevating Muslim saints, and Deobandis, who seek to eliminate such practices (Talbot, 2009).

In addition to the segmentation highlighted above, another characteristic of today's Pakistan is violence and terrorism. Pakistan had 2670 terrorism-related deaths in 2009, placing it third in a worldwide rank. Terrorism-related incidents are not confined to certain troubled areas, but are widespread across the country. These attacks are attributed to a number of causes: sectarian violence, secessionist movements, backlash effect of the Afghan war ("Kalashnikov culture" and jihad mentality), conflict with India over Kashmir, Islamist insurgent groups and forces such as the Taliban, and the society's segmentation (Talbot, 2009).

<sup>8</sup> The influence of group membership on individual behavior has been widely studied in social psychology (Tajfel et al., 1971), where group identity is induced exogenously by assigning participants to "minimal" groups, which are arbitrary labels such as blue or red group. These studies have found that even ad-hoc and trivial group categorizations typically lead to in-group bias and discrimination against the out-group (Tajfel and Turner, 1986). Since the introduction of identity into economic analysis by Akerlof and Kranton (2000), several economic studies have analyzed the impact of social/group identity and behavior.

<sup>9</sup> A third approach is to use real social groups with random assignment, as in Goette et al. (2006, 2010). This approach is less common because of the difficulty in finding real groups without selection.

<sup>10</sup> Even when groups are induced but unequal, the literature finds that the higher status group gives and trusts more, and that the lower status group favors the higher status group (Butler, 2008; Lei and Vesely, 2010).

<sup>11</sup> Another major difference from the design in Fershtman and Gneezy (2001) is that we directly elicit the respondent's expectations about the trustworthiness of the match. Unless one makes the assumption that players play a social preferences equilibrium in the trust game, data on both expectations about trustworthiness and decision in the dictator game are needed to decompose behavior in the trust game.

<sup>12</sup> Our paper is also related to the theory literature on social distance and social behavior (Akerlof, 1997), and stereotypes (Bordalo et al., 2014).

<sup>13</sup> The various identities coming from religious, regional, and national belonging were articulated about a decade ago by nationalist Wali Khan when he declared himself to have been a Pashtun for 4000 years, a Muslim for 1400 years, and a Pakistani for 40 years (Talbot, 2009).

## 2.2. The Madrassas in Pakistan

A unique feature of this paper is to have data from a large pool of Madrassa students in Pakistan. In recent years, and in particular after 9/11, claims made by US policy makers and the popular press suggest that Madrassas – Islamic religious schools – in Pakistan are responsible for nurturing militancy and violence. Despite popular thinking, there is considerable controversy about the link between Madrassas and militancy (Billquist and Colbert, 2006; Fair, 2008).<sup>14</sup>

Madrassas admit students of all ages, and generally do not have any admission requirements. At earlier levels, students usually learn to read and memorize the Qu'ran. The Madrassa curriculum, at advanced stages, focuses on the *Dars-e-Nizami*, which is taught for 8 years following the completion of elementary school and covers religious sciences (e.g., jurisprudence, the Qur'an and its commentaries) and rational sciences such as Arabic grammar and literature, logic, and rhetoric (Rahman, 2008).<sup>15</sup> The materials for these subjects are texts dating to before the 14th century, and classes are typically taught in Urdu (Fair, 2006; Rahman, 2008). The majority of Madrassas do not impart any secular or vocational training, but they have rigid curricula emphasizing rote memorization, and it has been argued, albeit with scant evidence, that they deliberately educate their students in narrow worldviews and rejection of Western ideas, and do not train them sufficiently for the real world (Ali, 2009).

An important factor in understanding the extent of Madrassas' influence in Pakistan is how many students study in them. The number of Madrassas has undeniably increased, especially in the 1980s during the Soviet war in Afghanistan, when Madrassas were established in Afghan refugee camps to train fighters for the resistance movement (Winthrop and Graff, 2010). However, there is considerable disagreement over the extent of the penetration of Madrassas: Estimates of Madrassas' enrollment vary from less than 1% (Andrabi et al., 2006) to 33% (International Crisis Group Report, 2002) of all enrolled students.<sup>16</sup> One reason why an accurate measure of Madrassa enrollment remains challenging is that few are registered—according to Rashid (2000), less than a third of Madrassas are registered. Recent studies put the enrollment in registered Madrassas in the 1–7% range (Fair, 2008; Pakistan Ministry of Education). Regardless of the source that one choose to favor with regard to Madrassa enrollment, the overall picture indicates that a non-trivial fraction of Pakistani youth study in Madrassas.

A key feature of Madrassas is that they generally tend to be free. In a country with a dilapidated public educational system (Winthrop and Graff, 2010), Madrassas may offer a viable alternative for families unable to afford more expensive private schools (Singer, 2001).

A related important question pertains to how the Pakistani public views the linkage between Madrassas and militancy. Because this is relevant to the context of our study, Appendix A1 discusses the responses to some survey questions administered to the one Islamic University and a random sample in two Pakistani urban centers that were designed to shed light on this. We find suggestive evidence of the general public viewing Madrassas as playing a large role in educating the youth and as being somewhat complicit in militancy and extremism. We also find high levels of support for the government's plan to reform Madrassas that would require them to include secular subjects in the curriculum.

## 2.3. Group identity

We seek to investigate how Madrassa students and other groups of Pakistani youth interact with each other. We focus on groups that vary in socioeconomic characteristics, religiosity, exposure to Western ideas, and type of education they receive.

In our set-up, the "group" is the undergraduate institution where the students study. Our focus is therefore on a highly educated segment of the Pakistani population. Overall, in 2008/2009, 8.3% of the males aged 21 and above had attained at least a Bachelor degree in Pakistan. The rate increases to 14.8% among those currently working in an urban area.<sup>17</sup> The groups we consider are endogenous because families and individuals self-select into schools. We consider three main groups: Madrassas, Islamic Universities, and Liberal Universities.

Madrassas and their curricula have been discussed above: students typically come from modest origins, have limited exposure to Western ideas in school, study in Urdu and base their studies on religious texts. Advanced study within the Madrassas produces an Alim (Islamic scholar and/or teacher). Most students who graduate from a Madrassa go on to work in the religious sector.

Islamic Universities provide a Liberal Arts curriculum combined with Islamic teachings and courses. For example, Economics is taught with a focus on Islamic principles of finance. These universities have segregated campuses for males and females, and classes are taught in Arabic or English. These institutions tend to be public and, therefore, are accessible to low and middle income groups. While they have certain admission requirements, they are relatively easier to get accepted into

<sup>14</sup> According to Winthrop and Graff (2010), while some Madrassas are linked to sectarian militancy, most are non-extremist. Asal et al. (2008) conducted surveys of Pakistani families who had lost a son to militancy in Kashmir and Afghanistan, and concluded that there is no evidence that Madrassas are a principle place for militants' recruitment.

<sup>15</sup> This certification is recognized to be equivalent to a Bachelors or Masters degree by the Ministry of Education.

<sup>16</sup> The large estimate of 33% may be attributed to a mistake in the total number of students enrolled in Pakistan (Fair, 2006).

<sup>17</sup> Source: Authors' computation from the 2008/2009 Pakistan Labor Force Survey.

(relative to liberal universities). A relatively large proportion of students at such universities have typically studied for some time at Madrassas before enrolling.

Liberal Universities – the third kind of institution – are similar to American colleges. They teach a Liberal Arts curriculum in English, and have gender-mixed campuses. Since tuition at such institutions tends to be very expensive, they are generally accessible only to individuals from high socioeconomic backgrounds. In addition, these institutions are quite selective and their entry requirements are such that they primarily accept students who graduate from private high schools (which tend to have higher academic standards and which, in most cases, cater to the rich).

These three groups clearly represent three different identities within the Pakistani society. At one end of the spectrum we have young males from poorer backgrounds who attend religious schools that are thought by many outside of (and to some extent inside of) Pakistan to be linked to militancy and extremism. At the other end of the spectrum we have wealthy students exposed to Western-type education. Our measure of group identity is a measure of both religious identity as well as social class. In this paper, we use the term “identity” for “group affiliation.”

### 3. Data

We conducted experiments in two male Sunni Madrassas from the Bareilvi school of thought, two male Sunni Madrassas from the Deobandi school of thought, one Islamic University (IU), and two liberal Universities, all located in Islamabad/Rawalpindi and Lahore between May and October 2010. The Islamabad/Rawalpindi metropolitan area is the third largest in the country with a population of about 4.5 million. Islamabad, the country’s current capital, was constructed in 1960 adjacent to Rawalpindi, an older city which houses the army’s headquarters. Lahore is the capital of the Punjab province and the country’s second largest city with about 10 million inhabitants. While both are vibrant urban centers, the Islamabad/Rawalpindi metropolitan area is located closer to Afghanistan and the tribal areas, and has greater ethnic diversity compared to Lahore. However, Punjabis are the dominant ethnic group in both metropolitan areas. We focus on two cities for practical reasons for the data collection.

We targeted the largest institutions in each category in each city. Data collection was conducted by the Survey Center (SC) affiliated with the Islamic University.<sup>18</sup> The SC Team approached the schools for consent, and informed them that the study dealt with decision-making and opinions/expectations of Pakistani youth. Furthermore, they notified the schools that the study was being conducted on behalf of an international research organization. A copy of the questionnaire was provided to the contact person of each institution for vetting (however, the contact person could not keep a copy of the questionnaire with them).

The institutions in our sample are among the five largest and best-regarded institutions in the relevant category in that city. Among all the institutions we contacted, one Liberal University and one Madrassa declined participation. We sampled the most senior students in the four Madrassas since they are similar in age to university students, and are pursuing the Madrassa equivalent of a Bachelor degree. Though participation was voluntary, almost everyone in the Madrassas participated in the study. At the other institutions, a random sample of students was selected to participate based on a listing of students provided by the registrar’s office. Average response rate at the universities was about 70%. Data collection took 1–2 days in the Madrassas, and about a week at the other institutions. To signal credibility of the study to the students, members of the staff of the institution at which data was being collected were also hired for the data collection. Overall 1521 male students participated in the experiments.<sup>19</sup> They also answered a questionnaire asking about demographic characteristics, school choice, and attitudes on social issues. Below we describe our sample and the experimental procedure.

#### 3.1. Sample

Table 1 compares the characteristics of the male participants by group (educational affiliation), and compares them to the characteristics of a random sample of male respondents from Islamabad/Rawalpindi and Lahore (*City sample*) obtained from a separate survey we conducted in 2010. On average, student age varies between 20 and 22. Since we find no significant differences among the Madrassas in terms of either their demographic characteristics or their experimental behavior, we combine the four Madrassas into one group to keep the tables and analysis simple (the disaggregated statistics are available from the authors upon request). However, because they differ in their students’ characteristics and tuition level (as we show below), we classify the two Liberal Universities (LU) into two separate groups: a Liberal Western-style university (LU-W) and a Liberal modern (LU-M) University. LU-W is more selective and liberal than the LU-M, and it caters to a higher socioeconomic segment of the society.

<sup>18</sup> Besides having ample experience in conducting surveys, another main reason for hiring the IU Survey Center for the data collection was that they were well-connected to both the secular and religious institutions in the two cities. We believe this helped us in obtaining consent from the different types of schools for the data collection.

<sup>19</sup> Female students from the Islamic and Liberal Universities also participated in the experiments. We restrict the analysis in this paper to male students who were matched with other male students in order to focus on group identity, defined by socioeconomic class and religiosity (proxied by institution). The full sample (before excluding female students from IU and LU, and male students from all institutions matched with female students) consists of 2836 students. The Madrassas we surveyed cater to male students only. Female Madrassas tend to be small. Since large sample sizes are needed for randomization in the experiment, we did not include them in our sample.

**Table 1**  
Summary characteristics.

	LU-W (1)	LU-M (2)	IU (3)	Madr (4)	City (5)	F-test (6)
Number of observations	168	287	270	796	394	
Age	20.37*** (2.66)	21.68** (2.25)	21.75** (2.36)	22.16 (3.04)	33.74*** (13.22)	0.000
Father's years of education	14*** (1.6)	11*** (6.1)	11*** (4.3)	7.1 (5)	7.7* (5.4)	0.000
Mother's years of education	13*** (2.8)	11*** (4.8)	7.1*** (5.1)	3.5 (4.3)	4* (4.9)	0.000
Parents' monthly income (in 1000s Rs)	192*** (235)	99*** (146)	42*** (53)	21 (70)	25 (24)	0.000
Number of siblings (including self)	2.7 (1.4)	3.9+++ (2.1)	4.7+++ (2.4)	n/a	5.1+++ (3)	0.000
% Father attended Madrassa <sup>a</sup>	4***	14**	13***	21	1***	0.000
% Mother attended Madrassa	5	13++	7	n/a	1+++	0.000
% Friend attended Madrassa	5	22+++	23+++	n/a	1+++	0.000
% Sibling attended Madrassa	7	23+++	26+++	n/a	2+++	0.000
% Parents own:						
Home	92***	86*	84	82	100***	0.000
Tv	91***	84***	77***	30	84***	0.000
Cellphone	90***	79***	80***	72	97***	0.000
Computer	83***	69***	60***	25	70***	0.000
Internet access	77***	50***	40***	8	45***	0.000
Motorbike	47***	65***	50***	32	61***	0.000
Car	84***	68***	43***	11	37***	0.000
Religiosity (0–10) <sup>b</sup>	5.3*** (1.7)	5.9*** (2)	6.3*** (1.6)	9.2 (1.6)	6.1*** (2.4)	0.000
Number of times pray each day	1.5*** (1.6)	2.2*** (1.6)	2.9*** (1.6)	4.9 (.41)	2.9*** (1.9)	0.000
% Fast during Ramadan	89*** (.24)	92*** (.2)	96*** (.14)	98 (.13)	89*** (.24)	0.000
Trust (0–10) <sup>c</sup>	4.3*** (2)	4.8 (2.6)	4.5** (2.8)	5.1 (3.4)	n/a	0.003
Risk general (0–10) <sup>d</sup>	6.7*** (2)	6.9*** (2.4)	6.5*** (2.4)	5.3 (4)	n/a	0.000
% Watch English-language news	86***	83***	82***	24	24	0.000
% Watch BBC or CNN	62***	60***	58***	23	12***	0.000
% Know victim of violent attack	14	16	34+++	n/a	14	0.000

LU-W is the most selective school, Liberal Western-style University; LU-M is the Liberal Modern University; IU is Islamic University; Madr is Madrassa; City refers to a random sample of the populations in the two cities.

This table shows pairwise *t*-tests for each institution group characteristics versus those of Madrassa. \* Significant at  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

For those characteristics not available for Madrassa students, pairwise *t*-tests are shown versus those of LU-W. Significant at \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

<sup>a</sup> Percent of respondents whose father attended a Madrassa or any religious institution for more than 2 years (either part time or full time).

<sup>b</sup> Self-reported religiosity on a scale of zero (not religious at all) to 10 (very religious).

<sup>c</sup> Response to question: "most people can be trusted?" on a scale of zero (all people cannot be trusted) to 10 (all people can be trusted).

<sup>d</sup> Self-reported risk preference on a scale of zero (totally unwilling to take risk) to 10 (fully prepared to take risks).

Table 1 shows observed differences among respondents from the four groups, ranked by most-to-least liberal institutional affiliation. Students at more liberal schools have parents with higher income, education, and asset ownership. For example, the average number of years of father's (mother's) schooling is 14 (13) for students from the Liberal Western-style University compared to 7.1 (3.5) years in the Madrassas. Similarly, the monthly parental income in the liberal Western-style University is nearly 10 times the income in the Madrassas. Moreover, the characteristics of students at LU-W and LU-M, the two Liberal Universities, are significantly different from each other in most cases. For example, average parental income for LU-W students is almost twice that of LU-M students.

Self-reported religiosity and the number of prayers per day also vary by group. Students were asked to rate how religious they considered themselves to be on a scale from 0 (not religious at all) to 10 (very religious). The average religiosity is 5.3 in the liberal Western-style University compared to 9.2 in the Madrassas. The former also pray much less frequently every day (1.5 as compared with 4.9 times per day). Students were also asked about their risk attitudes on a 0–10 scale (with zero being totally unwilling to take risk)<sup>20</sup>; the average Madrassa student is less willing to take risks (5.3) than Liberal University students.

Finally, students differ in their exposure to information and media, as well as in peer group characteristics. Just 23% of the Madrassa students report watching BBC and CNN, compared with 60% of the students of the other groups. In addition, while

<sup>20</sup> Dohmen et al. (2011) find that the risk tolerance self-reported on this qualitative scale is consistent with the risk preference elicited with a financially incentivized lottery-type experiment developed by Holt and Laury (2002). Other studies using this measure of risk attitude include Caliendo et al. (2010).

fathers of only 4% of students attending LU-W spent more than two years studying in a Madrassa either on a part-time or full-time basis, the corresponding proportion for Madrassa students is 21%. Similarly, about 6% of the LU-W students have at least a sibling or a friend who spent more than two years in a Madrassa either part- or full-time, compared with nearly a quarter of students at LU-M and IU.<sup>21</sup> This also suggests that the various groups in our setting do interact with and have exposure to each other at some level.

Institutional sorting based on socioeconomic and other characteristics is stark but unsurprising given Pakistan's divided history. As we move from left-most LU-W (column 1) toward Madrassas (column 4) in Table 1, the average socioeconomic characteristics deteriorate (for example, parental income and education decrease). At the same time, extent of religiosity increases. If we compare the students to the City sample (column 5), we see that Madrassa students seem to hail from humbler backgrounds than do those from the general population in the cities, and that all other institutions fare better in terms of most indicators of wealth. This is consistent with the hypothesis mentioned above that poverty may drive families to send their children to Madrassas.

The last row of the table also shows that a non-trivial proportion of respondents (14–34%) in each setting have an acquaintance who died or was injured as a result of the violence in Pakistan. This shows again, as pointed out in Section 2.1, that violence is widespread and has affected a large proportion of the general public.

### 3.2. Design of experimental games

We now present the details of the experimental games that we run to understand how the groups interact with each other.

*Procedure:* The experiments were conducted in sessions of 50–100 students in a classroom of the student's institution. The rooms were large enough to ensure respondent anonymity. The instructions were given to each participant, read out aloud by the experimenters and projected on a retro-projector.<sup>22</sup> Respondents played the games on a paper questionnaire and were matched with an actual partner ex-post, so they did not learn the actual identity or action of their partner while playing the game. The questionnaire was administered in Urdu at all places except the Western-style liberal University where it was conducted in English, since students there are more used to reading and writing in English.<sup>23</sup> Moreover, the questionnaires were identical across all the institutions up to the section leading into the experiments.

*Games:* Students were asked to play the following games:

- *Trust game:* Player A (the sender) is given a fixed amount of money (Rs. 300) and decides whether to keep it or give it to Player B (the receiver), i.e. to invest it. If given to Player B, the experimenter triples that amount and gives it to Player B who is asked to choose whether to transfer any money back to player A (which can be any amount between zero and Rs. 900). This is a binary version of the "trust game" introduced by Berg et al. (1995) – it is binary in the sense that player A can choose to send either nothing or the entire amount. The efficient outcome is for A to invest the money by transferring it to player B, while the subgame perfect equilibrium is to keep the money. Lack of trust toward the partner may lead to inefficiencies. In our setting, all respondents first played the role of Player A and then the role of a Player B, who received the money. When put in the role of Player B, we use the strategy method and ask the respondent to report the amount he would like to send back conditional on Player A deciding to invest.
- *Dictator game:* This is a one-stage game in which Player A (the sender) divides a fixed amount of money (Rs. 400) between himself and Player B (the receiver). Player B does not make any decision. Again, respondents play first in the role of Player A and then in the role of Player B (in which case there is no decision to make).
- *Expectations:* For both the trust and dictator games, respondents were asked to guess (i) the average amount that students from their own institution chose to give to their partners, and (ii) vice versa, the average amount that students from the partner's institution chose to give to their match in the respondent's institution.<sup>24</sup> Note that when students are asked to provide their expectations, they are asked about the average payoffs for an identical pair of partners (see the exact instructions in Appendix A2).

*Treatment:* The treatment in this experiment is the randomization of institution of the pair of players.<sup>25</sup> Each student was randomly matched with *only one* of the following partners: a male Madrassa student, a male student from a Liberal University, or a male student from an Islamic University. Students from the Liberal Modern (Western-style respectively)

<sup>21</sup> Because of sensitivity concerns, the set of background questions asked in Madrassas was a subset of that asked at other institutions. This information was collected after the experiments had been completed.

<sup>22</sup> Full instructions are presented in the online Appendix A2.

<sup>23</sup> The translation was supervised by Basit Zafar (co-author) who speaks both English and Urdu fluently, to ensure that nothing was lost in translation.

<sup>24</sup> While we want to measure the respondent's expectation of the amount his partner sends back, we ask the respondent to guess the average amount sent back by all students from the partner's institution (who are matched with students in the respondent's institution). This is because, asking the respondent for his expectation of the amount sent back by his partner, may prompt the respondent to report expectations that rationalize his own investment decision in the trust game. We believe our approach mitigates this concern of ex-post rationalization, and is hence superior.

<sup>25</sup> We also randomized the gender of the partner. We focus here on pairings of male subjects. We discuss results by gender in Delavande and Zafar (2014). However, each student is only paired with a partner of one gender.



**Table 2**  
Number of respondents by match.

Institution	Matched with:			Total
	LU <sup>a</sup>	IU	Madrassa	
LU-W	58	51	59	168
LU-M	95	90	102	287
IU	89	86	95	270
Madrassa	236	198	362	796
Total	478	425	618	1521

<sup>a</sup> LU-M were matched with LU-M. All other institutions were matched with LU-W.

university who were selected to be matched with a student from a Liberal University were informed that they were matched with a student from their own university. All other students who were selected to be matched with a student from a Liberal University were informed that they were matched with a student from the Liberal Western-style University. The description of the match (with the *exact name* of the match's educational institution) was already printed on the paper questionnaire received by each participant, so students were not aware that other participants in their session were possibly matched with partners of different educational institutions. Each student was informed that they would play all the games with the same partner. Students were given a short description of the institution they were matched with but since the selected institutions are among the most well-known institutions, most students would have some prior knowledge of them. In terms of implementation, the pairing was carried out with replacement (i.e., multiple students could have been matched with the same partner), and the match was one-way, i.e., the partner with whom the student was matched may or may not have been matched with the same student. Table 2 presents the sample sizes for each institution, and for the various matches.<sup>26</sup> Because we use a one-way match, the sum in a given row does not match the sum in the corresponding column; for example, while there are a total of 270 IU students in our sample, 425 students were matched with an IU student.

*Payoffs:* Respondents received financial compensation for their participation in the survey and the games. Each received a show-up fee of Rs. 200 given on the day of the session. Some tasks were then randomly chosen for determining the additional payoffs. One of the four roles (sender or receiver in the trust game, sender or receiver in the dictator game) was randomly selected for compensation, along with one of the four expectations questions (Rs. 50 if the respondent correctly identified the interval where the actual average lies). Before making their decisions, students were (repeatedly) informed that they would receive compensation for only *one* of the four roles, chosen at random.<sup>27</sup> This ensures that respondents treat each task independently, and do not hedge in their choices across tasks. Once the sessions were completed, we randomly matched students with a particular male partner from the institution indicated in their questionnaire and determined the payoffs. Starting about one week after the completion of the experiment, subjects could pick up their compensation in sealed envelopes. Respondents earned an average of Rs. 600 from the games. The overall average compensation of Rs. 800 corresponds to about USD 10. The 2009 per capita GNI at purchasing power parity in Pakistan was \$2710, compared to \$46,730 in the US. This means the average compensation of USD 10 corresponds to 0.4% of the GNI per capita. The US equivalent would be approximately USD 170. Therefore, the stakes involved in the experiments were substantial.

#### 4. Experimental results

We now discuss the results of our experiments. We postpone the discussion on the mechanisms behind the results to later sections. To better understand interactions between the different groups, we address five main questions.

*Question 1: Does investment behavior in the trust game vary by group (i.e., institution type)?*

We begin by investigating whether investment behavior varies systematically by group. The first column of Table 3 shows the overall proportion of senders who chose to send the Rs. 300 in the trust game. A few notable patterns stand out. First, respondents are quite trusting on average, with 74.6% of students sending the Rs. 300. This is in the higher range of what respondents have been found to send in the few studies that use a version of the binary trust game, where the investment rate varies from 32% (Bohnet and Huck, 2004) to 91% (Engle-Warnick and Slonim, 2004).<sup>28</sup> Second, there is heterogeneity of investment behavior by group, with Madrassa students being most likely to invest. For example, 80% of

<sup>26</sup> Students at Madrassas who were assigned a "Male Madrassa treatment" were matched either with a student at their own Madrassa, or a different Madrassa but one that belonged to the same school of thought, i.e., Barelvi (Deobandi) Madrassa students were only matched with students at another Barelvi (Deobandi) Madrassa. Because we do not find any systematic differences between the two in our analysis, the two groups are combined in the main tables (we discuss the differences between the two Madrassas in a later section). Since it combines two treatments, more Madrassa students are matched with Madrassa students than with LU and IU students in Table 2.

<sup>27</sup> Upon completion of the experiments and survey, a 4-sided dice was rolled for each student and they were informed about the task they would receive compensation for.

<sup>28</sup> One needs to be cautious in making any comparisons with the few studies that employ a binary trust game, since small modifications in the design (such as stake size, stake increase in the investment game – in our case three times, specifics of the match that the respondent is informed about, sample characteristics) can result in large differences. The continuous trust game has been employed by more studies. Players A (trustors) send about 50% of their endowment in such games in developed as well as developing countries (Camerer, 2003; Cardenas and Carpenter, 2008).

**Table 3**  
Proportion of respondents who send money in the Trust game.

Institution		Total (1)	Matched with			<i>p</i> -value for <sup>a</sup>	
			LU (2)	IU (3)	Madr (4)	<i>F</i> -test (5)	Kruskal–Wallis (6)
LU-W		0.631	0.552	0.686	0.661	0.296	0.294
LU-M	N	168	58	51 Median	59		
		0.781	0.737	0.844*+	0.765	0.189	0.188
IU	N	287	95	90	102		
		0.615	0.551	0.628	0.663	0.282	0.281
Madr	N	270	89	86	95		
		0.802	0.826	0.808	0.782	0.398	0.397
Total	N	796	236	198	362		
		0.746	0.724	0.765	0.749	0.359	0.359
	N	1521	478	425	618		
<i>p</i> -Value for <sup>b</sup>							
	<i>F</i> -test	0.000	0.000	0.001	0.039		
	Kruskal–Wallis	0.000	0.000	0.001	0.039		

In addition, the table also conducts two sets of pairwise hypothesis tests between having a match from own institution type versus another institution type. *p*-Values of these tests are not reported but their significance is denoted by plus (+) or asterisks (\*): (1) Wilcoxon rank-sum tests significant at \**p* < 0.10, \*\**p* < 0.05, \*\*\**p* < 0.01. (2) *T*-tests significant at \**p* < 0.10, \*\**p* < 0.05, \*\*\**p* < 0.01.

<sup>a</sup> *p*-Values of tests for equality of means/distributions across matches within a row institution.

<sup>b</sup> *p*-Values of tests for equality of means/distributions across institutions.

the Madrassa students chose to send the money compared to 61% of IU students. When comparing the four groups, we can reject equality of the means using an *F*-test, and the hypothesis that all samples are drawn from the same distribution using a Kruskal–Wallis test (tests presented in the last two rows of Table 3).<sup>29</sup> When conducting pairwise *t*-tests, we find that the mean investment rate of the Madrassa students is statistically significantly different from that of the other groups, except for LU-M.

It is also of interest to evaluate whether group membership solely leads to the distinctive behavior, or whether observable characteristics partly explain this difference. We investigate this in columns (1)–(3) of Appendix Table A2, which reports the marginal effects of a probit regression of the decision to send money in the trust game on observables as well as institution dummies. We also include a variable “relative earnings of matched partner”, which is the respondent’s perceived average earnings of a 30-year old graduate from the matched institution relative to the respondent’s average earnings of an average graduate from their own institution.<sup>30</sup> This variable is included to allow for the possibility that behavior in the games may be impacted by the perceived socioeconomic background of an average person in the matched institution (which may be a good proxy for the matched partner’s socioeconomic background). We find that observable characteristics, such as measures of socioeconomic background (parental wealth, parents’ income, parents’ education), age, risk preference and self-reported religiosity have little power in explaining the decision to invest in the trust game (column 1). Column 2 shows that attending a Madrassa and attending LU-M is associated with a higher probability of sending money in the trust game, compared to attending LU-W (both coefficients statistically significant at 1%, and not statistically different from each other). Moreover, the coefficient on the Madrassa and LU-M dummies stays statistically significant even after controlling for observables (column 3), suggesting that sorting on observables into these institutions cannot explain the differential behavior across groups.<sup>31</sup>

We summarize these results below:

**Result 1.** Investment behavior in the trust game varies by group, with Madrassa and LU-M students being more likely to invest. Differences in observable characteristics do not explain the differential behavior across groups.

*Question 2 Do students exhibit in-group bias and is there differential treatment (discrimination) in terms of investment against a particular group?*

As pointed out earlier, a large body of literature suggests that individuals tend to favor members of their own group, though other work finds that there is out-group favoritism from lower status groups when groups are unequal. We now investigate whether there is in-group or out-group bias, or systematic discrimination in favor of or against a particular group

<sup>29</sup> Note that this result is not driven by the larger sample size of pairs of Madrassa students matched with other Madrassa students as we obtain similar results if we look at the investment behavior for a given partner. For example, among subjects matched with students from the IU, we see that 63% (80%) of the IU (Madrassa) students decided to invest. We discuss these results below.

<sup>30</sup> Respondents were asked the following question: “Consider a typical male student who graduates from each of the institutions listed in column 1 below and who is working at age 30. Think about the kinds of jobs that will be available to him. How much do you think he could earn per MONTH on AVERAGE at the age of 30 at these jobs?”

<sup>31</sup> Columns (2)–(3) of Appendix Table A2 also include a Barelvi dummy (that equals 1 if the student is enrolled in a Barelvi Madrassa) interacted with a Madrassa dummy. Since the specification includes a Madrassa dummy, the coefficient on this interaction shows the average additive effect of being enrolled in a Barelvi Madrassa relative to a Deobandi Madrassa. We see that the estimate is statistically and economically not different from zero, indicating that Doebandi and Barelvi Madrassa students exhibit similar behavior in the trust game.

in our data. For each group, Columns (2)–(4) of Table 3 show the proportion of respondents who sent the Rs. 300 in the trust game conditional on the group they are matched with. Within each group (i.e., each row institution), we do not reject the hypothesis that the proportion of respondents who invest does not vary by the matched group (as indicated by the F-test for equality of proportions within group, and Kruskal–Wallis that tests whether the data come from the same distribution in columns 5 and 6, respectively). This suggests that there is no systematic discrimination against a particular group in any group's investment decision. In addition, we conduct two sets of pairwise hypothesis tests between having a match from one's own institution type versus another institution type (Wilcoxon rank-sum, and *t*-test). The table does not report the *p*-values for these tests, but simply denotes their significance either with an asterisk or a plus symbol. We see that none of the pairwise tests are statistically significant at levels of significance of 10% or lower (with the exception of the amount sent by LU-M students to IU students versus students at their own institution). This indicates that students do not invest more extensively when interacting with a partner from their own group.<sup>32</sup>

One potential issue in interpreting this null result is whether there is enough statistical power to find a statistically significant effect. This may be more of a concern for LU-W, LU-M and IU where the sample sizes are smaller than for the Madrassas. The relative magnitudes in Table 3, however, always show that students do not favor their own group: the proportion of students who send money in the trust game to members of their own group is never higher than that of students matched with other institutions. For example, while on average, 63% of the LU-W students invest in the trust game, only 55% of those matched with LU do so. Looking at the relative magnitude of the proportions, there is also no evidence that Madrassas students are treated differently than the other groups. As an additional check, we group LU-W, LU-M and IU and test the hypothesis that the proportion of students who invest in the trust game is the same depending on whether they were matched with a Madrassa student or a student from this new aggregated group. Using a *t*-test, we do not reject this hypothesis (*p*-value = 0.417).

We summarize this result below:

**Result 2.** There is no evidence of in-group bias or of differential treatment to any particular group in the trust game.

When playing the trust game, there are several dimensions of preferences and beliefs that may motivate a subject to “invest”, i.e., to send money to the matched partner:

- (i) unconditional other-regarding preferences such as altruism (Andreoni and Miller, 2002), warm glow (Andreoni, 1990), inequity-aversion (Fehr and Schmidt, 1999; Bolton and Ockenfels, 2000) or maximin preferences (Charness and Rabin, 2002),
- (ii) beliefs about trustworthiness of the partner (Dufwenberg and Gneezy, 2000; Cox, 2004; Ashraf et al., 2006), and
- (iii) risk preferences (Karlan, 2005; Schechter, 2007).

Results from the trust game do not allow identification of the relative roles of those dimensions (Cox, 2004). While Result 2 emphasizes a homogenous investment behavior toward the various groups, such a result could still be consistent with different levels of trust and of unconditional other-regarding behavior toward certain groups.<sup>33</sup> For example, Madrassa students may invest similarly in IU students and Liberal University students because they do not trust IU students but are altruistic toward them while they trust Liberal University students but do not exhibit altruism toward them.

Our multiple-game experimental design allows us to separately measure unconditional other-regarding behavior and expected trustworthiness. In the dictator game, the only motive for sending money to the partner is unconditional other-regarding behavior.<sup>34</sup> We can thus learn more about other-regarding behavior by analyzing how students played that game. In addition, the elicitation of expected average amount sent back by each group to students from their own institution gives us a measure of expected trustworthiness or stereotype toward each group. This is developed in the two following questions.

*Question 3: Is there taste-based discrimination against a group?*

Table 4 shows the average amount sent in the dictator game for all pairs of partners. As shown in the first column in the last panel, on average, students sent Rs. 171 (42.7% of the total amount) to their partner and only 6.7% did not send anything at all. This is a very high level of unconditional other-regarding behavior when compared to the standard of dictators typically sending between 20% and 30% of their endowment in both developed as well as developing countries (Camerer, 2003; Cardenas and Carpenter, 2008). There is however substantial heterogeneity in respondents' behavior, as indicated by a large standard deviation of Rs. 77.

<sup>32</sup> These results also hold if we control for respondents' observables in within-institution regressions with match dummies.

<sup>33</sup> Since students were randomly assigned a treatment (i.e., match type), differences in risk preferences cannot explain any of the results since there is no reason to believe that risk preferences would change by match type. Therefore, we do not focus on this explanation when decomposing behavior in the trust game. However, we do have qualitative measures of risk preferences from the respondents, and they in fact are similar within each treatment conditional on the student's institution.

<sup>34</sup> We follow the broad experimental literature in interpreting differences in dictator game behavior as a measure of taste-based discrimination (e.g., Fershtman and Gneezy, 2001; List, 2004) though we acknowledge that other motives are possible. Note also that the dictator game has been found to be sensitive to framing effect (e.g., Charness and Gneezy, 2008). While framing is likely to affect the level of behavior in these games, it is unlikely to affect between-subject differences.

**Table 4**  
Amount sent in the dictator game.

Institution	Matched with				P-value for		
	Total (1)	LU (2)	IU (3)	Madr (4)	F-test <sup>b</sup> (5)	Median test <sup>d</sup> (6)	Kruskal-Wallis <sup>f</sup> (7)
<i>LU-W</i>							
Mean	161	141	179**	166	0.044	0.153	0.108
Median	200	200	200**	200			
Std dev	83.4	82.4	88.2	76.8			
N	168	58	51	59			
% Who did not send	10.7	15.5	5.9	10.2	0.268	0.264	0.266
<i>LU-M</i>							
Mean	168	158	181**	167	0.125	0.148	0.368
Median	200	200	200	200			
Std dev	78.6	73.1	72.8	87.0*			
N	287	95	90	102			
% Who did not send	7.3	8.4	4.4	8.8	0.450	0.448	0.449
<i>IU</i>							
Mean	144	142	135	155	0.280	0.351	0.446
Median	200	200	185	200			
Std dev	82.2	86.7	82.1	77.5			
N	269	88	86	95			
% Who did not send	13.8	15.9	16.3	9.5	0.323	0.321	0.322
<i>Madrassa</i>							
Mean	183	187*	189**	177	0.074	0.075	0.040
Median	200	200**	200**	200			
Std dev	70.6	69.1	74.7	69.0			
N	790	233	198	359			
% Who did not send	3.2	3.8	3.0	2.8	0.760	0.759	0.759
<i>Total</i>							
Mean	171	167	176	171			
Median	200	200	200	200			
Std dev	77.1	77.7	80.0	74.6			
N	1514	474	425	615			
% Who did not send	6.7	8.4	6.4	5.5			
<i>P-value for</i>							
F-test <sup>a</sup>	0.000	0.000	0.000	0.059			
Median test <sup>c</sup>	0.023	0.014	0.015	0.850			
Kruskal-Wallis test <sup>e</sup>	0.000	0.000	0.000	0.022			

In addition, this table also conducts four sets of pairwise hypothesis tests between having a match from own institution type versus another institution type for amount sent. *P*-values of these tests are NOT reported but their significance is denoted by stars (\*). Significance of (1) *t*-test is reported on the means, (2) Wilcoxon rank-sum test is reported on the medians, (3) Kolmogorov–Smirnov test is reported on the sample sizes, and (4) *F*-test for equality of standard deviations, reported on the std dev. For all four, \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

<sup>a</sup> *F*-test for the equality of means for a given match across institutions (column).

<sup>b</sup> *F*-test for the equality of means across matches within an institution group (row).

<sup>c</sup> Nonparametric median test for the equality of medians across institutions for a given match.

<sup>d</sup> Nonparametric median test for the equality of medians across matches within an institution.

<sup>e</sup> Kruskal–Wallis test for the equality of distributions across institutions for a given match.

<sup>f</sup> Kruskal–Wallis test for the equality of distributions within an institution by match.

Looking at the other panels of the table, what stands out is that the average amount sent in the dictator game to students in one's own school is always lower than that sent to students in any of the out-groups, though the differences are not statistically significant in most cases (as indicated by the *p*-values reported in the last three columns of the table). We see that within Liberal Universities and Madrassas, there is some evidence that students tend actually to give less to their own group compared to IU students (as indicated by the pairwise *t*-test and the Wilcoxon rank-sum test, denoted by stars on the mean and median, respectively; the table does not report those *p*-values).<sup>35</sup> Another difference in behavior is noticeable: Madrassa students give on average more than any other group and are less likely to give nothing. We also investigate the predictive power of observable characteristics at explaining the amount sent in the dictator game in columns (4)–(6) of Appendix Table A2. Again, we find that the higher unconditional other-regarding behavior of Madrassa students (and lower

<sup>35</sup> However, for all groups, we do not reject equality of distribution based on the pairwise Kolmogorov–Smirnov test when comparing own group versus other groups (as indicated by the absence of any stars that denote significance on the sample sizes).

**Table 5**  
Amount expected back from match out of Rs. 900.

Institution	Total (1)	Matched with:			P-value for:		
		LU (2)	IU (3)	Madr (4)	F-test (5)	Median test (6)	Kruskal–Wallis (7)
<i>LU-W</i>							
Mean	350.6	336.2	406.9**	316.1	0.011	0.003	0.012
Median	350.0	350.0	450.0**	350.0			
Std dev	165.1	156.1	185.8	143.4			
Prop. expect >200	0.845	0.828	0.902	0.814	0.402		0.400
Prop. expect >300	0.607	0.586	0.725	0.525	0.094		0.094
Prop. expect >400	0.375	0.362	0.549	0.237	0.003		0.003
N	168	58	51	59			
<i>LU-M</i>							
Mean	370.91	379.5	376.7	357.8	0.455	0.884	0.556
Median	350.00	350.0	350.0	350.0			
Std dev	131.62	132.0	131.4	131.8			
Prop. expect >200	0.913	0.937	0.900	0.902	0.601		0.600
Prop. expect >300	0.746	0.789	0.756	0.696	0.314		0.313
Prop. expect >400	0.470	0.484	0.478	0.451	0.885		0.884
N	287	95	90	102			
<i>IU</i>							
Mean	357.78	333.2**	379.1	361.6	0.095	0.099	0.082
Median	350.00	350.0**	350.0	450.0			
Std dev	141.60	158.3	138.8	124.5			
Prop. expect >200	0.878	0.787	0.930	0.916	0.005		0.006
Prop. expect >300	0.700	0.640	0.756	0.705	0.250		0.249
Prop. expect >400	0.452	0.360	0.488	0.505	0.100		0.100
N	270	89	86	95			
<i>Madrassa</i>							
Mean	405.8	404.1	405.9	406.8	0.975	0.566	0.875
Median	450.0	450.0	450.0	450.0			
Std dev	145.9	153.1	145.4	141.8			
Prop. expect >200	0.918	0.919	0.919	0.917	0.993		0.994
Prop. expect >300	0.779	0.750	0.783	0.796	0.418		0.418
Prop. expect >400	0.612	0.623	0.591	0.616	0.774		0.774
N	787	233	195	359			
<i>P-value for:</i>							
F-test	0.000	0.000	0.283	0.000			
Median test	0.000	0.007	0.070	0.002			
Kruskal–Wallis test	0.000	0.000	0.161	0.000			

This table conducts three sets of pairwise hypothesis tests of equality of amount expected from a match from own institution type versus match from another institution type. *P*-values of these tests are NOT reported but their significance is denoted by stars (\*). Significance of (1) *t*-test is reported on the means, (2) Wilcoxon rank-sum test is reported on the medians, (3) Kolmogorov–Smirnov test is reported on the sample sizes, and (4) *F*-test for equality of standard deviations, reported on the std dev. For all four, \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

other-regarding behavior of IU students) is not entirely explained by differences in observable characteristics.<sup>36</sup> We do, however, find evidence of Barelvi Madrassa students being more altruistic than Deobandi Madrassa students.<sup>37</sup>

We summarize this in the following result:

**Result 3.** Within each group (institution type), there is no negative taste-based discrimination against any out-group. On the contrary, LU and Madrassa students tend to give more to the out-group than to their own group. Madrassa students also exhibit stronger unconditional other-regarding behavior than any other group.

*Question 4: Is there systematic difference in expected trustworthiness (stereotype) for a particular group?*

Table 5 shows the expectations reported by individuals regarding the average amount expected back from the matched group, i.e., it reveals expected trustworthiness (or stereotype). Note that respondents choose an interval for the average and

<sup>36</sup> Note that we cannot disentangle the exact mechanisms leading to each group's unconditional other-regarding behavior. As mentioned above, unconditional other-regarding behavior may be prompted by altruism, warm glow, inequity-aversion, or maximin preferences. For example, it could be that an average LU student has distaste (low altruism) toward Madrassa students (relative to tastes toward students at other institutions), but is very averse to income inequality. This could lead to similar average behavior in the dictator game toward different groups since Madrassa students tend to be from less affluent backgrounds; our "relative earnings of matched partner" variable should partly control for this, though.

<sup>37</sup> The Madrassa dummy estimate is statistically different from the estimate on all other schools in column (5) based on *F*-tests. Upon inclusion of observables in column (6), we cannot reject that the Madrassa dummy is statistically different from the LU-M dummy estimate. It, however, continues to be the case that Barelvi Madrassa students' average behavior (the sum of the coefficients on the Madrassa dummy and the Barelvi interaction term) is different from that of all other non-Madrassa students.

do not report a point estimate for the exact average. The mean, median and standard deviation amounts presented in Table 5 are those obtained by allocating the middle of the chosen interval as expected average. To conduct hypothesis testing on various quantiles of the distribution of expectations, we also present in Table 5 the proportion of respondents who expect to receive more than Rs. 200, more than Rs. 300, and more than Rs. 400 from the match.

Three points from this table are of note. First, Madrassa students most expect other groups to be trustworthy. Column (1) of Table 5 shows that Madrassa students expect back Rs. 406 on average while all other institutions expect less than Rs. 370, with the differences being statistically significant (see test for equality of means, medians, and distributions of the four groups presented at the bottom of Table 5).<sup>38</sup> LU-M students' average is the second highest across all the institutions. In Table 4, we saw that the same two groups – Madrassa and LU-M students – also exhibit the strongest other-regarding behavior. This may imply that trusting behavior is related to *both* unconditional other-regarding behavior as well as expectations of return. We return to this point in Section 6.

Second, students from LU-M and Madrassas expect all groups to be equally trustworthy (none of the  $p$ -values of the tests for equality of means, medians and distributions of the three matches presented in the last three columns of Table 5 are less than 5%). Finally, students from LU-W and IU expect different levels of trustworthiness across the various groups. LU-W students believe IU students to be the most trustworthy and Madrassa students to be the least trustworthy. For example, more than half of the LU-W students expect IU students to send back more than Rs. 400 compared to less than a quarter who expect Madrassa students to send more than Rs. 400. This difference is statistically significant as shown on the test based on the imputed expectations and on the proportion of respondents who expect to receive more than Rs. 400 ( $p$ -value less than 10% in the last three columns of Table 5).<sup>39</sup> In contrast, IU students expect Liberal University students to be the least trustworthy.

Columns (7)–(9) of Appendix Table A2 show that differences in observable characteristics cannot explain the high trustworthiness of Madrassa students, particularly Deobandi Madrassa students.<sup>40</sup> We summarize the results from Table 5 as follows:

**Result 4.** There is no systematic difference about perceived trustworthiness of other groups for LU-M and Madrassa students. Compared to other groups, Madrassa students most expect others to be trustworthy. LU-W students expect Madrassa students to be the least trustworthy.

#### Question 5: Are the stereotypes correct?

We now compare the expected amount sent to the actual amount sent in Table 6. We show the proportion of students who expected more than Rs. 300 from a given group and the proportion of students from that group who actually sent more than Rs. 300. In addition, we also show the proportion of students who had “accurate” expectations (i.e., chose the interval that contained the actual average), and the proportion of students who under-estimated the amount sent (i.e., chose an interval whose upper-bound was below the actual average).

Several interesting findings stand out. First, Liberal University (LU-W and LU-M) students have inaccurate expectations about Madrassa students. While 81% of the Madrassa students sent more than Rs. 300 to Liberal University students, only 52% of LU-W and 69% of LU-M students expected to receive more than this amount of money. The differences between actual proportions that sent and expected proportions are statistically significant at 5% (as indicated by the  $p$ -value in the third row of each panel in Table 6). Moreover, a large proportion of respondents from Liberal Universities under-estimated what Madrassa students would send back (76% of the LU-W and 54% of the LU-M students). Note that this result is not driven solely by the fact that Madrassa students actually send back the most amount relative to other groups (last row in each panel in Table 6), but also by the fact that Liberal Universities' students expect Madrassa students to be the least trustworthy (Table 5). Second, Madrassa students expected more from Liberal University students than what they actually received from them: only 13% of the Madrassa students had accurate expectations while 64% over-estimated the amount they would receive. On the contrary, IU students tended to expect less from Liberal University students than what they actually sent (the  $t$ -test for equality of proportion of students who expect more than Rs. 300 and the proportion who actually sent more than Rs. 300 is statistically significant at 10%). These differences, however, do not seem to be large enough to generate differences in investment behavior in the trust game (see Result 2), possibly because of the binary nature of the decision.

An interesting question is whether the error in perceived trustworthiness is correlated with individuals' characteristics. We investigate this in Table 7, where the dependent variable is the gap in perceived trustworthiness (that is, perceived

<sup>38</sup> The median test is a non-parametric test testing the null hypothesis that all the samples are drawn from populations with the same median. The data in each sample are assigned to two groups, one consisting of data whose values are higher than the median value in the two groups combined, and the other consisting of data whose values are at the median or below. A Pearson's chi-square test is then used to determine whether the observed frequencies in each group differ from expected frequencies derived from a distribution combining the two groups. Because of this, there are instances in Table 6 where we reject the null hypothesis under the median test, even when the medians are identical.

<sup>39</sup> The last three columns of Appendix Table A2 investigate the predictive power of observable characteristics at explaining the amount expected back in the trust game. Again, we find that the higher expectation of Madrassa students is not entirely explained by differences in observable characteristics. There is also some evidence that, relative to Deobandi Madrassa students, Bareilvi Madrassa students have lower expectations of the return.

<sup>40</sup> In column (8), the Madrassa dummy (as well as the sum of the Madrassa dummy and Bareilvi interaction term) is statistically different from the estimates on all non-Madrassa institutions. In column (9), the Madrassa dummy is statistically different from the estimates on the non-Madrassa institutions (but the Madrassa + Bareilvi  $\times$  Madrassa term is no longer statistically different from the LU-M dummy estimate).

**Table 6**  
How do expectations compare with actual choices of trustees?

Institution	Total	Matched with			P-value for:	
		LU	IU	Madr	F-test	Kruskal–Wallis
<i>LU-W</i>						
Prop. expect >300	0.607	0.586	0.725	0.525	0.094	0.094
Prop. match sent >300	0.709	0.621	0.584	0.814 <sup>***,+++</sup>	0.000	0.000
P-value actual v. expected <sup>a</sup>	0.015	0.646	0.096	0.000		
Prop. accurate expectation	0.185	0.224	0.176	0.153	0.603	0.600
Prop. under-estimated	0.494	0.414	0.275	0.763 <sup>***</sup>	0.000	0.000
N	168	58	51	59		
Actual sent by match	411.19	365.44	347.30	465.08	0.000	0.109
<i>LU-M</i>						
Prop. expect >300	0.746	0.789	0.756	0.696	0.314	0.313
Prop. match sent >300	0.709	0.621	0.584	0.814 <sup>***,+++</sup>	0.000	0.000
p-value actual v. expected <sup>a</sup>	0.276	0.0053	0.015	0.017		
Prop. accurate expectation	0.328	0.305	0.278	0.392	0.208	0.207
Prop. under-estimated	0.341	0.211	0.244	0.549 <sup>***</sup>	0.000	0.000
N	287	95	90	102		
Actual sent by match	411.186	365.44	347.299	465.08	0.000	0.101
<i>IU</i>						
Prop. expect >300	0.700	0.640 <sup>*+</sup>	0.756	0.705	0.250	0.249
Prop. match sent >300	0.753	0.745 <sup>***,++</sup>	0.756	0.758	0.962	0.962
P-value actual v. expected <sup>a</sup>	0.124	0.092	1.000	0.341		
Prop. accurate expectation	0.404	0.303 <sup>++</sup>	0.442	0.463	0.060	0.060
Prop. under-estimated	0.548	0.640 <sup>*+</sup>	0.512	0.495	0.100	0.100
N	270	89	86	95		
Actual sent by match	428.43	409.08	410.58	449.98	0.026	0.010
<i>Madr</i>						
Prop. expect >300	0.779	0.750	0.783	0.796	0.418	0.418
Prop. match sent >300	0.748	0.708	0.779	0.757	0.370	0.370
P-value actual v. expected <sup>a</sup>	0.168	0.3551	0.9403	0.2124		
Prop. accurate expectation	0.361	0.1274 <sup>***,+++</sup>	0.455	0.461	0.000	0.000
Prop. under-estimated	0.339	0.237 <sup>***,+++</sup>	0.394	0.376	0.000	0.000
N	796	236	198	362		
Actual sent by match	413.69	397.39	415.79	420.47	0.240	0.001

In addition, this table conducts two pairwise hypothesis tests on the proportions between having a match from own institution type versus another institution type. P-values not reported but significance of the tests is denoted:

(1) Wilcoxon rank-sum tests significant at \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

(2) t-Tests significant at + $p < 0.10$ , ++ $p < 0.05$ , +++ $p < 0.01$ .

<sup>a</sup> t-Test for the equality of proportion that expect more than 300 and the proportion of match group that actually sent back more than 300.

average amount sent back by matched institution's students *minus* actual average amount sent back). The first (third) column regress the gap (absolute gap) on interactions for each of the possible pairs (the excluded pair is LU-W student matched with a LU student). The constant term, which shows the average gap for LU-W–LU pairs, shows an average over-estimation of Rs. 169, and an average over-estimation of the absolute gap by Rs. 192. Notably, Madrassa students tend to over-estimate more than their counterparts. Columns (2) and (4) show that inclusion of a large set of individual characteristics has little impact on the estimates of these interaction terms. Furthermore, most of the observables, including media consumption or whether a student ever attended a Madrassa, lack statistical significance. We obtain similar results when we restrict to sub-samples (e.g., Madrassa students or students matched with Madrassa students) and particular matched pairs, or when we cut the sample by exposure to media. This suggests that the mismatch in expectations cannot be explained by such observables.

**Result 5.** There is incorrect stereotyping. Liberal University students systematically under-estimate the trustworthiness of Madrassa students, while Madrassa students systematically over-estimate the trustworthiness of Liberal University students. Stereotyping is not correlated with a large set of observable characteristics.

Finally, in Appendix A3, we discuss a list of factors that could possibly influence our findings (such as whether students misunderstood the games, and potential bias due to Hawthorne effect), and present strong pieces of evidence that suggest that these possible explanations are unlikely to be driving our results.

## 5. Why do Madrassa students behave differently?

We find that Madrassa students behave systematically differently from other groups: they exhibit a high level of trust, show the strongest other-regarding behavior, and have highest expectations of others' trustworthiness. Unless there is positive selection into Madrassa – i.e., students enrolling in Madrassas are more trusting and pro-social to start out with than the levels that we observe (something that is unlikely given the high levels of trust and other-regarding behavior we

**Table 7**  
Accuracy of expected amount sent back by trustees.

	Gap <sup>a</sup>		Absolute gap	
	(1)	(2)	(3)	(4)
LU-W matched with IU	62.29** (27.72)	60.92** (27.78)	55.89** (23.37)	54.54** (23.43)
LU-W matched with Madrassa	-23.65 (26.70)	-25.50 (26.71)	-28.91 (22.51)	-29.76 (22.53)
LU-M matched with IU	32.10 (24.31)	30.57 (24.74)	18.48 (20.50)	18.06 (20.87)
LU-M matched with LU	43.27* (24.06)	40.60+ (24.68)	32.78+ (20.29)	30.81+ (20.82)
LU-M matched with Madrassa	18.09 (23.75)	17.70 (24.31)	10.75 (20.02)	10.74 (20.50)
IU matched with IU	34.50 (24.53)	29.39 (25.65)	21.86 (20.69)	16.16 (21.63)
IU matched with IU	-3.06 (24.37)	-10.30 (25.55)	-0.91 (20.55)	-8.49 (21.55)
IU matched with Madrassa	21.83 (24.06)	16.55 (25.19)	14.77 (20.29)	9.45 (21.24)
Madrassa matched with IU	61.33*** (21.60)	43.08+ (26.27)	48.73*** (18.21)	35.27+ (22.15)
Madrassa matched with LU	67.87*** (21.19)	50.13* (26.03)	59.93*** (17.87)	46.92** (21.96)
Madrassa matched with Madrassa	67.08*** (20.43)	47.77* (25.54)	54.26*** (17.23)	39.82* (21.54)
Age	-	-0.23 (0.95)	-	-0.07 (0.80)
Father's years of schooling	-	-0.31 (0.79)	-	-0.03 (0.67)
Mother's years of Schooling	-	-2.25** (0.91)	-	-2.27*** (0.77)
Parents'Income (in Rs. 100,000)	-	0.04 (0.03)	-	0.03 (0.03)
Father attended Madrassa	-	13.95 (10.41)	-	10.24 (8.78)
Ever attended Madrassa	-	-3.88 (11.56)	-	-3.29 (9.75)
Parents'Ownership index (0–8)	-	2.80 (2.26)	-	2.25 (1.90)
Watch English-language news	-	-13.40 (9.36)	-	-6.02 (7.90)
Religiosity	-	1.01 (1.18)	-	0.61 (1.00)
Constant	168.96*** (18.96)	190.62*** (33.31)	192.15*** (15.99)	206.71*** (28.09)
Mean of Dep Var	213.44	213.44	227.31	227.31
Number of observations	1512	1512	1512	1512

Table reports OLS regressions of the dependent variable. Standard errors in parentheses.

Significant at \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

See Table 1 for description of all control variables.

<sup>a</sup> Gap = Average amount expected to be sent by trustees – actual average sent back.

find) – this would suggest that Madrassas are not teaching distrust, but are on the contrary promoting trust and pro-social behavior toward other members of the Pakistani society. Another possibility could be that the non-Madrassa institutions promote distrust and less pro-social behavior or that there is negative selection into non-Madrassa institutions, in a way similar to existing findings that economics students behave less cooperatively in experimental games (e.g., Carter and Irons, 1991; Frank et al., 1993). Again, given the high levels of trust and other-regarding behavior that we find, this does not seem to be likely. However, we cannot rule it out. If this is the case, our findings would be consistent with Madrassas teaching less distrust/anti-social behavior relative to other higher education institutions.

We seek to investigate this in more detail in this section. In particular, we investigate whether the difference in behavior of the Madrassa students is due to observable characteristics that lead students to attend Madrassas (selection). One potential explanation for the difference in behavior across groups could be systematic difference in preferences. In particular, lower risk-aversion could explain why Madrassa students are more likely to invest in the trust game. This lower risk aversion could be due to either selection or Madrassa attendance. However, Table 1 reveals that Madrassa students are on the contrary more risk-averse on average than any of the other groups.



We next investigate the role of socioeconomic status. We have seen that Madrassa students hail from humbler backgrounds (Table 1), so their different social origin could possibly explain their trusting behavior. However, in the U.S context, Alesina and La Ferrara (2002) find on the contrary that high-income groups tend to trust more. Using data from the 2000 World Value Survey, we also find that in Pakistan, higher income groups exhibit higher levels of trust, as measured by the proportion of people who state that “most people can be trusted these days” when asked “Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?” (Panel A in Appendix Table A3). Among the educated groups we consider, socioeconomic status does not have much predictive power in the decision to invest in the trust game (see Appendix Table A2). So the difference in socioeconomic status is unlikely to be the main driver of differences in behavior.

Another possibility is differences in levels of religiosity. This would be an issue in the interpretation of our results if Madrassa students had higher pre-existing levels of religiosity before enrolling into a Madrassa. Existing evidence suggests that religious rituals promote pro-social behavior (Iannacone, 1998; Ruffle and Sosis, 2007; Clingingsmith et al., 2009), though the evidence on the relationship between religiosity and trust and trustworthiness is mixed (Welch et al., 2004; Tan and Vogel, 2008; Daniels and von der Ruhr, 2010; Putnam and Campbell, 2010).<sup>41</sup> Religiosity alone, however, cannot explain the patterns that we observe across the institutions. Note that IU students rank second in terms of their average religiosity and adherence to religious practices, but are less likely to trust (Table 3) and to exhibit other-regarding behavior (Table 4) than Liberal University students. Moreover, when we exclude the Madrassa students, we do not find any statistically significant relationship between religiosity and behavior in the games (table not shown). Finally, using data from Pakistan from the 2000 World Values Survey, we find a non-monotonic relationship between religious attendances and trust (see Panel B in Appendix Table A3). So religiosity is also unlikely to be the main driver of differences in behavior.

Overall, it seems unlikely that selection into Madrassas by observable characteristics explains the trusting behavior of the Madrassa students. We are unable to directly investigate the extent to which selection into Madrassas by *unobservable* characteristics may impact our results, since we lack exogenous variation in the likelihood of individuals attending a Madrassa. However, given that controlling for observable characteristics has little impact on our results, we believe this is quite unlikely. Overall, our results suggest that there is little evidence of Madrassas playing a negative role by promoting distrust and anti-social preferences.

So what exactly is it about attending Madrassas that may lead their students to be more trusting and selfless? Given that Madrassas are closed institutions, one may argue that because their students have limited interactions with other society members, different aspects of their behavior are not fully formed yet and that, in that regard, their behaviors may be similar to those of children and teenagers. Existing research on behavior of children in experiments similar to ours shows that they are less trusting than adults and that younger children are not more trusting than older ones (Harbaugh et al., 2003), and that altruistic behavior in the dictator game is weakly increasing with age (Benenson et al., 2007). Moreover, we have additional evidence that Madrassa students have knowledge of, and are exposed to, the “outside” world. For example they are aware that earnings after graduating from a Madrassa are substantially lower than the earnings conditional on graduating from a Liberal University.<sup>42</sup> Additionally, their family members have been exposed to secular education. For example, the median number of years spent studying in secular institutions for Madrassa students’ fathers is 4 years (compared to 11 years for non-Madrassa students’ fathers). It is therefore unlikely that something about the Madrassa isolation and lifestyle are the main driver of our results.

Related to this, some of the patterns that we uncover may come from variation (across students in different school types) in interaction with individuals belonging to out-group versus in-group.<sup>43</sup> Rao (2014), for example, finds that exogenous variation in the number of poor students in Indian schools leads to an impact on the pro-social behavior of wealthy students, and that this is largely driven by interaction between the groups and not, say, changes in teaching practices. In our context, students in Liberal Universities may have limited interaction with Madrassa students, which may then lead them to have less accurate perceptions regarding the trustworthiness of Madrassa students. One way to test whether differential familiarity with in-group versus out-group can partly explain our results is to compare in-group match and out-group match response variances. Tables 4 and 5 also report the standard deviation for each match. With the exception of the standard deviation for the LU-M–Madrassa pairs (versus the LU-M–LU-M pairs in Table 4), none of the other 15 F-tests of equality of variances are rejected.

Relatedly, Table 1 shows that at all non-Madrassa institutions, a non-negligible proportion of students’ parents or siblings attended a Madrassa. These students may have a systematically different perception of Madrassa students. To investigate this, we analyze the behavior for the two sets of students – those who have exposure to Madrassas (defined as having a father, mother, friend, or sibling who ever attended a Madrassa) and those who have none – when matched with Madrassa students. We find similar patterns for the two groups, and cannot reject the equality of behavior (proportion that sends

<sup>41</sup> Very related to our context, Fair et al. (2012) examine the links between multiple elements of religiosity and support for militant actions in Pakistan. They find that neither religious practice nor support for political Islam is related to support for militant groups, while views of the definition of jihad is.

<sup>42</sup> Madrassa students correctly believe that, on average, students earn more than double if they graduate from LU-W compared to a Madrassa (detailed results available from the authors upon request).

<sup>43</sup> We thank a referee for pointing this out.

money in the trust game; average dictator game behavior; expected trustworthiness) in any of the cases.<sup>44</sup> Overall, this suggests that differential familiarity with the various groups does not explain our results.

One possible channel that may lead to our results is the nature of teachings at Madrassas and at the secular schools. Since religious teachings in general promote selflessness, and studying certain secular subjects is associated with different behavior with regards to cooperation and generosity (Carter and Irons, 1991; Frank et al., 1993),<sup>45</sup> the emphasis of Madrassas on religious teachings and their neglect of secular subjects (relative to the secular universities) may be one reason for our findings of high trust and high levels of pro-social behavior of Madrassa students. Similarly, while the Madrassas may not be able to really make their students become genuinely more pro-social, they may inculcate the idea that deviating from pro-social norms is socially very costly for them.

## 6. Discussion

Using experiments of economic decision-making (that measure trust and unconditional other-regarding behavior), we investigated how Madrassa students in Pakistan interact with other groups of Muslim male youth of very different religiosity, socioeconomic background and exposure to Western ideas. Our first finding is that, in this context, Madrassa students are amongst the most trusting, exhibit the highest other-regarding behavior, and expect others to be the most trustworthy. We provide evidence that this distinct behavior is not driven entirely by selection on observables, suggesting that it is unlikely that Madrassas inhibit inter-group trust among their students, at least toward other segments of the Pakistani society. Furthermore, we find no significant differences in the behavior of students in Madrassas belonging to the two interpretive traditions of Sunni Islam.

It is important to note that the four Madrassas we surveyed were not randomly selected, are mainstream, and located in urban centers. Since most Madrassas are similar to the ones that participated in the study and most prominent Madrassas are located in urban centers (and Madrassas across the country – including rural areas – tend to be affiliated with such Madrassas), our findings would extend to the vast majority of those institutions in Pakistan. However, one should keep in mind that Madrassas are heterogeneous and that our results pertain to mainstream Madrassas.

Though we cannot directly extend our conclusions to the role of Madrassas at grade-school or high-school levels, our findings from this group of college-level students – most of whom have spent earlier years in Madrassas too, and in most instances in the same Madrassa where they are pursuing college-level studies – are informative about the general role of Madrassas as an institution. Given that trust and other-regarding behavior are negatively correlated with violence and extremism (Sternberg, 2003; Lichbach, 2005; Nadler and Liviatan, 2006), our results would indicate that Madrassa reforms, which are encouraged by the US government and favored by the Pakistani public, may have only a limited impact on violence in Pakistan. They also suggest that the negative stereotype of Madrassas is unwarranted. Our findings would be hard to reconcile with the claim that Madrassas are the main perpetrators of domestic violence and hatred. However, more research is needed to establish the causal role of Madrassas, particularly in fermenting international terrorism. For this purpose, a natural extension to the setup in this paper would be to match students with groups of foreign individuals. One may be able to deal with the issue of selection by exogenously varying the salience of one's identity (for example, as in Benjamin et al., 2010b). While theoretically possible, the implementation of such a design may be quite challenging but an important avenue for future research.<sup>46</sup>

Another important finding from the experiment is the high levels of trust, trustworthiness and other-regarding behavior in our data when compared to existing studies in the literature. It has been argued that hierarchical religions, such as Catholicism and Islam, weaken trust (Putnam, 1993; La Porta et al., 1997).<sup>47</sup> Since our sample consists of Muslims entirely, the high level of trust found in this study is not consistent with this hypothesis. One possibility could be that Pakistan stands out in terms of trust when compared to other countries, but evidence from other surveys suggests that this is not the case. The World Value Surveys of 2000/2001 ask respondents from 70 countries whether “most people can be trusted” or one “needs to be very careful in dealing with people.” In Pakistan, 31% of the people surveyed agreed with the statement that most people can be trusted, which is very similar to the UK (30%) and the US (36%), and well below countries that are highly ranked in terms of trust such as Iran (65%) or Denmark (66%).

A third important finding is that there is no evidence of systematic in-group or out-group bias for any of the groups we consider in the investment decision in the trust game and no systematic discrimination in the dictator game. We do not

<sup>44</sup> In other analysis (available from the authors upon request), we compare the behavior of Madrassa students matched with their own Madrassa versus those matched with a different Madrassa. We, again, find no statistical difference in behavior. One exception is that the variance in expected trustworthiness of those matched with other Madrassas is statistically different (and larger) than those matched with own Madrassa.

<sup>45</sup> These papers find that students in fields such as Economics are less trusting, less cooperative, and more selfish. However, it seems that this relationship is driven primarily by selection into fields (Frey and Meier, 2005).

<sup>46</sup> Our experimental setup focuses on games of trust and other-regarding behavior, and so we are unable to say how these students would play in games of cooperation (such as public-good provision) and norm enforcement, in both the absence and presence of punishment. These alternative games may shed light on other important aspects of social and economic life. However, implementing them generally requires feedback in real time, which is usually not possible with paper-based experiments. Given the low computer literacy of certain subgroups of our sample, we chose not to include these other games.

<sup>47</sup> There is an extensive body of work investigating the relationship between religion and trust or behavior in games arguing, for example, that Catholicism inhibits trust while Protestantism promotes it (Putnam et al., 1993; Benjamin et al., 2010a).

find that Madrassa students behave differently when matched with students attending Universities with strong Western influence. Moreover, despite the fact that opinions collected from a subset of our respondents reveal that Madrassas are not viewed positively and are perceived to play some role in fostering extremism and violence, and a large proportion of the students have an acquaintance who died or was injured as a result of the violence in the country (Tables 1 and 2), we do not find that any of the other groups behave differently when matched with Madrassa students.

A possible explanation for the lack of group membership bias could be the fact that our groups are unequal in terms of two important social attributes: religiosity and socioeconomic background. Moreover, those attributes are negatively correlated across the groups. When groups are unequal, the lower status group tends to favor the higher status group (e.g., Jost et al., 2004). In our context, each student may feel they are of higher status in one of the dimensions when matched with another student. For example, Liberal University students may feel that they have the highest socioeconomic status, while Madrassa students may feel that they have the highest status when evaluated on the basis of religiosity. Islamic University students, who fare in the middle on both dimensions, may still feel that they have a higher status in terms of religiosity when matched with Liberal University students, and a higher status in terms of socioeconomic characteristics when matched with Madrassa students. The interplay of this two-dimensional status may thus weaken any group membership effect.

Another complementary possible explanation for the equal treatment, and also for the high level of trust and other-regarding behavior we observe, may be that violence within the society unifies people and that other students do not see the average Madrassa student as being responsible for it (despite not having positive perceptions of Madrassas themselves). Recent evidence suggests that community exposure to violent conflict increases the willingness to invest in trust-based transactions and to contribute to a collective good within the community (Gilligan et al., 2010), enhances altruistic behavior toward neighbors (Voors et al., 2010), and promotes local collective actions and political participation (Bellows and Miguel, 2009; Blattman, 2009). Our paper does not directly test for the impact of community exposure to violence on trust, and takes place in a country where conflict is still on-going. However, given how widespread violence is in Pakistan, conflict may play a role in explaining our results.

An important aspect of our results is that Liberal Universities under-estimate the trustworthiness of Madrassa students, suggesting that an important segment of the society has mistaken stereotypes about students in religious seminaries, while Madrassa students over-estimate the trustworthiness of Liberal University students. These incorrect stereotypes could negatively influence the social and economic interactions of those two groups outside of the lab. Moreover, since graduates of Liberal Universities are most likely to be future policy makers, their incorrect stereotypes could result in inefficiencies in society. Note that since our sample excludes outlier radical Madrassas (which, by definition, are hard to identify and recruit in practice), we do not know if these perceptions of non-Madrassa students are entirely inaccurate. Non-Madrassa students may form their perceptions based on outlier Madrassas, and their perceptions may correctly reflect how radical Madrassa students would behave. This is something we cannot rule out.

Overall, our findings offer some cautiously optimistic perspectives for Pakistan's future.<sup>48</sup> Of course, the high and non-discriminatory levels of trust we find pertain to highly educated groups. However, those groups are likely to be important actors in the economic activity of the country. Several African countries have experienced remarkable post-conflict economic recovery and one of the many channels may be that institutions, including trust, have improved as a result of the conflicts (Cramer, 2006). We can only hope that Pakistan will have a similar fate.

## Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.jebo.2015.03.020>.

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<sup>48</sup> Our results focus exclusively on interaction between males, but it is also of interest to understand how various segments of the society interact with women, particularly in Pakistan, where gender discrimination appears somewhat paradoxical. On the one hand, Pakistan has the most imbalanced sex ratio in the world but on the other hand, women have prominent political leadership. In Delavande and Zafar (2014), we present results of experiments where students were matched with females from Islamic Universities and Liberal Universities. We find that Madrassa students tend to discriminate against women. However, because they tend to give and trust more than any other male group, they actually treat women almost as well or better than other groups of males in the society. They simply treat men better than they treat women. We also find that there is interplay between the gender and social identity of the parties that interact.

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