Parental religiosity and human capital development: A field study in Pakistan[*]

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Abstract

In developing countries, a child's human capital development often depends on a trade-off between schooling and work. While the emphasis of religion on education means parents may place more importance on schooling, time-consuming religious activities by parents may require more work by their children to compensate. Given these countervailing forces, we conduct a field study in Pakistan to assess the impact of parental religiosity on a child's schooling and work. We find parental religiosity has a robust positive impact on a child's school outcomes and reduces their work activity, and parents with less time-consuming religious practices drive these results.

Key words: Religion, Human Capital.
JEL codes: Z12, I25, J13

1   Introduction

Parents play a fundamental role in the human capital development of their children. In so doing, parents influence micro outcomes, such as the long-term economic prospects of their own children, because of the impact of schooling on labor market outcomes. Moreover, parental decision making can also have a significant impact on macro outcomes, such as economic growth, because of the well-documented nexus between growth and levels of human capital. In general, how parents influence their children's human capital development can depend on the economic environment and non-economic individual characteristics. The impact of economic factors has been widely studied, but much less is known about non-economic characteristics. Religion is one potentially important non-economic factor, which has been identified as an important determinant of economic behavior and outcomes (see, e.g., Iannaccone, 1992; Glaeser and Glendon, 1998; Barro and McCleary, 2003; Guiso et al., 2003; Clingingsmith et al., 2009; De la Croix and Delavallade, 2018). However, while there is prior work linking religion to human capital in general (see, e.g., Becker and Woessmann, 2009), there is little prior research on the impact of a parent's religiosity on their children's human capital development.

Moreover, it is *a priori* unclear what impact we should expect a parent's religiosity to have on the human capital development of their children. On one hand, most of the prominent religious teachings in the world motivate individuals to place importance on gaining knowledge and acquiring education. For instance, in Islam, which provides the context for our study, the first word of the Quran is "read". Various sayings of the Prophet (*Hadith*) also highlight the importance placed on gaining knowledge such as "seeking knowledge is a duty upon every Muslim (and Muslimah) *(Sunan Ibn Majah)*", "the best gift from a father to his child is education and upbringing (*Al Tirmidhi Hadith Collection*)".[1] On the other hand, time engagement in costly religious activities may crowd-out other activities and investments, which may be important inputs into the process of human capital development.

In this paper, we study how parents' religiosity affects their children's human capital development in a developing country context. We believe that the developing country context is especially relevant because the impact of religion in daily life is arguably stronger in many developing countries and, at the same time, there are persistently poor levels of human capital

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[1]Several other sayings also reflect the spirit of the emphasis of education in Islam such as "seek knowledge from the cradle to the grave" or "seek knowledge even if it is far as China". Similar to Islam, almost all other religions also place value on educational attainment. For example, in Buddhism learning is essential to attaining enlightenment, in Hinduism learning is often viewed as an antidote to ignorance, in Judaism it is prescribed that parents educate their children, and finally in Christianity the emphasis on reading the bible has inherently placed great importance on learning among the believers. Consistent with this spirit, our follow-up survey data, which composes primarily of Muslim population, confirms that 90% of the parents' responded that their religious beliefs emphasize that education of their children is moderate to extremely important, with roughly 73 percent responded it to be extremely important.

accumulation.[2]

In general, a key challenge in studying the impact of non-economic variables on human capital development is the limited availability of data that links the religiosity of parents to their child's educational achievements. To overcome this challenge, Figlio et al. (2019) adapt an approach proposed in Fernández and Fogli (2009) where the outcomes of children of immigrants are linked to the predominant culture of their country of origin. This approach is valuable in a developed economy context but does not lend itself well to developing countries where immigration is essentially absent.[3] The developing country context also presents other challenges. First, relative to developed economies, non-economic factors, especially traditional measures of religion such as denomination, tend to be less diverse.[4] Second, in developing countries, children are frequently engaged in various types of work, which can be a substantial impediment to educational attainment and human capital development. In developing countries, parents therefore face a decision problem where human capital development is not limited to children's schooling but also considers their labor market participation. Therefore, to understand the role of non-economic factors shaping the dynamics of parents' decisions for human capital investment in developing economies, it is important to employ appropriate measures of religiosity and unify the human capital framework with the issue of frequent opportunities to engage children in work.[5]

To estimate the impact of religion, we conduct a novel parent-child linked survey in Kasur, Pakistan, which overcomes many of the challenges by directly linking parental characteristics to their own child's human development outcomes. The context of Pakistan naturally lends itself to our general question because of the poor educational outcomes, potential disinvestment in children's schooling because of employment in business enterprises and domestic chores, and the issue of low intergenerational social mobility, which other developing economies also face.

To measure non-economic characteristics, we use Koenig and Büssing (2010)'s DUREL measure for intrinsic religiosity and active engagement in religious activities. For each head of household (who is requested to be the responding parent), the measures of religion are linked to a wide range of their child's labor market participation measures using the survey of the parent and children and the schooling outcomes of the children utilizing administrative data. In particular, for the schooling outcomes we (i) access the results from a centrally set exam, which provides

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[2]For instance, a Gallup poll from 2008/2009 reported that a majority of respondents in developing economies said that religion was "important in [their] daily life".

[3]The UN International Migration Report 2017 shows that low-income countries received less than 5% of international migrants in the past two decades.

[4]The country based Religious Diversity Index (RDI) scores published by Pew Research Center calculates RDI by using the share of each country's 2010 population that belongs to each religious group. With few exceptions (such as Vatican City), the RDI score is less than 1 for low-income countries (mostly in Asia and Africa). Additionally, more than 80% of our sample, the parents identify themselves as Sunni Muslim. This data comes from the our follow-up survey.

[5]See discussions in Strulik (2004); Posso (2017); Thakurata and D'Souza (2018).

a standardized measure of school performance, and (ii) use school ledgers to measure school attendance. The labor market participation data allow us to capture a child's engagement in both paid and informal work (such as domestic chores), the latter being a predominant form of work in developing countries that is often unaccounted for in official data.

Our study also allows us to collect a large number of additional variables. First, we are able to collect a rich set of controls of household characteristics including income, age, education and cognitive ability of both the responding parent and child. Second, to control whether the affect of religion on human capital is driven by the correlation of religiosity and parental preferences that are relevant for human capital decisions, we use a range of incentivized experiments to collect time and risk preferences as well as a measure of parental altruism. The collected data, therefore, are uniquely suitable for studying the importance of a parents' religiosity on the human capital development of their children.

We find religiosity to be important for human capital development, with our measures of religion playing a role in both children's schooling outcomes and work activity. In particular, we find that religion has a substantial impact on schooling outcomes, with children of more religious parents being significantly more likely to pass the exam and significantly less likely to be absent from school. We also find that religiosity has a strong effect on work, with the children of more religious parents engaging significantly less in both economic and non-economic work activity. While it seems unlikely that our estimates suffer from reverse causation where child's outcomes drive parent's religiosity, we further confirm this absence of reverse causation using the instrumental variable approach adapted from Fruehwirth et al. (2019). However, religiosity may nonetheless be correlated with other unobservables. We mitigate such concerns using a rich set of controls including parent's age, education, cognitive ability, and preferences; household family income and size; and child's age, gender and cognitive ability. We also account for omitted variable bias using the methodology proposed by Oster (2019), and show that the effects are robust.

To shed light on the mechanism, we develop a simple conceptual framework which features parents maximizing their household consumption by allocating their own time across religious and work activities, and their child's time across schooling and work. This framework highlights the countervailing effects of the religiosity of parents. While religious parents may place more value on their child's schooling as prescribed by many religious teachings, if their religious practices involve time intensive activities then that may crowd-out their own time allocated to work, requiring their children to spend more time working to compensate. To test the relevance of these countervailing forces for explaining the impact of religiosity on human capital development, we conduct a heterogeneity analysis on the parents' religious practices. Consistent with the framework, we find the positive effect of religiosity on human capital outcomes depends on whether

the religiosity involves time-consuming activities or not. Moreover, we find parents who do not engage in religious activities are more likely to spend more hours at work, and engage more in household chores, leaving their children more time to concentrate on their education.

Our results make three important contributions to the literature. First, our results provide new evidence of the importance of religiosity in influencing economic outcomes. While the literature has found religion to be important for growth Barro and McCleary (2003), economic attitudes Guiso et al. (2003); Clingingsmith et al. (2009), and subjective well-being and earnings Campante and Yanagizawa-Drott (2015), we highlight a positive impact on human capital development through the impact of religiosity on parental decision making.

Second, our results provide evidence of a positive impact of religion on human capital development in a developing country context. While some prior work has found differing results on religion's impact on education depending on sample and religious denominations, we find a positive impact in our sample of low-income Muslim households. Moreover, our unique data set allows us to shed light on the mechanism behind our results and shows that the countervailing forces of a positive effect of religious teaching versus the time-consuming engagement in religious activity are likely to be key determinate of how religion impacts human capital.

Finally, we are the first to document that the religiosity of parents is not only linked to a child's schooling outcomes but also strongly linked to child labor market participation. This contribution is possible because, unlike the prior literature, we do not limit our data collection to schooling outcomes. Instead, we take a multifaceted approach to human capital development by including outcomes related to child labor participation, which often deprive children from acquisition of human capital in developing countries.

2   Related Literature

Our work contributes to two broad strands of literature. In this section, we highlight our contribution in relation to the literature focusing on human capital in developing countries and the effects of religiosity on human capital.

Human capital in developing countries: Economics has a long tradition of considering human capital accumulation of children as driven in large part by their parents. In particular, this notion of children being dependent agents and their parents making decisions is embedded in the theoretical models of Becker and Tomes (1979, 1986) and, in more recent work, Doepke and Zilibotti (2017), who highlight the importance of a parent's style of parenting in terms of their child's human capital and future economic success.

In developing countries, human capital accumulation is often made more complex by parents

having a choice between their child's schooling and child labor (see, e.g., Baland and Robinson, 2000; Strulik, 2004; Posso, 2017). While parents placing their children in school allows the children to accumulate human capital, having their children work provides contemporaneous consumption for their household but impedes human capital development (Thakurata and D'Souza, 2018). As a result, to understand the parents' human capital investment decision, one must unify the issue of education with the issue of parents in developing economies routinely engaging their children in work. Our paper contributes to the literature by considering the importance of the religiosity of parents to the joint schooling and work decision for their children.

The importance of parents as the decision maker for their child's human capital development in this setting has motivated empirical researchers to understand how parental characteristics (such as education and age), the child's own characteristics (such as gender and age) and, more generally, common household factors (such as income, assets and family size) influence the decision about the child's work and schooling. To construct the richest conditioning variables, we invoke the past literature and include characteristics for parents (Strauss and Thomas, 1995; Kurosaki et al., 2006; Emerson and Souza, 2007), children (Levison and Moe, 1998; Cartwright, 1999; Levison et al., 2001; Edmonds and Pavcnik, 2005), cognitive ability (Heckman et al., 2006; Burks et al., 2009; Borghans et al., 2010; Almlund et al., 2011) and household income (Hanushek, 1992; Patrinos and Psacharopoulos, 1997). The large number of factors illustrates the importance of having a large number of control variables when studying human capital. A key advantage of our survey is that it allows us to gather information and control for these factors when considering the importance of religion on human capital.

Religion and Human Capital: While there is little prior work linking a parents religiosity to the human capital development of their children, there is work that has studied the relationship between religion and education. One prominent strand is based around findings that children from Catholic schools in the US tend to outperform similar children in other schools Coleman et al., 1982; Evans and Schwab, 1995; Neal, 1997; Ewing, 2000). These results have led to an influential theory of how religion positively impacts human capital development based on the idea that that religion improves schooling through its affect on social capital (e.g. Coleman, 1988). In contrast, another stand of the literature finds worse outcomes among more extreme religious observers. Berman (2000) finds that ultra-orthodox Jews in Israel have worse levels of education and relates these findings to Iannaccone (1992) influential theory of religious clubs. Iannaccone (1992) himself provides evidence for extreme sects within Christian denominations and Berman and Stepanyan (2004) finds evidence for Islam. While this literature points to the importance of religion on education it does not directly consider how the individual religiosity of parents impacts their human capital investment decisions for their children. Our paper adds to the litera-

ture by looking at a how parent's religiosity effects the human capital outcomes of their children, when these outcomes include both schooling and work activity.

3   Conceptual framework

In this section, we develop a simple conceptual framework that we believe captures the essence of the potential impact of parent's religiosity on their child's schooling outcomes and work activity in a developing country context.

Consider a parent that makes the time allocation decisions for the household, with, for simplicity, the household consisting of one parent and one child. The parent can allocate a fraction, $l_p \in [0, 1]$, of their own time to working to earn a wage w_p. To reflect the developing country context, we also allow the parent to allocate a fraction, $l_c \in [0, 1]$, of the child's time to work for a wage w_c. Parents care about household consumption c, which they finance using the income earned both by themselves and their child: $c = w_p l_p + w_c l_c$.

The time allocation problem has two additional features. First, the parent finds it important to devote time to participating in religious activities. In their seminal work on the theory of religious participation Azzi and Ehrenberg (1975) suggest three reasons why people participate in religious activities: (i) they view their expected afterlife well-being as related to their participation, (ii) they derive current satisfaction from participation because of their religious beliefs or purely social reasons, and (iii) social pressures in a community may suggest that religious activities will increase an individual's economic success. Based primarily on (ii), we assume that the parent derives utility from the time, $r = 1 - l_p$, they allocate to religious activity. Second, time spent by the child working takes time away from schooling and therefore affects educational performance. Following Banerjee (2004) we assume the parent derives utility from their child doing well academically, and therefore cares about their child' schooling performance, which is a function of how much time the child spends on schooling s: $g = g(s) = g(1 - l_c)$.

The parent therefore maximizes the following utility:

$$U(c, r, g) = U(w_p l_p + w_c l_c, 1 - l_p, g(1 - l_c)). \tag{1}$$

There are two potential sources of heterogeneity in the utility function (1) that are related to religion. First, there is potential heterogeneity in the utility parents derive from participating in religious activities. The DUREL survey (Koenig and Büssing, 2010) we use for our analysis is specifically designed to accommodate that people may have differences in the way they follow religion, with questions that measure engagement in religious activity and separate questions about personal religious beliefs. Second, there is potential heterogeneity in how much utility

parents derive from their child's having good educational outcomes. In particular, since most religions place importance on gaining knowledge and acquiring education, more religious parents may derive higher utility when their child does well in school.

To illustrate how these two effects of religion impacts a child's school performance, g, and work activity, l_c, let $w_p = w_c = 1$, $g(s)$ be linear, and utility (1) have the constant elasticity of substitution (CES) form:

$$U(c, r, g) = [\alpha_1(l_p + l_c)^\rho + \alpha_2(1 - l_p)^\rho + \alpha_3(1 - l_c)^\rho]^{\frac{1}{\rho}}, \tag{2}$$

where $\rho < 1$ is the substitution parameter and α (with $\alpha_1 + \alpha_2 + \alpha_3 = 1$) is a relative share parameter that provides a measure of the relative importance to the parent of household consumption (α_1), their engagement in religious activity (α_2), and their child doing well in school (α_3).

Proposition 1

i) *The work activity of the child l_c is increasing in the relative importance to the parent of engaging in religious activity α_2 and decreasing in the relative importance to the parent of their child doing well in school α_3.*

ii) *The school performance of the child g is decreasing in the relative importance to the parent of engaging in religious activity α_2 and increasing in the relative importance to the parent of their child doing well in school α_3.*

Proof. See Appendix 8. ∎

The intuition behind Proposition 1 goes as follows. If a parent derives relatively more utility from engaging in religious activity they will spend more time on religious activities and less time working, and the child therefore needs to work more to compensate. As a result, l_c increases and the child's school performance g suffers because school performance is negatively related to the child's work activity. In contrast, a parent who derives relatively more utility from their child's education will have the child spend less time on work, decreasing l_c and improving school performance g.

Proposition 1 implies that the overall impact of a parent's religiosity on their child's schooling outcomes and work activity is unclear as it depends on two countervailing forces. On the one hand, a more religious parent may put more weight on a child's education, reducing their incentive to have their child work, which improves their child's school performance. On the other hand, a more religious parent may put more weight on engaging in religious activity, reducing their time available to work, and requiring their child to pick up some of the additional work. This increased work activity by the child worsens their school outcomes.

In this study, we therefore test if parent's religiosity has a positive or negative impact on a child's school performance and work activity, focusing on how the heterogeneity in a parent's religious practices affects the impact of religiosity on children's work and schooling outcomes.

4 Sample and Data

Our dataset includes 1416 parent-child pairs and contains information about each child's engagement in economic and non-economic work activity, time spent working, their performance in a centrally set exam conducted at the end of primary school for transfer to the middle school and children's school attendance. For parents, it includes their work activity, work hours, and time allocation on other activities such as child care. Finally, the data includes a broad range of both conventional and novel characteristics of the child, parent(s) and household. In this section, we describe the sample selection and discuss the sources of the collected data.

4.1 Sample selection

We acquired parents' contact information from school records and restricted the sample to public schools. In Pakistan such schools are almost exclusively used by low-income households and, as we also find, having children do some form of work is commonplace in this population, and there is therefore an important trade-off between work and schooling in our sample. The children (median age 12) were in the final year of primary school education (grade 5) and conditional on passing a central exam would transition to middle school.[6] To facilitate data collection we further restricted the sample to schools for which the transition for the students was possible within the same school, which is common in Pakistan. We concentrated on peri-urban localities (often referred to as rural/urban areas) of the Kasur district in Punjab.[7] This process left a pool of 45 schools from which we selected the sample. We selected 32 schools, where the probability of a school being chosen for our sample increased with the number of students in grade 5.[8]

We then took all students at these 32 schools enrolled in grade 5 (in February 2018) and that were due for transition to middle school (grade 6) at the start of April 2018 after taking the centrally set exam. In April, with the school's cooperation, we accessed the school records for the previous academic year, the current academic year and collected addresses for the parents of students enrolled in one of the sampled schools during the previous academic year (i.e., prior to the

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[6]In the Online Appendix, we provide a brief institutional background about the public school system in Pakistan.

[7]We choose the district of Kasur in Punjab because the average level of various development indicators (such as school drop-out rates, monthly income of employed, population involved in agriculture, youth labor market participation and crime rate) in Punjab are closest to those observed in Kasur.

[8]The distribution of these schools by grade and gender is provided in Table B1.

transition). We then collected information using parent-child pair surveys during the period from April to June 2018. The total number of observations collected is 1506, and 90 of these observations are parental variables collected from non-parental guardians of the child. We exclude such children and base our study on the sample of 1416 parent-child observations.

4.2   Data

The data were obtained from three sources: administrative data collected from school and government records, data from surveys conducted separately for parents and children, and a follow-up survey of parents.

Administrative data from schools and government records: To provide a measure of school performance we collected the central exam result for each child by accessing administrative data collected by the government of Punjab. Successfully passing the exam is required for all children in Pakistan at the end of primary school to enable their transition to middle school and therefore represent the culmination of five years of school work. The fact that exam is centrally set and the exam questions are therefore uniform across all students is vital for our study as only standardized measures of school performance allow for meaningful conclusions (see, e.g., Gunnarsson et al., 2006; Baird et al., 2011; Dumas, 2012).

We were able to uniquely match 1272 students from our sample of 1416 children, using the school name, father's full name and child's full name. We remove the students who were absent during the exam (but this was a small number of 13 students). We then construct a dummy variable for passing the exam, which required a minimum of 33% of the score for each of five subjects – English, Islamic studies, Urdu, Science and Mathematics.[9]

School performance provides an measure of the output of a child's time in schooling. To also provide a measure of a child's time input to education we accessed school ledgers from all the schools in our sample, which contain information on each child's attendance over the previous academic year. As argued by Baird and Özler (2012), school ledgers should be regarded as the benchmark measure of attendance as self reported school participation may be subject to bias. Together with our exam results we therefore also use a robust independent measure of the child's time input into schooling by including their school attendance derived from school ledgers.

Parent-child linked survey data: Our surveys for each parent-child pair include two parts. The first part contains incentivized tests. For parents, this part includes an incentivized standard

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[9]We opt for the passing of the central exam as our outcome variable because the final score of the student is denoted as *fail* without the total score achieved by the student if the student did not manage 33% of the score for each of the subjects. Inherently the largest variation in marks is due to the pass/fail criterion, and therefore we use the binary variable of 1 if the student passes the exam, and 0 otherwise. Nevertheless, qualitative results with marks are very similar to those of pass.

Raven's test to collect information on their cognitive ability and a range of standard incentivized experiments to elicit discounting, risk aversion and altruism.

The second part involves survey questions. For parents, the survey contained questions to elicit their religiosity using the Duke University Religion Index (DUREL) which divides religious practices into three dimensions (Koenig and Büssing, 2010). In particular, a dimension of intrinsic religiosity (IR) measures subjective religiosity, and assesses the degree of personal religious commitment or motivation. Active participation in religious activities is divided into organized religious activities (ORA) and non-organized religious activities (NORA). While ORA involves public religious activities, such as attending religious services or participating in other group-related religious activity (prayer groups, Quran study groups, etc.), NORA consists of religious activities performed in the home, such as prayer, Quran study, watching religious TV or listening to religious radio.

Along with religiosity, the survey of the parents also provides information on a standard control variables (such as parental education, income, age, household size, child's age and gender) and information on their time spent on both economic and non-economic work. Moreover, we also derive our main child work variables using the survey of the parents. No consensus exists on whether it is better to ask parents or the child about the child's work activity and while Dillon et al. (2012) find little difference between work reported by children and their guardians, both Dammert and Galdo (2013) and Janzan (2018) find the reports inconsistent in a significant number of cases. We take the following approach. For questions regarding types of work (extensive margin), we ask the child's guardian, as we believe they are well suited to answer what type of work their child does for them, whereas for the hours of work (intensive margin), we ask the children themselves, as we believe they are best suited to answer how they typically spend their days.

For children, the first part of the survey includes an incentivized colored Raven's test to measure their cognitive ability. The second part involves the survey questions to collect information about their allocation of hours to work in a typical day. In the Online Appendix, we further elaborate the protocols and payments made to parents and children for their participation in the study.

Table 1 gives the mean and standard deviation for dependent variables for the full sample as well as for males and female child separately. Table 2 gives the mean and standard deviation for the independent variables.

Follow-up survey: In the existing survey, we collected information about parent's own allocation of time between work and household chores. However, the survey lacked information about the parents' religious denomination, whether their religion places emphasis on education of their child, their direct involvement in child's daily life, and the involvement of other parents in their child's education. To be able to gather this missing information, we conducted a follow-up tele-

Table 1: Summary Statistics - Dependent Variables

	All Sample	Females	Males
	(1)	(2)	(3)
Pass	0.93	0.97	0.90
	(0.25)	(0.17)	(0.30)
Absence	0.68	0.75	0.62
	(1.11)	(0.89)	(1.27)
All Work	0.75	0.73	0.77
	(0.43)	(0.44)	(0.42)
Economic Activity	0.28	0.23	0.32
	(0.45)	(0.42)	(0.47)
Household Chores	0.74	0.72	0.76
	(0.44)	(0.45)	(0.43)
Work Hours	1.89	1.78	1.97
	(1.37)	(1.38)	(1.36)
N	1416	655	761

Note: This table provides mean and standard errors. Standard errors are in parenthesis. All Work, Economic Activity, Household Chores and Pass are binary variables while remaining variables are continuous.

Table 2: Summary Statistics - Independent Variables

Control–Parents	mean (sd)	Control–Family	mean (sd)	Control–Child	mean (sd)
Edu(Father)	0.34	Family-size	6.97	Age(child)	12.35
	(0.47)		(1.39)		(0.90)
Edu(Mother)	0.15	HH Income (PKR/month)	12321.96	Female	0.46
	(0.35)		(9283.7)		(0.50)
Age(Father)	43.43	HH Income Missing	0.22	Raven(child)	17.24
	(6.65)		(0.41)		(5.36)
Age(Mother)	38.92				
	(6.20)				
Raven(parent)	21.92				
	(9.15)				
Religiosity Index	mean (sd)	Behavioral Preferences	mean (sd)	Additional Control	mean (sd)
Religiosity	0.91	Discounting	0.19	Scared	4.20
	(0.089)		(0.15)		(1.01)
Intrinsic Religiosity	4.65	Risk loving	-0.092	Walk	0.93
	(0.38)		(1.2)		(0.25)
Non-organized religious Act	4.55	Altruism	0.57		
	(0.90)		(0.49)		
Organized religious Act	4.26				
	(1.02)				
N	1416		1416		1416

Note: This table provides mean and standard errors (in parenthesis) for the control variables variables.

phonic survey with parents in the summer of 2020 primarily to collect this information. To be able to increase the rate of response, we designed the module to be brief with yes and no questions. As a result, we were able to collect observation for roughly 70% (980 parents) of our sample. We use this sub-sample to construct a measure of whether the parent is an involved parent or not.

5   Econometric Model

Inline with our conceptual framework, we model outcome variables denoted by Y_{is} for child i who goes to school s in equation 3:

$$Y_{is} = \beta_0 + \beta_1 *\ Rel_{is} + \gamma_x *\ X_{is} + \alpha_s + \mu_{is}, \quad i = 1 \ldots N \tag{3}$$

where α_s is a school-specific error term and μ_{is} is an idiosyncratic error term that may be correlated across students in school s, depending on the sampling scheme.

Our control variables (X_{is}) include a battery of variables for the parents. We start with the binary variable of education status denoted by $Edu(Father)$ and $Edu(Mother)$, both of which take a value of 1 if, respectively, the father and mother of the child are educated.[10] We also include variables for the ages of the father and mother, denoted by $Age(Father)$ and $Age(Mother)$, respectively. To account for differences in innate abilities, we conduct incentivized Raven's standard progressive test for parents and Raven's colored progressive test for children (Raven et al., 1938), and include the cognitive ability of the responding parent denoted by $Raven(parent)$ and child $Raven(child)$. Moreover, for the child, our set of variables also includes age, gender and cognitive ability, denoted respectively by $Age(child)$, $Female$ (coded as 1 if the child is female). Finally, for household variables, we include family size denoted by $Family-size$ and the income of the household denoted as $HH\ Income$. Zero family income is reported for one-quarter of the sample, but such responses may not be accurate given that more than 98 percent of the respondents also report their labor status as employed. However, similar to Fruehwirth et al. (2019), we address this issue by replacing non-reported or zero income with zero and including a dummy for missing income to avoid any systematic attrition of the data that could impact the results.

In addition, we also use control variables which would otherwise be omitted variables and can bias our estimate. The two set of additional control variables are motivated by the local context and the theoretical links shown to matter for children's schooling outcomes. The first control variables pertains to the parent's safety concern of their children attending school in light of the

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[10]The reason we use binary variables instead of the level of education is that in our sample, 66% of the fathers and 85% of the mothers are uneducated. As a result, most of the variation is captured by this binary version of the variable.

recent terrorist-linked activities targeting school. For this we include a variable asking parent's level of concern for their child's school being a target and denote it as $Scared$. Since theoretically, Muralidharan and Prakash (2017) shows that the distance between home and school is an important variable for child's participation in school, we include a variable $Walk$ to ask whether the child walks to school to assess the proximity of school. Last we include behavioral factors of parent's discounting of future denoted by $Discounting$, risk loving behavior $risk\ loving$ and their altruism denoted by $altruism$ towards their child to explore whether the impact of religiosity is instead driven by these behavioral variables which are often modeled in the literature (such as Baland and Robinson (2000)) focusing on parent's decision to engage their children in work activities.

For our explanatory variables of interest, we construct a measure of religiosity Rel which is composed of three dimensions of the DUREL measure of religiosity adapted from Koenig and Büssing (2010). These dimensions are constructed using the items based on a Likert scale: the first pertains to the average response from three questions about deeper religiosity $Intrinsic$ (however, we also use the separate questions in a robustness exercise) and the second captures the response on a question about engagement in private religious activities $Non - organized\ religious\ Act$ and lastly the third captures outwardly religious activities, denoted by $Organized\ religious\ Act$.[11] While the last measure is the most time-consuming religion because of engaging in religious practices in a public sphere (such as praying at a mosque would require walking/commuting to the mosque)[12], the other two measures of religiosity are less costly, with the intrinsic religiosity having the least cost in practicing religion.[13] In the absence of these distinctions, our variable Rel is constructed by aggregating all the responses and normalize the total score for each parent by the maximum possible score. This measure ranges from 0 to 1, and provide a simple interpretation that if Rel is high, the parent is more religious. However, as posited in our conceptual framework we explore whether the distinction across religiosity in terms of the time-cost plays an important role in the differential impact of religion on children's outcomes.

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[11]In particular, intrinsic religiosity (IR) measures assess the degree of personal religious commitment or motivation and contains the following three questions: In my life, I experience the presence of Allah; My religious beliefs are what really lie behind my whole approach to life; I try hard to carry my religion over into all other dealings in life. NORA consists of religious activities performed in the home, such as prayer, Quran study, watching religious TV, and asked the following question: How often do you spend time in private religious activities, such as prayer, or Quran recitation? Finally ORA involves public religious activities, such as attending religious services or participating in other group-related religious activity (prayer groups, Quran study groups, etc.) and asks the following question: How often do you attend mosque or other religious meetings?

[12]One potential motivation behind this form of religiosity pertains to the mechanism of signaling to others about one's religiosity.

[13]In contrast to organized religious activities, there is no signaling involved with the non-organized and intrinsic religiosity.

Our outcomes include binary and continuous variables for schooling and work. The binary variables for schooling performance called $Pass$, which is coded as 1 if the child passed the national exam and 0 otherwise. The continuous schooling participation variable is absence which is the total number of days a child is absent from the school in an average month and is denoted by $Absence$. For work outcomes, the binary variables include $Work$, which is coded 1 if the child worked in any fashion (including economic activity, and household chores) and 0 otherwise. We further disaggregate $Work$ into work categories: $Economic\ Activity$, which is coded 1 if the child worked formally or informally in a family enterprise and 0 otherwise, and $Household\ Chores$, which is coded 1 if the child conducted household chores for free and 0 otherwise.[14] Finally, we include the hours of work a child spends on various work activities, and it is denoted by $Work\ Hours$.

We further investigate how to treat the school-specific error terms with respect to estimation and calculating standard errors. If going to school s affects outcome Y_{is} and is correlated with the other explanatory variables, then β_1, γ_x will potentially be biased unless we include school fixed effects. For example, consider the β_1 on the religiosity variable. This variable can be transmitted to the students though their parents or through the relevant institutions, e.g., schools. School dummies allow us to separate the transmission through schools and our main variables of interest. In other words, with the fixed effect specification, we simply compare children within the same school, which removes numerous aforementioned institutional differences across neighborhoods.

6   Results

As outlined in our conceptual framework in Section 3, the impact of the religiosity of parents on their child's schooling outcomes and work activity can go in either direction. On the one hand, the religious activities of parents can take time away from work which the child needs to compensate by working more, reducing their time for schooling and therefore negatively affecting their schooling outcomes. On the other hand, religious parents may value schooling outcomes more since religion places importance on education, and parents therefore require less work from their child to allow the child to focus more on school.[15] Due to these countervailing effects, we first report, in Section 6.1, estimates of the effect of parental religiosity on child's schooling and work related outcomes, using specification 3. In the next section, we explore the potential channel of

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[14]For binary outcomes, the regression specification takes a probit form and is as follows:

$$P\left(Y_{is}{=}1|X_i\right) = \Phi\left(\beta_0 + \beta_1 * Rel_{is} + \gamma_x * X_{is}\right),$$

[15]The follow-up survey data show that 90% of the parents believe that their religion places moderate to extreme importance on educating their children.

whether the type of parent's religious practices can rationalize the estimated effects of religiosity on child's work and schooling decisions.

6.1 Effects of Parental Religiosity on Child's outcomes

In Table 3 we summarize the point estimates and the standard errors. We also report the margins for probit regressions (for binary outcomes) to facilitate quantitative interpretation. In appendix Table A1, we provide the full regression table.

Table 3: Impact of Religiosity

	Pass (Y/N)	Absence	All Work (Y/N)	Economic Activity (Y/N)	Household Chores (Y/N)	Work Hours
	(1)	(2)	(3)	(4)	(5)	(6)
β	2.10**	-0.78**	-2.09***	-1.56***	-2.16***	-1.46***
s.e	(0.89)	(0.36)	(0.52)	(0.56)	(0.52)	(0.45)
Margin	⟨0.35⟩		⟨-0.56⟩	⟨-0.34⟩	⟨-0.59⟩	
Margin (1 std)	⟨0.31⟩		⟨-0.50⟩	⟨-0.30⟩	⟨-0.53⟩	
N	559	1246	1319	1165	1316	1180

As can be seen in Table A1 in the appendix, the effects of our control variables are consistent with the past literature showing that parental education has a positive influence on child's schooling (Kurosaki et al., 2006; Emerson and Souza, 2007). With respect to the child's age, our results are consistent with those reported in Cartwright (1999), where the child's probability of work increases with age. One novel feature of our control variables is the addition of the cognitive ability of both the child and their responding parent, which accounts for non-observables frequently missing in the literature. Similarly to Heckman et al. (2006), we find that one's own cognitive ability improves schooling outcomes. Moreover, we show that parental cognitive ability is mostly responsible for inhibiting the likelihood that a child engages in work.

Our results show that religiosity of parents affects both the schooling and work related outcomes of their child. In particular, there is an approximately 30% higher chance that a child passes the central exam if the parent has a one standard deviation higher level of religiosity.[16] The effect also translates into 0.78 less days missed from school in an average month for a more religious parent. Moreover, a one standard deviation higher parental religiosity reduces the chance of the

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[16]Note that the number of observations for the $Pass$ variable is smaller than those for the other variables. This is because we use school fixed effects and when there is no variation in the schools pass, the observations are simply omitted from the analysis. In the next section, where we also employ the random effects model, the number of observations are comparable to those for $Absence$.

child engaging in any type of work by 50%, which is driven by a reduction in the chance of economic activity of 30% and a reduction in the likelihood of household chores of 53%. The effect of a one unit increase in this measure also reduces the number of work hours per day by 1.5 hours.

Since the public schools in Pakistan are segregated by gender, using the fixed effect specification does not allow us to estimate the effect of gender of the child. However, the past evidence provided in Edmonds and Pavcnik (2005) show that gender plays an important role in which type of work activity a child may be involved in. For example, household chores inside the house are more likely and outside work is less likely for a girl and the opposite is true for a boy. However, in terms of schooling, it is often posited that in developing countries the gender inequality starts early, where girls are often locked out of the schooling opportunities. We, therefore, study whether parental religiosity affects certain child outcomes more so than others depending on the gender of the child. To do so, we split the sample of children into female and males and re-estimate the specification 3 with all the control variables mentioned.

In Table 4, we summarize our results[17] which show that the heterogeneity across child's gender is not stark but the few differential effects we see are broadly consistent with the context of developing economies. First, there is some evidence that schooling outcomes for both boys and girls are related to their parent's religiosity but absence is affected by parent's religiosity for boys and not for girls. However, the estimated effect for girls goes in the same direction, though insignificant. We also see that the relation between religiosity and household chores is significant for a girl while both household chores and economic activity show negative impact of religiosity for a boy. Since a female child is more likely to be engaged in household chores, the effect of religiosity may only be constrained to this type of work. However, for boys the impact is significant for economic activity as well. In summery, while there are some differences across gender, overall the parent's religiosity impacts schooling and work outcomes for both genders.

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[17]Full table with estimates for the control variables is presented in Table A2–A3

Table 4: Impact of Religiosity for Females and Males

Female	Pass (Y/N)	Absence	All Work (Y/N)	Economic Activity (Y/N)	Household Chores (Y/N)	Work Hours
	(1)	(2)	(3)	(4)	(5)	(6)
Religiosity	6.88**	-0.28	-2.56***	1.17	-2.56***	-1.08
	(3.03)	(0.49)	(0.88)	(1.13)	(0.88)	(0.74)
	⟨0.96⟩		⟨-0.68⟩	⟨0.23⟩	⟨-0.68⟩	
N	157	559	606	529	606	522

Male	Pass (Y/N)	Absence	All Work (Y/N)	Economic Activity (Y/N)	Household Chores (Y/N)	Work Hours
	(1)	(2)	(3)	(4)	(5)	(6)
Religiosity	1.73*	-1.05**	-1.73***	-2.65***	-1.84***	-1.53***
	(1.00)	(0.51)	(0.66)	(0.66)	(0.66)	(0.58)
	⟨0.29⟩		⟨-0.46⟩	⟨-0.58⟩	⟨-0.50⟩	
N	402	687	713	636	710	658

6.2 Robustness

We now proceed to a number of alternative specifications, where we first discuss potential issues that may impact our baseline results and then conduct additional analyses to show robustness of our baseline results. We present these robustness analyses in Table 5-7 which show remarkable similarity of the estimates to the ones presented using our baseline specification.

Table 5: Impact of Religiosity

	Pass (Y/N)	Absence	All Work (Y/N)	Economic Activity (Y/N)	Household Chores (Y/N)	Work Hours	Pass (Y/N)	Absence	All Work (Y/N)	Economic Activity (Y/N)	Household Chores (Y/N)	Work Hours
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Scared	0.034	-0.037	-0.030	-0.062	-0.033	-0.061						
	(0.084)	(0.031)	(0.044)	(0.047)	(0.044)	(0.039)						
Walk	-0.44	-0.41***	-0.72***	-0.32	-0.72***	-0.33**						
	(0.45)	(0.13)	(0.21)	(0.20)	(0.21)	(0.16)						
Discounting							-1.04	-0.0036	1.07***	-0.28	1.10***	0.68**
							(0.72)	(0.21)	(0.34)	(0.42)	(0.34)	(0.30)
Risk Loving							0.14	0.016	-0.045	0.10*	-0.047	-0.034
							(0.099)	(0.027)	(0.045)	(0.055)	(0.045)	(0.039)
Altruism							0.29	0.018	-0.22**	-0.34***	-0.19*	-0.16
							(0.21)	(0.067)	(0.11)	(0.13)	(0.11)	(0.096)
Religiosity	2.25**	-0.65*	-1.95***	-1.46***	-2.02***	-1.34***	2.64**	-0.33	-2.26***	-1.70***	-2.35***	-1.79***
	(0.91)	(0.36)	(0.52)	(0.56)	(0.53)	(0.45)	(1.06)	(0.34)	(0.58)	(0.65)	(0.58)	(0.50)
N	559	1246	1319	1165	1316	1180	434	1034	1096	934	1094	983

We first start with the estimation where we include additional control variables to explore whether the coefficients estimated in the last section are driven by variables which are traditionally unobservable or omitted, but can bias our estimate for religion. Given the theoretical link between child security and distance to schools as investigated in (Muralidharan and Prakash, 2017), we elicited from parents as to how much terrorist targeting the school concerns the parents. This question is important in the context of Pakistan since it has recently witnessed terrorists attacking schools which may feed into parents' decisions on whether to send children to school or engage in outside household chores and economic activity. Relatedly, we also collected data on the mode the child uses to commute to school, which allow us to proxy for more local safety concerns and the transportation cost to the school. In results shown in columns (1)-(6) in Table 5, we find that on their own the concerns of terrorism in school does not significantly impacts a child's outcomes, however whether the child walks to school or not has an impact as theorized in the literature. The closer the school is, the more likely it is that the child attends school and less likely to participate in work activity. However, despite the importance of this variable, the estimated impact of religiosity is unaffected when we include these additional control variables, which confirms that the additional control variables do not seem to bias our estimates for religiosity.

Additionally, the decision to invest in education rather than having children work may also be influenced by behavioral preferences of parents. To guide our analysis as to which variables are traditionally important in our context, we invoke theories of child labor that routinely have intertemporal investment (i.e., time discounting) and parental altruism as common features (Baland and Robinson, 2000; Ranjan, 2001; Dessy and Knowles, 2008; Kumar, 2013), and models of human capital and wealth accumulation (Doepke and Zilibotti, 2008; Dohmen et al., 2015) that feature time discounting and risk aversion. Parental altruism is also important in the seminal work of Becker and Tomes (1979) as well as Basu and Van (1998). Moreover, it is often argued that these preferences may be affected by a person religiosity (Iannaccone, 1998).

To investigate if these additional behavioral factors impact our estimate for parent's religiosity, we include the degree of impatience ($discounting$), willing to take on risk ($risk\ loving$) and parents' selfless concern for their child's well-being ($altruism$), to our specification. All these measures were elicited using incentivized experiments. While the first two preferences are continuous measures, altruism is a dummy variable that take a value of 1 for an altruistic parent. We provide additional details for our design for these experiments in the Appendix and present these results in columns (7)-(12) in Table 5. We find that while the effects on pass or absence do not show any evidence of significant association to these behavioral factors of parents, child's work participation is reduced when the parent is patient and altruistic. However, as with other additional variables, the evidence that the child of a religious parent performs better at school and is

less likely to participate in work activity remain robust to including these additional behavioral factors.

To further ensure that unobserved variables do not bias our results, we tackle this issue by employing the methodology of Oster (2019) and also estimate a bias-adjusted coefficient for each of our variable of interest. This method allows us to study whether the degree of selection on unobservables can fully confound the estimates.[18] In Table 6 we present the results from this exercise and show that the sign of the religiosity coefficient for all of the outcome variables stay the same when we allow for selection on unobservables.

Table 6: Omitted Variable - Impact of Religiosity

		Omitted Variable Bias					
	Pass(Y/N)		**Absence**			**All Work(Y/N)**	
	β	Switch	β	Switch		β	Switch
OLS	0.18		-0.78			-0.42	
Bias-Adjusted	0.18	No	-0.95	No		-0.60	No
	Economic Activity(Y/N)		**Household Chores(Y/N)**			**Work Hours**	
	β	Switch	β	Switch		β	Switch
OLS	-0.32		-0.63			-1.46	
Bias-Adjusted	-0.41	No	-0.62	No		-1.49	No

While we use a rich and complete set of background variables and additional variables (such as variables for local context, behavioral factors and raven score of parents) in our analysis to limit the extent to which our estimates are affected by omitted variable bias, adding a rich set of controls can itself pose an issue by over-saturating the statistical model. In an alternative specification in Table 7 (columns 2, 7 and 12), we also show that the limited vector of control variables does not alter our main results.

Table 7: Robustness - Impact of Religiosity

Robustness: Impact of Religiosity															
	Pass(Y/N)					**Absence**					**All Work(Y/N)**				
	(1) Baseline	(2) Less Controls	(3) IV	(4) RE	(5) Cluster	(6) Baseline	(7) Less Controls	(8) IV	(9) RE	(10) Cluster	(11) Baseline	(12) Less Controls	(13) IV	(14) RE	(15) Cluster
Religiosity	2.10**	1.81**	2.19**	1.93**	1.93***	-0.78**	-0.73**	-0.81**	-0.80**	-0.80**	-2.09***	-2.24***	-1.60***	-2.05***	-2.05*
	(0.89)	(0.88)	(1.07)	(0.84)	(0.69)	(0.36)	(0.36)	(0.40)	(0.36)	(0.39)	(0.52)	(0.51)	(0.62)	(0.50)	(1.08)
N	559	559	559	1174	1174	1246	1246	1246	1246	1246	1319	1319	1319	1319	1319
	Economic Activity(Y/N)					**Household Chores(Y/N)**					**Work Hours**				
	(1) Baseline	(2) Less Controls	(3) IV	(4) RE	(5) Cluster	(6) Baseline	(7) Less Controls	(8) IV	(9) RE	(10) Cluster	(11) Baseline	(12) Less Controls	(13) IV	(14) RE	(15) Cluster
Religiosity	-1.56***	-1.56***	-3.04***	-1.38**	-1.38	-2.16***	-2.29***	-1.65***	-2.12***	-2.12**	-1.46***	-1.50***	-1.11**	-1.77***	-1.77**
	(0.56)	(0.56)	(0.66)	(0.54)	(0.95)	(0.52)	(0.52)	(0.62)	(0.51)	(1.08)	(0.45)	(0.45)	(0.50)	(0.44)	(0.87)
N	1165	1165	1165	1325	1325	1316	1316	1316	1316	1316	1180	1180	1180	1180	1180

The issue of reverse causation may make it challenging to attribute the impact on child's outcome to religiosity of parents. To mitigate the concern about reverse causation, we adapt the

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[18]In this method, Oster exploits information on both the movements in the R square and the movement of coefficients when additional controls are added. With this, we can estimate the omitted variable bias-adjusted coefficients for religiosity. However, this method is only applicable for linear model specification.

approach of Fruehwirth et al. (2019) of constructing an instrumental variable for the religion of individual i using survey response questions on religion from a close friend. In particular, the authors use the average religiosity of peers (excluding oneself) of the same school, grade, race, gender, and denomination. However, our instrument is simpler as we use the religiosity of all the parents of peers within the school (excluding oneself). This choice is made for two reasons. First, our design aims to construct a homogeneous sample since all our children are from the same grade and school, the schools are gender segregated, unlike developed economies, race is relatively homogeneous in a district, and finally the religious sects are not diverse or heterogeneous in our sample.[19] Second, because we use parental religiosity instead of a child's own religiosity, we believe that our instrument is akin to the logic of one of the exercises conducted in Fruehwirth et al. (2019), where due to concerns with the endogeneity of denomination, individual i's religious denomination is replaced with the parent's denomination both as a control variable and to define the close peer group for the instrument.[20] Using the adapted version of the instrument for religiosity variables, our estimated first stage regression gives F-statistics, which are the Wald version of Kleibergen and Paap (2006), in the range of 20 to 140, indicating that we do not have a weak instrument problem. Using an IV specification instead, our conclusions stay unchanged (columns 3, 8 and 13).

To reiterate as our baseline specification we estimate a fixed effect specification. In most contexts, using school fixed effects would be the preferred path, as one sacrifices some efficiency/statistical precision but insures against the above biases. However, in our case, the trade-off is different since our schools are segregated by gender, and using school fixed effects precludes directly measuring gender effects. While we use the fixed effect model as our baseline specification, we also estimate the regression using random effects as part of the robustness exercise, where we include the gender of the child as an additional covariate (see columns 4, 9 and 14).[21]

In the random effect specifications, we must consider whether we need to adjust the standard errors for correlation across students at the same school. If we follow the traditional path suggested by Moulton (1986, 1990), we would allow for this correlation in calculating the standard errors. However, recent work by Abadie et al. (2017) demonstrates that such clustering is not always necessary and that using it unnecessarily leads to overly conservative standard errors and confidence intervals.[22] Nevertheless, in an additional robustness exercise (columns 5, 10, and

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[19]More than 80% of our sample, the parents identified themselves as Sunni Muslim. This data comes from the follow-up survey. See Figure A1.

[20]The validity of instrument can be questionable if the religiosity of the parent's of the child's peers directly impacts child's human capital. This may occur if parent's of child's peers get involved in child's schooling activities. However, in the follow-up survey we asked how often parents of other children in school get involved with your child's education or educational activities, and 93% of the parents responded never. We therefore do not believe that such concerns invalidate our instrumental strategy.

[21]For the same reason, we also presented the effects of religiosity for female and male children in Table 4.

[22]In Abadie et al.'s setup, one first calculates the fraction f_c of all possible clusters used in the sample; in our

15), we cluster the standard errors to show that our results are mostly unaffected with clustered standard errors.

7 The role of religious practices

Having established that our results are robust to the number of potential issues, we next turn to explore a potential mechanism. In particular, as highlighted in our conceptual framework in Section 3, if a more religious parent places more emphasis on a child education then this will, *ceteris paribus*, reduce the child's work activity and lead to better schooling outcomes (Proposition 1), as we observe in our results in the previous section. However, our conceptual framework also highlights the countervailing effect of religious activities: if a religious parent also places value on engaging in religious activity then this will, *ceteris paribus*, reduce their own work activity and increase their child's work activity, leading to worse schooling outcomes for the child.

Our data allows us to investigate the relevance of this mechanism which can aid in conceptualizing the effect of a parent's religiosity on a child's outcomes. To do so we conducting a heterogeneity analysis on the parent's religious practices. In particular, our three dimensions of religious practices of organized religious activities (ORA), non-organized religious activities (NORA), and intrinsic religiosity (IR), all differ in terms of how time consuming they are, with ORA being the most time consuming as it is related to religious activities outside the house, and IR the least as it is related to a deeper belief system. Guided by our conceptual framework, it can be posited that the heterogeneity in religious practices should lead to differential impact of parental religiosity on a child's outcomes when we break down the impact of religiosity into the three dimensions.

Before we carry out a full heterogeneity analysis in terms of religious practices, we start with documenting patterns observed by religiosity for a sub sample (roughly 40%) of our data where we can can cleanly categorize the parents into three types: parents who have high IR but low ORA and NORA ("IR"); parents who have high NORA but low IR and ORA ("NORA"), and parents who have high ORA but low IR and NORA ("ORA").[23]

While the patterns are based on a sub-sample and therefore only indicative, it is useful in discerning differences in the time allocation of parents based on their religious practices, which aids in contextualizing the estimated effects from the heterogeneity analysis. We first study whether,

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scenario, a cluster is a school. Next, one calculates the fraction f_n of micro observations sampled within each cluster out of all possible micro observations in the cluster. The results show that the closer $f_c * f_n$ is to zero, the more appropriate it is to use the Moulton's standard errors, whereas the closer $f_c * f_n$ is to one, the less appropriate it is to use these standard errors. Since we sample 32 of 45 schools in the rural-urban belt of Kasur and then sample all grade 5 students within a school, $f_c = 0.71$, $f_n = 1$ so $f_c * f_n = 0.71$, indicating that we should not cluster.

[23]The remaining 60% of parents have either high levels of all the types of religiosity or at least two out of three types of religiosity.

as posited by our conceptual framework, the parents with high IR have higher work hours than parents with high ORA and NORA, which are the more time consuming religious practices.

When we look at the total hours which include both the hours allocated to the economic activity and household chores, we see in Figure 1.1 that the parents who have high IR have about 12 hours of the day allocated to these activities which are significantly more hours than those allocated by parents with high NORA and ORA (roughly 10 hours). Friday holds an important place in the Islamic religious context because most individuals engage in Friday congregational prayer and attending sermons. This average difference of 2 hours of work for parents is almost doubled on Friday as shown in Figure 1.2, where the IR parents have approximately 4 more hours allocated to work. However, this is primarily because the parent with NORA and ORA reduce their work hours on Friday rather than parents with IR increasing their work hours on Friday. If the time consumed in religious activities substitutes parent's time away from work, then this may results in income heterogeneity by religious practices. We may observe higher incomes earned by parents with higher IR but lower levels of other forms of religiosity. To account for such potential differences, in all the specifications we control for household income as well as family size, and we also do not observe any statistically significant differences in income by religiosity types.

Figure 1: Parent's Engagement in Economic Activity and Household Chores
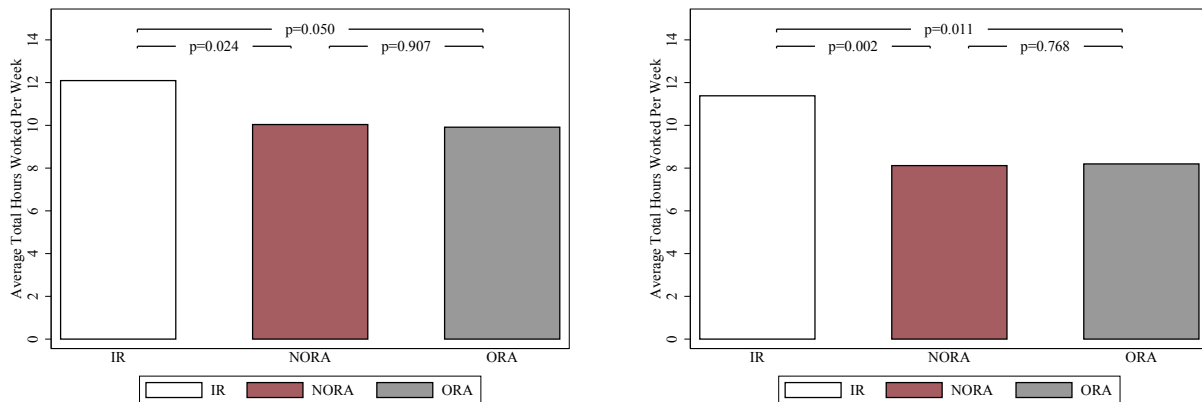

1.1: Average total work hours per day

1.2: Average total work hours on Friday

Notes: Figure 1.1 show the average of the sum of hours allocated to the economic activity and household chores (total work hours) of the parent per day by their religious categories and Figure 1.2 shows the same for Friday. The p-values are based on the regression which includes our control variables.

When we look separately at category of economic activity in Figure 2.1, we see that parents engaging in costly religious activities do indeed have lower hours of economic activity per day: parents with high IR have more than 7 hours of economic activity reported which is more than those reported for parents with high ORA and NORA. As a result, children of parents with high

ORA or NORA may have to pick up economic activity to balance the lower hours. Moreover, this difference is even more stark and significant when we look at the hours of economic activity on Friday in Figure 2.2. The Friday work hours show that while all parents regardless of religious types have lower work hours, the high IR parents do not reduce their work hours as much, while the NORA and ORA parents reduce their work hours by 2 hours on Friday.

Figure 2: Parent's Engagement in Economic Activity
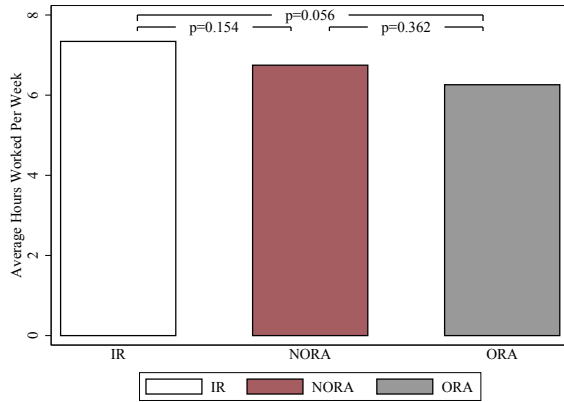
2.1: Average economic activity hours per day
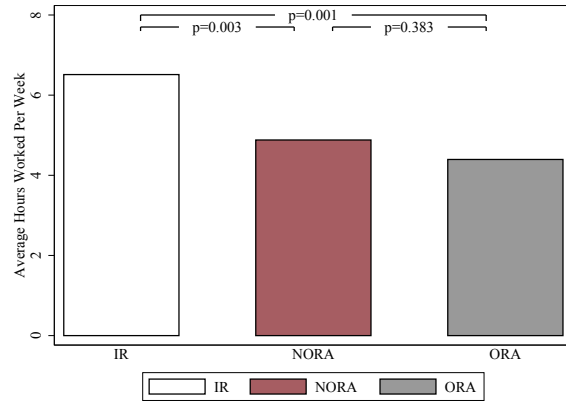
2.2: Average economic activity hours on Friday

Notes: Figure 2.1 show the average hours of economic activity of the parent per day by their religious categories and Figure 2.2 shows the same for Friday. The p-values are based on the regression which includes our control variables.

In addition to economic activity hours, parents with higher NORA and ORA may also substitute time away from household chores, requiring the children to do more chores to compensate. In Figure 3.1, we see that there is also a difference in the hours of household chores by the time costliness of the religiosity. IR parents spend more than 4.5 hours on household chores, while the other two categories lie in the range of 3 to 3.5 hours. The same patterns are observed on Friday in Figure 3.2. This makes it more likely for children of high NORA and ORA parents put in more hours on household chores.

These descriptive analyses suggest that, consistent with our conceptual framework, the time allocation of parents on work and household chores is negatively related to the parent's time consumed on religious activities, suggesting that the child may need to compensate by doing more work. We now complement this descriptive evidence by studying how our baseline results on a parent's religiosity on their child's outcomes differ by the three types of religiosity.[24] For this analysis we re-estimate the specification 3 with each type of religiosity and present the results

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[24]Despite these differences in the hours allocated to economic activity and household chores, parent's involvement with their children do not show significant difference, though the IR parents are more likely to engage with their children, but the differences are not significant.

Figure 3: Parent's Engagement in Household Chores
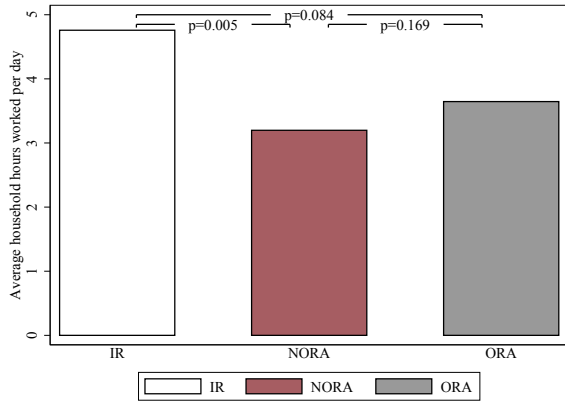
| 3.1: Average household chores hours per day | 3.2: Average household chores hours on Friday |
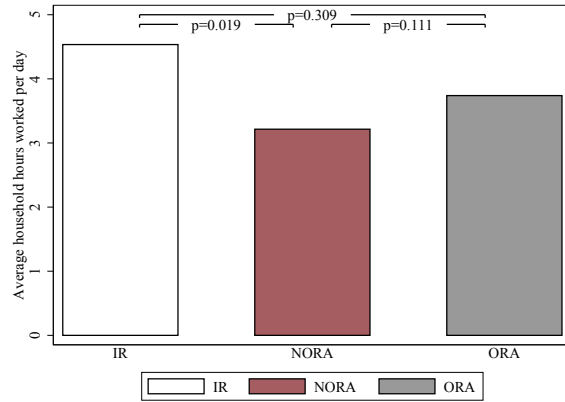
Notes: Figure 3.1-3.2 show the average hours of household chores per day and Friday, respectively for parents by their religiosity practices. The p-values are based on the regression which includes our control variables.

in Table 8. Panel A presents the results for IR, panel B for NORA and panel C for ORA. For the IR, we also present the results in the appendix (see Table A4) where each item of IR is analyzed separately.

The results show that in stark contrast to ORA and somewhat NORA, IR shows a strong positive effect on school performance and negative effect for all work related outcomes, exactly in line with the findings from the overall religiosity measure. In particular, the ORA religiosity of parents does not explain the positive relation for schooling outcome and negative relation for child work activity outcomes, however NORA seems to suggest a significant positive relation with pass, a negative relation with absence and a negative relation for economic activity, though the effects are economically smaller (almost 50% smaller) than the effects of IR. The other child work activity outcomes are not explained by NORA. This is inline with parents with NORA work more than parents with ORA, thus the child's engagement in work activity is less likely for these parents compared to parents with ORA.

In line with our conceptual framework, these differences across the estimated effects of religiosity types can be reconciled with the time-consumption by religious activities and how it impacts parents allocation of time across work and household chores.

Table 8: Impact of Religiosity

	Pass (Y/N)	Absence	All Work (Y/N)	Economic Activity (Y/N)	Household Chores (Y/N)	Work Hours
	(1)	(2)	(3)	(4)	(5)	(6)
Intrinsic (IR)	0.48**	-0.14*	-0.74***	-0.47***	-0.75***	-0.53***
	(0.21)	(0.082)	(0.12)	(0.13)	(0.12)	(0.10)
	⟨0.081⟩		⟨-0.20⟩	⟨-0.10⟩	⟨-0.20⟩	
N	559	1246	1319	1165	1316	1180

	Pass (Y/N)	Absence	All Work (Y/N)	Economic Activity (Y/N)	Household Chores (Y/N)	Work Hours
	(1)	(2)	(3)	(4)	(5)	(6)
Non-organized Religious Activities (NORA)	0.19**	-0.069**	-0.059	-0.14**	-0.059	-0.011
	(0.086)	(0.035)	(0.050)	(0.056)	(0.050)	(0.044)
	⟨0.031⟩		⟨-0.016⟩	⟨-0.031⟩	⟨-0.016⟩	
N	559	1246	1319	1165	1316	1180

	Pass (Y/N)	Absence	All Work (Y/N)	Economic Activity (Y/N)	Household Chores (Y/N)	Work Hours
	(1)	(2)	(3)	(4)	(5)	(6)
Organized Religious Activities (ORA)	0.044	-0.035	-0.036	0.021	-0.044	-0.032
	(0.087)	(0.032)	(0.044)	(0.052)	(0.044)	(0.041)
	⟨0.0074⟩		⟨-0.0099⟩	⟨0.0046⟩	⟨-0.012⟩	
N	559	1246	1319	1165	1316	1180

8 Conclusion

In developing countries, parents of young children face a complex household time allocation problem. As in any country, they make decisions about their own labor supply and influence the schooling decisions of their children. However, unlike in most developed countries they also often simultaneously decide about how much work their child should engage in, knowing that time spent by the child working may reduce time the child can spend on his or her education.

In this paper, we studied how a parent's religiosity impacts how they solve this complex household time allocation problem and, as a result, how parental religiosity impacts a child's human capital development in a developing country context. We developed a simple conceptual framework to understand how parental religiosity may impact a child's schooling outcomes and work activity. The framework involves two countervailing forces that make it unclear how parental religiosity will impact a child's human capital development. On one hand, parents that

are more religious may put more weigh on a child's education in accordance with the religious teaching of many religions. This emphasis on education means parents are less inclined to have their children work such that children can spend more time on school and improve their schooling outcomes. On the other hand, a religious parent may find it important to engage in religious activities as is also the norm in many religions, and this time spent on religious activity reduces their own time available for work. Parents may therefore require more work from their children to compensate and this increased work activity by the child reduces his or her time schooling outcomes.

We find two main results. First, we find that a parent's religiosity has a positive impact on a child's human capital development, improving school outcomes and reducing work activity. Second, we find evidence that our conceptual framework seems appropriate to organize these results, as the parent's religiosity has a positive impact on a child's human capital development only if the parent's religious practices are less time consuming. As a result, we find that a parent's religiosity will have a positive impact on a child's human capital development only if the parent's religious practices do not not overemphasize time consuming religious activities.

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Appendix A

Table A1: Impact of Religiosity

	Pass (Y/N)	Absence	All Work (Y/N)	Economic Activity (Y/N)	Household Chores (Y/N)	Work Hours
	(1)	(2)	(3)	(4)	(5)	(6)
Edu(Father)	0.42**	-0.062	-0.12	-0.0089	-0.10	-0.061
	(0.19)	(0.066)	(0.092)	(0.11)	(0.092)	(0.083)
	⟨0.066⟩		⟨-0.033⟩	⟨-0.0020⟩	⟨-0.028⟩	
Edu(Mother)	0.50*	0.11	0.036	0.16	0.026	-0.027
	(0.27)	(0.087)	(0.12)	(0.14)	(0.12)	(0.11)
	⟨0.072⟩		⟨0.0097⟩	⟨0.036⟩	⟨0.0070⟩	
Raven(parent)	-0.0099	-0.0061*	-0.021***	-0.051***	-0.021***	-0.0098**
	(0.0091)	(0.0035)	(0.0050)	(0.0062)	(0.0050)	(0.0044)
	⟨-0.0017⟩		⟨-0.0057⟩	⟨-0.011⟩	⟨-0.0057⟩	
Age(Father)	0.00037	0.000016	-0.013	-0.014	-0.012	0.00034
	(0.021)	(0.0091)	(0.013)	(0.015)	(0.013)	(0.011)
	⟨0.000062⟩		⟨-0.0034⟩	⟨-0.0032⟩	⟨-0.0031⟩	
Age(Mother)	-0.0056	0.0069	0.032**	-0.0026	0.032**	0.015
	(0.022)	(0.0094)	(0.014)	(0.015)	(0.014)	(0.012)
	⟨-0.00093⟩		⟨0.0085⟩	⟨-0.00057⟩	⟨0.0086⟩	
Age(child)	0.055	0.062*	0.11**	-0.098*	0.11**	0.088**
	(0.094)	(0.035)	(0.050)	(0.057)	(0.050)	(0.044)
	⟨0.0092⟩		⟨0.030⟩	⟨-0.022⟩	⟨0.031⟩	
Raven(child)	0.031**	-0.00052	-0.017**	-0.0084	-0.019**	-0.012
	(0.016)	(0.0059)	(0.0080)	(0.0092)	(0.0080)	(0.0075)
	⟨0.0052⟩		⟨-0.0047⟩	⟨-0.0019⟩	⟨-0.0052⟩	
Family-size	-0.049	0.028	0.012	0.018	0.0076	-0.0034
	(0.065)	(0.023)	(0.031)	(0.038)	(0.031)	(0.029)
	⟨-0.0083⟩		⟨0.0033⟩	⟨0.0039⟩	⟨0.0021⟩	
HH Income	-0.35	0.023	0.035	0.0035	0.033	0.050
	(0.25)	(0.038)	(0.056)	(0.074)	(0.056)	(0.049)
	⟨-0.059⟩		⟨0.0094⟩	⟨0.00076⟩	⟨0.0090⟩	
HH Income Missing	-3.35	0.10	0.53	0.030	0.48	0.56
	(2.46)	(0.37)	(0.54)	(0.72)	(0.55)	(0.48)
	⟨-0.68⟩		⟨0.13⟩	⟨0.0068⟩	⟨0.12⟩	
Religiosity	2.10**	-0.78**	-2.09***	-1.56***	-2.16***	-1.46***
	(0.89)	(0.36)	(0.52)	(0.56)	(0.52)	(0.45)
	⟨0.35⟩		⟨-0.56⟩	⟨-0.34⟩	⟨-0.59⟩	
N	559	1246	1319	1165	1316	1180

Table A2: Female: Impact of Religiosity

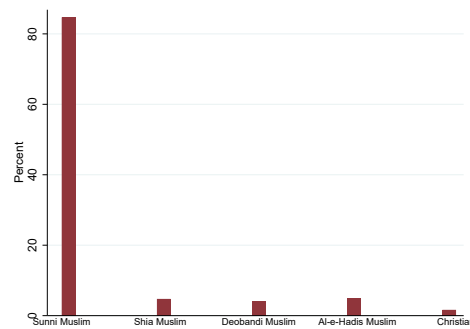|	Pass (Y/N)	Absence	All Work (Y/N)	Economic Activity (Y/N)	Household Chores (Y/N)	Work Hours
	(1)	(2)	(3)	(4)	(5)	(6)
Edu(Father)	0.84	-0.13	-0.29**	-0.18	-0.28**	-0.26**
	(0.56)	(0.083)	(0.14)	(0.18)	(0.14)	(0.12)
	⟨0.086⟩		⟨-0.080⟩	⟨-0.034⟩	⟨-0.077⟩	
Edu(Mother)	-0.062	0.072	-0.043	0.34	-0.039	0.044
	(0.53)	(0.11)	(0.19)	(0.23)	(0.19)	(0.16)
	⟨-0.0088⟩		⟨-0.012⟩	⟨0.073⟩	⟨-0.011⟩	
Raven(parent)	0.020	-0.0033	-0.015**	-0.079***	-0.014*	-0.0018
	(0.020)	(0.0044)	(0.0074)	(0.011)	(0.0074)	(0.0064)
	⟨0.0028⟩		⟨-0.0039⟩	⟨-0.016⟩	⟨-0.0037⟩	
Age(Father)	0.0045	-0.013	-0.052**	-0.079***	-0.054**	-0.024
	(0.067)	(0.013)	(0.022)	(0.028)	(0.022)	(0.018)
	⟨0.00063⟩		⟨-0.014⟩	⟨-0.015⟩	⟨-0.014⟩	
Age(Mother)	0.0068	0.020	0.080***	0.071**	0.083***	0.044**
	(0.068)	(0.013)	(0.023)	(0.029)	(0.023)	(0.019)
	⟨0.00095⟩		⟨0.021⟩	⟨0.014⟩	⟨0.022⟩	
Age(child)	0.18	0.066	0.12*	-0.13	0.12	0.080
	(0.22)	(0.043)	(0.075)	(0.093)	(0.075)	(0.063)
	⟨0.024⟩		⟨0.033⟩	⟨-0.026⟩	⟨0.032⟩	
Raven(child)	-0.0060	-0.013*	-0.018	-0.036**	-0.018	-0.0070
	(0.033)	(0.0072)	(0.012)	(0.015)	(0.012)	(0.010)
	⟨-0.00083⟩		⟨-0.0048⟩	⟨-0.0070⟩	⟨-0.0049⟩	
Family-size	-0.20	0.019	0.019	0.021	0.019	0.0081
	(0.14)	(0.027)	(0.045)	(0.060)	(0.045)	(0.039)
	⟨-0.028⟩		⟨0.0050⟩	⟨0.0042⟩	⟨0.0051⟩	
HH Income	0.12	-0.0040	0.037	0.028	0.035	0.060
	(0.45)	(0.035)	(0.064)	(0.089)	(0.065)	(0.053)
	⟨0.017⟩		⟨0.0099⟩	⟨0.0055⟩	⟨0.0092⟩	
HH Income Missing	0.94	-0.19	0.68	0.40	0.67	0.62
	(4.31)	(0.35)	(0.64)	(0.87)	(0.64)	(0.52)
	⟨0.087⟩		⟨0.16⟩	⟨0.084⟩	⟨0.16⟩	
Religiosity	6.88**	-0.28	-2.56***	1.17	-2.56***	-1.08
	(3.03)	(0.49)	(0.88)	(1.13)	(0.88)	(0.74)
	⟨0.96⟩		⟨-0.68⟩	⟨0.23⟩	⟨-0.68⟩	
N	157	559	606	529	606	522

Table A3: Male: Impact of Religiosity

	Pass (Y/N)	Absence	All Work (Y/N)	Economic Activity (Y/N)	Household Chores (Y/N)	Work Hours
	(1)	(2)	(3)	(4)	(5)	(6)
Edu(Father)	0.31	-0.028	0.042	0.12	0.070	0.091
	(0.21)	(0.100)	(0.13)	(0.15)	(0.13)	(0.11)
	⟨0.051⟩		⟨0.011⟩	⟨0.026⟩	⟨0.019⟩	
Edu(Mother)	0.77**	0.12	0.052	0.040	0.031	-0.10
	(0.34)	(0.13)	(0.16)	(0.19)	(0.16)	(0.15)
	⟨0.11⟩		⟨0.014⟩	⟨0.0088⟩	⟨0.0084⟩	
Raven(parent)	-0.020*	-0.0087*	-0.026***	-0.028***	-0.026***	-0.015**
	(0.012)	(0.0053)	(0.0068)	(0.0080)	(0.0068)	(0.0060)
	⟨-0.0034⟩		⟨-0.0069⟩	⟨-0.0062⟩	⟨-0.0070⟩	
Age(Father)	-0.0071	0.0065	0.012	0.019	0.015	0.014
	(0.023)	(0.013)	(0.017)	(0.018)	(0.017)	(0.015)
	⟨-0.0012⟩		⟨0.0032⟩	⟨0.0043⟩	⟨0.0040⟩	
Age(Mother)	0.00037	0.000080	0.0038	-0.043**	0.0025	0.00011
	(0.024)	(0.013)	(0.017)	(0.020)	(0.017)	(0.015)
	⟨0.000061⟩		⟨0.0010⟩	⟨-0.0095⟩	⟨0.00066⟩	
Age(child)	0.022	0.059	0.077	-0.12	0.086	0.076
	(0.11)	(0.053)	(0.068)	(0.077)	(0.068)	(0.061)
	⟨0.0037⟩		⟨0.021⟩	⟨-0.026⟩	⟨0.023⟩	
Raven(child)	0.054***	0.0091	-0.018	0.0055	-0.020*	-0.016
	(0.019)	(0.0091)	(0.011)	(0.013)	(0.011)	(0.011)
	⟨0.0091⟩		⟨-0.0047⟩	⟨0.0012⟩	⟨-0.0055⟩	
Family-size	0.023	0.029	0.0037	-0.020	-0.0056	-0.011
	(0.079)	(0.036)	(0.044)	(0.052)	(0.044)	(0.042)
	⟨0.0038⟩		⟨0.00099⟩	⟨-0.0045⟩	⟨-0.0015⟩	
HH Income	-0.65**	0.13	0.031	-0.018	0.033	0.045
	(0.33)	(0.094)	(0.11)	(0.19)	(0.11)	(0.11)
	⟨-0.11⟩		⟨0.0084⟩	⟨-0.0039⟩	⟨0.0090⟩	
HH Income Missing	-6.20*	1.16	0.38	-0.19	0.35	0.53
	(3.21)	(0.91)	(1.09)	(1.79)	(1.08)	(1.04)
	⟨-0.68⟩		⟨0.095⟩	⟨-0.040⟩	⟨0.089⟩	
Religiosity	1.73*	-1.05**	-1.73***	-2.65***	-1.84***	-1.53***
	(1.00)	(0.51)	(0.66)	(0.66)	(0.66)	(0.58)
	⟨0.29⟩		⟨-0.46⟩	⟨-0.58⟩	⟨-0.50⟩	
N	402	687	713	636	710	658

Table A4: Impact of Intrinsic Religiosity

	Pass (Y/N)	Absence	All Work (Y/N)	Economic Activity (Y/N)	Household Chores (Y/N)	Work Hours
	(1)	(2)	(3)	(4)	(5)	(6)
Experience Allah's Presence	0.24	-0.083	-0.30***	-0.26**	-0.32***	-0.18**
	(0.17)	(0.070)	(0.10)	(0.11)	(0.10)	(0.086)
	⟨0.040⟩		⟨-0.082⟩	⟨-0.056⟩	⟨-0.086⟩	
N	559	1246	1319	1165	1316	1180

	Pass (Y/N)	Absence	All Work (Y/N)	Economic Activity (Y/N)	Household Chores (Y/N)	Work Hours
	(1)	(2)	(3)	(4)	(5)	(6)
Religious approach to life	0.38**	-0.048	-0.53***	-0.30***	-0.55***	-0.39***
	(0.16)	(0.062)	(0.092)	(0.096)	(0.092)	(0.075)
	⟨0.064⟩		⟨-0.14⟩	⟨-0.066⟩	⟨-0.15⟩	
N	559	1246	1319	1165	1316	1180

	Pass (Y/N)	Absence	All Work (Y/N)	Economic Activity (Y/N)	Household Chores (Y/N)	Work Hours
	(1)	(2)	(3)	(4)	(5)	(6)
Bring religion to real life dealings	0.20	-0.092*	-0.36***	-0.24***	-0.35***	-0.27***
	(0.13)	(0.054)	(0.077)	(0.081)	(0.077)	(0.065)
	⟨0.033⟩		⟨-0.096⟩	⟨-0.052⟩	⟨-0.095⟩	
N	559	1246	1319	1165	1316	1180

Figure A1: Religious Sects

Appendix: Conceptual Framework

Proof of Proposition 1

Proof. Maximizing:

$$U(c, r, g) = [\alpha_1(l_p + l_c)^\rho + \alpha_2(1 - l_p)^\rho + \alpha_3(1 - l_c)^\rho]^{\frac{1}{\rho}}$$

with respect to l_p:

$$l_p = \frac{\left(\frac{\alpha_2}{\alpha_1}\right)^{\frac{1}{\rho-1}} - l_c}{1 + \left(\frac{\alpha_2}{\alpha_1}\right)^{\frac{1}{\rho-1}}}; \tag{A1}$$

and with respect to l_c:

$$l_c = \frac{\left(\frac{\alpha_3}{\alpha_1}\right)^{\frac{1}{\rho-1}} - l_p}{1 + \left(\frac{\alpha_3}{\alpha_1}\right)^{\frac{1}{\rho-1}}}. \tag{A2}$$

Solving (A1) and (A2) for l_p:

$$l_p = \frac{\alpha_2^{\frac{1}{\rho-1}} - \alpha_3^{\frac{1}{\rho-1}} + \left(\frac{\alpha_2\alpha_3}{\alpha_1}\right)^{\frac{1}{\rho-1}}}{\alpha_2^{\frac{1}{\rho-1}} + \alpha_3^{\frac{1}{\rho-1}} + \left(\frac{\alpha_2\alpha_3}{\alpha_1}\right)^{\frac{1}{\rho-1}}}$$

and for l_c:

$$l_c = \frac{\alpha_3^{\frac{1}{\rho-1}} - \alpha_2^{\frac{1}{\rho-1}} + \left(\frac{\alpha_2\alpha_3}{\alpha_1}\right)^{\frac{1}{\rho-1}}}{\alpha_2^{\frac{1}{\rho-1}} + \alpha_3^{\frac{1}{\rho-1}} + \left(\frac{\alpha_2\alpha_3}{\alpha_1}\right)^{\frac{1}{\rho-1}}}$$

Therefore: $\frac{\partial l_p}{\partial \alpha_2} < 0$, $\frac{\partial l_p}{\partial \alpha_3} > 0$, $\frac{\partial l_c}{\partial \alpha_2} > 0$, and $\frac{\partial l_p}{\partial \alpha_3} < 0$, because $p < 1$. Finally, the school performance g is a negative function of l_c. ∎

Appendix B: Online

Summary Statistics

Table B1 include the distribution of schools by levels and gender.

Table B1: School Sample

Gender	Total Schools level			Our Sample level		
	High	Middle	Total	High	Middle	Total
Female	11	10	21	11	4	15
Male	8	16	24	5	12	17
Total	19	26	45	16	16	32

Note: This table provides the distribution of schools by school levels and gender.

Behavioral Games: Instructions

In this section, we present the behavioral games we use in the field to elicit parent's altruism, time discounting and risk aversion. For both the time preference and risk aversion experiments, at the end of the entire survey, one scenario is selected at random, and the participant is paid based on their decision made for that scenario. The income from the modified dictator game is paid or the gifts are given to the child at the same time.

Altruism

Please choose one of the two options below:

Table B2: Altruism

o Child Consumption Good (PKR 50) o Mobile Credit (PKR 35)

You will be asked to play two different types of games in this section [Game 1 (Risk Aversion) and 2 (Time Discounting)]. Two games are independent and give a payoff. With each game, we will explain the payoff structure that will be applied to determine your payoff, but you will know only at the end of the visit what payoff you received from Game 1 and Game 2. No game will give you negative payoff.

To determine what payments you receive from Game 1 and Game 2, we will ask you at the end of the survey to take a slip out of a hat containing slips numbered from 1 to 10. The number on the slip will represent the decision and the corresponding payment method you will receive. You should try to answer the questions as best as you can. There are no right or wrong answers. Do you understand the instructions? Please ask questions if you do not understand anything.

Time Discounting

Pick one option (A or B) for each of the 10 decisions below. Each decision asks you to pick (A) some amount of PKR today vs. (B) another amount 2 weeks from now. You can give only one answer per decision.

For the payment, you will be asked to draw a slip from a hat containing slips numbered from 1 to 10. The number on the slip will determine which decision [from 1 to 10] will be used for your payment, and your answer for that decision will determine your payoff. For example, if you draw slip number 7, Decision 7 is selected for payment. Decision 7 is as follows:

Decision (7): (A) PKR 65 guaranteed today - (B) PKR 100 guaranteed in 2 weeks

If for that decision you chose (B), then you will get payment for PKR 100 as a mobile credit, which you will receive two weeks from now. However, if you chose option (A) for Decision 7, then the mobile credit will be transferred by the end of today. Do you understand the game and the payment method?

Please ask questions if you do not understand anything.

Table B3: Time Discounting

Decision	Option A	TODAY	Option B	2 WEEKS
1	o	(A) PKR 95 guaranteed today	o	(B) PKR 100 guaranteed in 2 weeks
2	o	(A) PKR 90 guaranteed today	o	(B) PKR 100 guaranteed in 2 weeks
3	o	(A) PKR 85 guaranteed today	o	(B) PKR 100 guaranteed in 2 weeks
4	o	(A) PKR 80 guaranteed today	o	(B) PKR 100 guaranteed in 2 weeks
5	o	(A) PKR 75 guaranteed today	o	(B) PKR 100 guaranteed in 2 weeks
6	o	(A) PKR 70 guaranteed today	o	(B) PKR 100 guaranteed in 2 weeks
7	o	(A) PKR 65 guaranteed today	o	(B) PKR 100 guaranteed in 2 weeks
8	o	(A) PKR 60 guaranteed today	o	(B) PKR 100 guaranteed in 2 weeks
9	o	(A) PKR 55 guaranteed today	o	(B) PKR 100 guaranteed in 2 weeks
10	o	(A) PKR 50 guaranteed today	o	(B) PKR 100 guaranteed in 2 weeks

Risk Aversion

Tomorrow there are two cricket matches in two different venues. One cricket match has team A batting while the other match has team B batting. You are asked to make a decision to attend one of the two matches (match with team A or match with team B). Both matches have a free cost of entry and you will receive 1 PKR per 10 runs made by the team for the match you decide to attend. You cannot attend both matches as they are in different locations. You know that team A and team B have different performance in terms of batting if they play with a tape ball versus a hard ball. Team A gets 200 runs with a tape ball but only 160 runs with a hard ball. Team B, on the other hand, gets 385 runs with the tape ball but 10 runs with the hard ball. Both of tomorrow's matches use the same type of ball, but the chance that each ball (tape or hard) is used is not known. Below you will make 10 choices to watch either team A or team B under different

chances of the type of ball used. If you select to watch team A, then you get 20 PKR if a tape ball is used and 16 PKR if a hard ball is used. On the other hand, if you select to watch team B and a tape ball is used, then you get 38.5 PKR, while if a hard ball is used, then you get only 1 PKR. Therefore, for your return, team B performs very well with a tape ball but extremely bad with a hard ball, while team A performs consistently with the two types of balls but marginally better with the tape ball. See the payoff table to understand the game:

Table B4

If	Tape	Hard
Watch Team A	20 PKR	16 PKR
Watch Team B	38.5 PKR	1 PKR

Please select (A) or (B) for each of the 10 decisions below. For payment, you will be asked at the end of the survey to select a slip from a hat containing numbers from 1 to 10. The slip you chose will determine which decision will be used for your payment. For example, if you pick a slip with number 7, then Decision 7 will be selected. Decision 7 is as follows: Decision 7 70% chance of using a tape ball, 30% chance of using a hard ball

Then, the final payment will be determined based on the probability attached to Decision 7 for a tape ball (70%) and hard ball (30%) and your chosen option (A) or (B). Imagine that there are 100 balls in a basket and you cannot see the type of balls. Decision 7 states that of the 100 balls, there are 70 TAPE balls and 30 HARD balls. If you chose to watch TEAM (A) and then you pick out a ball without looking and it is a TAPE ball (which has a higher chance of happening) then you will get 20 PKR, but if you chose to watch TEAM (B) then you will get 38.5 PKR. What will you get when a HARD ball is selected and you chose to watch Team A?

Do you understand the payment method? Please ask questions if you do not understand anything about the game. Again, the payment will be made through mobile credit today.

Table B5: Risk Aversion

Decision	Watch A	Tape Ball Chances	Watch B	Hard Ball Chances
1	o	10% chance of using a tape ball	o	90% chance of using a hard ball
2	o	20% chance of using a tape ball	o	80% chance of using a hard ball
3	o	30% chance of using a tape ball	o	70% chance of using a hard ball
4	o	40% chance of using a tape ball	o	60% chance of using a hard ball
5	o	50% chance of using a tape ball	o	50% chance of using a hard ball
6	o	60% chance of using a tape ball	o	40% chance of using a hard ball
7	o	70% chance of using a tape ball	o	30% chance of using a hard ball
8	o	80% chance of using a tape ball	o	20% chance of using a hard ball
9	o	90% chance of using a tape ball	o	10% chance of using a hard ball
10	o	100% chance of using a tape ball	o	0% chance of using a hard ball

Institutional background

A few distinct features define the public school system in Pakistan. Despite the international perception of the prevalence of religious schools in Pakistan – "madrassahs" (religious schools) – public schools define the landscape of Pakistan's education system.[25] All children in the transitioning phase from class 5 (primary school) to 6 (middle school) in these schools are required to take a centrally set exam. In public schools, the academic year runs from April to March, while in private schools, it runs from September to June. Therefore, the central exam occurs in March. Moreover, the majority of these schools are segregated by gender, and most children in these schools pursue primary and middle education at the same public school. All these features guide our access to parent-child pairs by sampling schools, as described in the paper.

Protocol

Since this study involves human subjects (parents and children), the project was reviewed and approved by an institutional review board (IRB). Moreover, we paid special attention to various concerns that could impact the quality of the survey data. First, we hired and trained 25 enumerators from January to March 2018. The enumerators were provided with digitized surveys on iPads. The digitization of the surveys allowed us to add additional checks to minimize mistakes or incoherent answers. Where possible, we added conditional statements and restricted the survey from proceeding to the next question if, for example, an answer was missing or numerals were added by mistake. In addition, digitization enabled direct codification of the data, which further helped us to prevent potential human errors (especially those associated with paper-based surveys).

The enumerators were trained to ensure that they could navigate the digital survey and were encouraged to ask questions if there was any confusion during training. Issues pertaining to enumerators self-filling surveys was minimized by employing enumerators who have conducted surveys in the past and highlighting the fact that their future employment for other projects could be hampered. We also required each enumerator to record (using voice recorders) their interactions with subjects, and in each locality, an assigned manager conducted random spot checks.

To minimize potential issues that could arise because of subjects speaking about the survey with any other potential subject (in our sample), we covered all the households in a neighborhood (within walking distance) within one day. Given that the responder could be a woman, we recruited both men and women as enumerators so that the responder would be at ease and to

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[25]In particular, Andrabi et al. (2005) show that enrollment in these schools is less than 1 percent in the entire country, and no supporting evidence exists for a dramatic increase in the religious school system in recent years.

substantially reduce non-response.

Finally, the most important protocol in conducting surveys with children is compliance with the additional requirements of the IRB. We fully complied with those protocols by acquiring a parent's consent to survey the child. Parents were also asked to be present during the Raven's test and when the child was asked additional questions. However, we provided special instructions to the enumerator and parents to minimize interference by the parent during the child survey. We also recorded these interactions.

The survey for parents took no more than an hour (30 minutes for the 60-question Raven's test and the rest for the remaining survey), and the child survey took no more than 40 minutes (30 minutes for the 45-question colored Raven's test and 10 minutes for the remaining questions). Parents were paid on average $4.5 worth of mobile credit, while children were compensated with stickers and pencils worth $1. The payment came in the form of a phone credit designed to be transferred directly to the parents' phone numbers. In Pakistan, phone credit is a valuable gift since the credit can be transferred to other people at no cost. Moreover, almost every person in Pakistan owns and regularly uses the phone service.[26] The payment for parents was similar to the hourly wage ($0.8 per hour) of a laborer in Pakistan.[27] For children, the wage calculation is challenging because many children are employed either in unpaid jobs or within their households, making it difficult to quantify their value addition or value from their engagement in economic activity. However, we tried to select gifts that were age appropriate and appealing to children.

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[26]From a survey perspective, this feature also provides the advantage of avoiding potential issues of theft due to enumerators carrying large sums of cash on the road.

[27]Based on the GDP per capita estimate for Pakistan in 2018, the average pay in Pakistan was roughly $1641 per year, which translates to $\approx$ $6 per day.