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**Going to School in *Purdah*: Female Schooling,
Mobility Norms and Madrasas in Bangladesh**

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ABSTRACT

Going to School in *Purdah*: Female Schooling, Mobility Norms and Madrasas in Bangladesh

This paper looks at the determinants of secondary school attendance in Bangladesh with a focus on the interaction between community gender norms and relative supply of madrasas (i.e. Islamic schools). We present a theoretical framework where the probability of children's school participation varies with respect to a non-economic factor – how the community observes social norms regarding female mobility – conditional upon the types of available schools. Household data from the Bangladesh Demographic Health Survey (BDHS) is combined with community information on the availability of non-religious secondary schools and madrasas to test our theoretical predictions. We find that in communities which are more 'progressive', in the sense that women have a relatively high level of mobility, the effect of non-religious school availability on attendance does not vary by gender. However in the more 'conservative communities', female schooling is more sensitive to the availability of, or distance to, madrasas.

JEL Classification: D04, I21, O15

Keywords: *burka*, school availability, gender norms, female education, madrasa, Bangladesh

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1. Introduction

Low level of female schooling is a common problem in many developing countries where school enrolment statistics show large gaps in favour of boys. Bangladesh is one of the very few developing countries that have managed to reverse the conventional gender gap. In secondary education, girls today outnumber boys (Khandker *et al.* 2003, Arends-Kuenning and Amin 2004, Asadullah and Chaudhury 2009a). This is a unique achievement because girls elsewhere in Muslim communities in South Asia generally lag behind boys in schooling. Nonetheless, research into the determinants of female secondary schooling in Bangladesh has been limited. Although causal evidence is lacking, the recent growth in female schooling is popularly associated with the Female Secondary School Assistance Programme (FSSAP), a cash transfer scheme introduced in 1994. Under the programme, stipends were given to girls irrespective of household wealth conditional upon enrolment in secondary school (and fulfilling other conditions while is school, such as maintaining regular attendance).

The intervention also removed supply-constraints to female education. New religious as well as non-religious registered secondary schools were constructed and additional female teachers were recruited in schools. Including religious schools in the stipend programme not only set out the basis for a dramatic increase in female schooling in Bangladesh, but also induced the country's previously all-male registered madrasa sector to open their gates to girls. A less known fact about the rise of female schooling in Bangladesh is the increase in female schooling in registered madrasas. Therefore, understanding the role played by madrasas in facilitating girls' secondary education in the country is also important from a policy point of view.

Madrasas differ from non-religious schools in many ways. Not only do they follow a more Islamic curriculum and provide a cheaper alternative to non-religious schools, their students are also subject to an elaborate 'Islamic' dress code: most of the country's aided and recognized secondary madrasas officially imposes a specific set of gender norms in dressing (World Bank 2010). In most cases, female pupils in madrasas have to observe *purdah* (the Muslim custom of veiling) in some form. These non-academic aspects of madrasas may be particularly valued by households in certain communities. For instance, communities where the physical mobility of adult females is socially constrained may demand secondary schooling for school-age daughters only when there is easy access to a secondary-level madrasa. We formalize this idea using an analytical framework. To the best of our knowledge, this is the first paper on the relationship between community social norms and female schooling in a developing country¹. We are also unaware of any paper that investigates female secondary school participation in relation to the availability of madrasas in the community. Therefore, the paper fills two important gaps in the literature on female schooling in Muslim communities.

¹ For an extensive review of the developing country literature, see Glick (2008).

We use the Bangladesh Demographic and Health Survey 2007 to test the effect of community social norms on school participation. Social norms relating to female mobility is measured as the proportion of married women in a sub-district who report being “able to visit friends or family without seeking permission from another member of the household.” A number of findings emerge from our regression analysis. *Firstly*, the probability of secondary school attendance is positively affected by the availability of non-religious schools and madrasas in the sub-district. *Secondly*, secondary school attendance is significantly affected by our measure of social norms relating to female mobility: the lower the extent of female mobility in the community, the lower is the probability of school attendance. However, this relationship holds true only for girls. *Thirdly*, in sub-districts which are more 'progressive' in the sense that women have a relatively high level of mobility, the effect of availability of non-religious school on attendance is the same for boys and girls. But in the sub-districts that are more 'conservative' in terms of female mobility, the availability of madrasas raises the probability of secondary school attendance for girls six times as much as in the more 'progressive' sub-districts. This implies that madrasas relax some constraints on female schooling to a far greater extent in the 'conservative' sub-districts than in the 'progressive' sub-districts. By contrast, the availability of non-religious schools has no effect on female school attendance in the 'conservative' sub-districts. In other words, parents are unwilling to send their daughters to non-religious school in these sub-districts even where they are more accessible.

The rest of the paper is organized as follows. We explain the background of the study in the next section. In section 3, we provide a brief discussion on norms regarding female mobility in Bangladesh. Here we also describe an analytical framework that explains the link between school participation and community norms by gender. We describe the data and methodology in section 4. In section 5, we present regression results on the determinants of secondary school attendance by sex. We use the data to provide further insights behind the causes of conservative mobility norms in section 6. We conclude in section 7 by discussing the implications of our findings.

2. Background on Female Education and Madrasas in Bangladesh

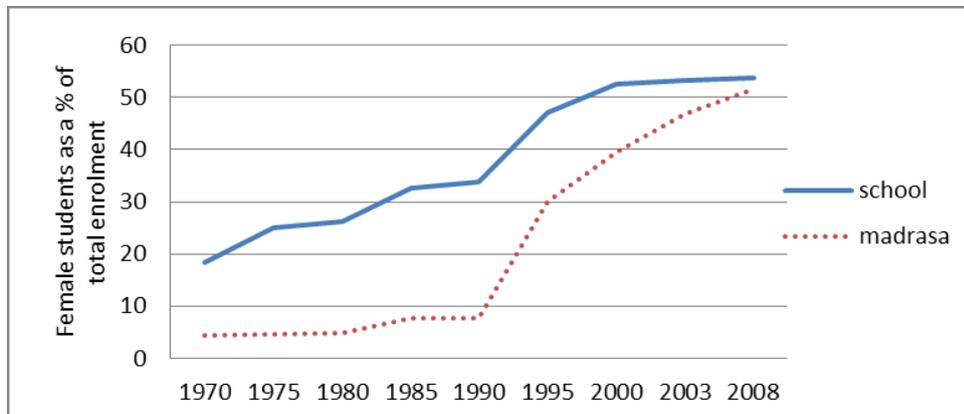
Due to a historical underinvestment in female education, a significant gender bias was evident in educational outcomes in Bangladesh till the 1980s. In the early 1990s, secondary school enrolment and completion was low for girls compared to boys. This was true across rural and urban areas. The gender gap was particularly large in the registered secondary madrasas where girls accounted for only 7.7% of total enrolment (Asadullah and Chaudhury, 2009b). Between 1990 and 2000, however, Bangladesh witnessed a rapid improvement in the female-to-male secondary school enrollment ratio. An exponential jump in secondary schooling took place immediately following the introduction of the FSSAP scheme in the early 1990s. The female-to-male ratio in secondary school enrollment increased from 62% in 1992 to 114% in 2005

(meaning that the share of girls in secondary schooling was close to 55% compared to under 40% in early 1990s) (Asadullah & Chaudhury 2009a).

The FSSAP scheme spanned all rural and non-metropolitan secondary schools (both non-religious and religious) that are recognized by the government. Female graduates of primary schools who enrol in grade 6 in a high school are automatically eligible for the stipend. Any eligible female student is awarded a stipend if she meets the following conditions: i) she must attend at least 85% of the classes in an academic year; ii) she must obtain, on average, 45% marks at the half yearly/annual examination; iii) she must remain unmarried till she passes the SSC (secondary school certificate) examination. Students fulfilling all the three criteria receive stipends up to grade 10. Stipends cover full tuition and other related costs (e.g. examination, school fees, textbooks, school supplies, uniforms, etc.), and the total stipend amount increases with the grade level. The scheme also provided additional funding to all registered secondary schools and madrasas depending on the number of enrolled female students. This combination of demand-side and supply-side incentives led to a significant rise in female enrolment nationwide.

The registered madrasa sector responded to the incentives provided by the stipend programme in two ways. On one hand, new co-educational madrasas were set up. On the other hand, existing secondary madrasas came forward and registered themselves as co-educational institutions. This led to a dramatic increase in the enrolment share of registered madrasas, which have traditionally been all-male, and which therefore had the greatest capacity to absorb female students in response to the financial incentives (Asadullah and Chaudhury 2009b). The share of female students in madrasas rose dramatically from 7.7% in 1990 to 52% in 2008. The share of female students in registered secondary schools in the country also rose from 34% to 54% during the same period (Fig. 1). Consequently, registered secondary madrasas and non-religious schools today enrol more than one girl for every boy student.

Figure 1. Trends in the share of female students in post-primary schools and madrasas in Bangladesh, 1970-2008



Source: Asadullah & Chaudhury, 2009b.

The inclusion of girls within the secondary madrasa schooling system in Bangladesh has the potential to bring about a major social transformation with direct implications for several of the Millennium Development Goals: child health, maternal health and gender equality. A recent study by Asadullah and Chaudhury (2010) in the context of Bangladesh indicates that non-religious schools and madrasas are serving as a conduit for norm transmission to pupils, above and beyond the influence of their own parents and the socioeconomic environment. Therefore, female secondary school graduates may come to have different preferences regarding their marriage, fertility, employment and the education of their own children, as a consequence of their exposure to the schooling environment. However, the direction of causality can be reversed in the sense that social norms prevailing in the community dictate secondary education enrolment of daughters conditional upon presence of a madrasa. In this paper, we explore these social determinants of secondary schooling for girls. As a by-product, our analysis presents a new explanation for the growing demand for madrasa education in Bangladesh.

Empirical research into the determinants of madrasa schooling in Bangladesh is limited. Existing studies recognize parental religiosity or personal belief as a relevant factor but maintain that economic considerations dominate as the principal motive for sending children to registered madrasas (Asadullah, *et al.* 2012). Indeed, registered schools and madrasas in Bangladesh differ significantly in terms of costs and physical inputs. On average, schools have a bigger land area, are better inspected by the government, and have a larger proportion of trained teachers. They also charge higher fees and pay a higher salary to their teachers. Looking at average test scores in mathematics and English, we found that non-religious schools perform slightly better while, as expected, madrasas have a clear advantage when it comes to religious studies (World Bank 2010). However, there has been no study that investigates the correlates of madrasa schooling separately for girls. This is despite the fact that non-religious schools and madrasas (at the

secondary-level) differ significantly in non-academic aspects that have potential gender differentiated implications for cognitive and non-cognitive development of children.

In general, existing analyses of schooling decisions in Bangladesh and other developing countries confirm the importance of distance to school for secondary school attendance (Filmer 2007, Asadullah, *et al.* 2012). Studies that explore this issue by sex report that compared to boys, schooling outcomes of girls are more sensitive to availability of local school (Alderman, *et al.* 1996, Sathar and Lloyd 1994, Lloyd, *et al.* 2002), reduction in distance to school (Duraismy 1992, Glick 2008), and the availability of NGO-run schools in the village (Sukontamarn 2005). If girls are indeed less likely to travel long distances to attend high schools, *purdah* restrictions imposed by madrasas may provide them with an advantage in remote, conservative communities. In-depth, comparative analysis of dress codes and *purdah* norms across (non-religious) secondary schools and madrasas in Bangladesh is rare. An exception is the quality of secondary school madrasa education in Bangladesh (QSSMEB) study which collected detailed data on dress code from 322 rural secondary schools and madrasas (World Bank 2010). This survey explicitly looked into this issue and included interviews with the school principals about the prevalence and implementation of Islamic dress codes by sex.

Table 1. Presence and nature of policy regarding uniform for female students

	No official uniform	If yes, what type of uniform?				N
		Burka	Shalwar-Kamiz	Nikab	Head-scarf/cover	
Non-religious School	0.11	0.01	0.87	0.03	0.38	199
Aliyah Madrasa	0.15	0.69	0.30	0.10	0.35	123

Note: (a) Calculations are based on co-educational or girls-only institutions (i.e. boys-only institutions are excluded from the calculations). (b) This table is based on multiple responses. Therefore, a madrasa can report of having all the 4 types of uniforms – *burka* (body covered but face visible), *salwar-kamiz* (tunic-pant set), *nikab* (*burka* with eyes visible only), and head scarf. (c) All numbers refer to fractions. (d) Source: QSSMEB data (World Bank 2010).

Table 1 reports data on official policies related to female dress code in school. Most non-religious schools and madrasas impose a dress code on female students (89% and 85%, respectively). But overall, schools practice a more liberal dress code. In all madrasas, 69% of girls are required to wear ‘*burka*’ (compared to 1% of schools). Similarly, the incidence of ‘*nikab*’ (covering of the entire body, head and possibly face) is most common in madrasas (10% compared to 3% for non-religious schools). In the QSSMEB survey, the principals were also asked to comment on any official policies relating to the practice of ‘*purdah*’ inside the madrasa/school compound. Madrasas appeared to strictly implement the policy of ‘*purdah*’ irrespective of whether the pupil is outside or inside the classroom; 85% of madrasas require female pupils to practice ‘*purdah*’ inside the classroom compared to only 18% of non-religious school students.

3. Background on *Purdah* Norms in Bangladesh

The main hypothesis that we propose to test in this paper is whether traditional social norms, which impose restrictions on the mobility of rural women in Bangladesh outside of their homes, may be relaxed in the case of madrasa attendance by girls of secondary school age. Therefore, in this section, we briefly considered the literature on social norms regarding women's mobility in Bangladesh and considered how they may have been affected by increased access to madrasas for girls at the secondary level during the 1990s.

It is important to note that norms regarding women's mobility can vary considerably with the age and socioeconomic class of the woman, as well as with the geographical setting. BK Paul (1992) writes

"Although the neighbourhood boundary generally determines the extent of female space in rural Bangladesh, the area may vary in size according to a woman's economic status, age, and religion, as well as the geographical location and size of the neighbourhood. Women from different economic classes are subject to varied types and degrees of patriarchal control."

Of particular relevance for the present study is the notion that the rules regarding women's movements outside of the home are age-specific:

"Before marriage, girls pass through infancy, childhood, and adolescence in the parental home. They usually are secluded there between menarche and marriage. Notions of purity and morality underlie this restriction on spatial movement... " (ibid)

With the majority of women marrying before the age of 18 in Bangladesh (Schuler *et al.* 2006), the more stringent restrictions on mobility would apply precisely when a woman is of secondary school-going age. A number of authors have concluded that norms which restrict women's mobility in rural Bangladesh are directly responsible for their lack of access to education (Rahman 1994, Zaman 1995). However, it would be wrong to regard social norms relating to women's mobility as rules that are fixed, precise and non-negotiable. White (1992) remarks that

"the *purdah* culture [i.e. the rules regarding social settings in which it may or may not be appropriate for a woman to appear] is much more flexible than it appears in its notions of space and the varieties of activity it can accommodate... .. the notions of 'outside' (*bahire*) and 'inside' (*bhitore*) are figurative, not simply literal terms; their content is not set, but variable."

Agarwal (1997) has argued that '*purdah*' is being challenged and shaped in Bangladesh by urban

women employed in the garments industry and rural women who take part in NGO activities to receive training and credit for income generation. In this paper, we explore the possibility that a similar process may have been initiated by the increased availability of madrasas for female secondary schooling during the 1990s.

The *burka*, which is the most common type of uniform in the majority of Aliyah madrasas, can potentially play an important role in this process. In a study of *purdah* norms in two districts in Bangladesh, Balk (1997) notes that "the norm [regarding women's mobility] [is] that women should be accounted for and protected by a man when they are in public. Similarly, a *burka* is supposed to afford social status and protection. Thus, *burka*-wearers are considered to be ardent subscribers to the norm seclusion of females." Therefore, it is possible that madrasa students who travel outside of their traditional space adorned in a *burka* are not perceived as violating mobility norms.

However, this explanation raises the question why female pupils in secular institutions do not wear a *burka* over their uniforms on way to school to overcome the constraints on mobility imposed by social norms. A possible reason is that, from the point of view of village households, it is expensive to provide school children with a *burka* as an accessory to their official (secular) school uniform. Balk reports that, in her study sample, although women readily acknowledge the mobility advantages provided by the *burka*, few women use it in practice, probably because it is a relatively expensive garment to own (Balk 1997).

In the following sections, we formalise and test the hypothesis introduced in this section using data on secondary school attendance and measures of the strictness of mobility norms across sub-districts in Bangladesh.

4. Analytical Framework

In this section, we describe an analytical framework of school choice in the presence of social norms regarding female mobility. We assume that decisions regarding school attendance and school choice are determined by the perceived costs and benefits to households with school-age children. This approach is based on the human capital approach to education (Becker 1964), and akin to the analytical framework adopted by previous studies that have investigated the school choice in developing countries (Gertler and Glewwe 1990, Lavy 1996, Alderman, *et al.* 2001, Glick and Sahn 2006, Asadullah, *et al.* 2012). We aimed to motivate the econometric specification used in the empirical analysis and to illustrate the main narrative in the paper. The key ideas in our framework can be stated as follows:

1. Parents would prefer their children to have secondary schooling rather than not, if everything else is equal.

2. There is a disutility from sending one's child to school associated with the distance to the school. This may be due to the time cost of travelling to school, concerns about the children's safety and security, and norms relating to female mobility which disapprove of adolescent girls moving about far from their homes.

3. The perceived benefit from schooling may differ for secular schools and madrasas, and for boys and girls.

4. The monetary cost of sending a child to a madrasa is lower than that for sending a child to a secular school.

5. The social constraint on female mobility is more relaxed when a girl child is travelling to a madrasa than to a secular school.

The first four statements are, we would argue, reasonable given the context of our study. The fifth statement is a hypothesis that we aim to test indirectly, using data on enrollment rates and measures of social norms across sub-districts in Bangladesh.

We consider school enrollment and school choice as decisions made by households (or, more precisely, parents of school-age children) which vary in terms of i) perceived benefits of schooling for male and female children; ii) perceived benefits of non-religious and madrasa education; and iii) wealth. Moreover, households are situated across communities which vary in terms of the proximity of secondary educational institutions and gender norms regarding female mobility.

When deciding whether or not to send a child to school and the type of institution, parents weigh the direct benefits of schooling (in terms of increased employment opportunities and future earnings) against the monetary costs of schooling, and the psychological cost associated with having the child travelling some distance away from home (the second assumption above). The psychological cost increases with the distance to school, and in the case of a girl child, more so in communities which observe stricter norms regarding female mobility. Parents opt to enroll their children in school if and only the net benefit of either type of schooling (non-religious or madrasa) is greater than the combined cost of school fees and costs related to the physical distance to the school.

Given our assumptions, the following theoretical results should be evident.

(i) The probability of school enrollment declines with the distance to non-religious schools and madrasas for both boys and girls.

(ii) The probability of female school enrollment is lower in communities which practise stricter norms regarding female mobility.

(iii) The probability of female school enrollment is more responsive to the distance to either type of school in communities which practise stricter norms regarding female mobility.

Moreover, we can show that if the perceived benefits of schooling are similar across boys and girls, then female school enrollment should be more sensitive to distance to the nearest school than male school enrollment.

5. Methodology and Data

Econometric Specification

We allow the latent decision of going to secondary school or not to depend on individual and household characteristics X_{ij} , community level measure of gender mobility norm Z_j and school density in the sub-district S_j . For the i^{th} child and j^{th} sub-district, we can write the regression function as follows:

$$SCH_{ij} = S_j \alpha + X_{ij} \beta + Z_j \mu + \varepsilon_{ij}$$

We estimate equation (1) as a probit regression model for school age children. X includes age of child and the household's wealth index as the explanatory variables. Z is an index for female mobility within the household cluster (which we treat as "community"). The index ranges from 1 to 3, where a value of 1 means all women in the community have final say in decisions relating to visits to friends and relatives. A value of 2 means that this final say is shared with someone else in the household. A value of 3 means that the final say rests entirely with someone else. We re-estimate equation (1) separately by splitting the sample sub-districts according to whether they were above or below the median in terms of gender norms. Our prior is that the greater presence of madrasas has a positive effect on female enrollment in the more 'conservative' sub-districts, and no effect on the more 'progressive' sub-districts.

Since our measure of community social norm enters equation (1) as an aggregate variable, it raises a number of methodological issues. Firstly, it could be correlated with community-specific unobservables (the 'correlated effect' in the terminology of Manski (2000)) that also matter for child schooling. Secondly, individual schooling may also vary with the mean outcomes in the group (the 'endogenous social effect' in the terminology of Manski (2000)). Lastly, there may be a sample selection problem if households choose to live in a given village on the basis of some unobserved factors that, in turn, influences the schooling decision.

For our analysis, we assume away endogenous social effects and sorting of households. To test whether our measure of community mobility norm Z can reasonably be defended as being exogenous, however, we estimate equation (1) by replacing mobility measure with alternative measure of female autonomy. If our measure of community mobility norm is exogenous, it should be negatively correlated with the probability of female school attendance. But re-estimating the equation with other measures of female autonomy should not yield a statistically significant and negatively signed μ .

Lastly, the availability of madrasas may also be subject to endogeneity bias-related concerns. Madrasas may be set up to cater to the preferences of some conservative rural households by imposing dress codes that are culturally more appealing to certain parents. However, we already control for community norms. Besides, our measure of the supply of schools and madrasas are aggregate and hence beyond the influence of an individual household.

Description of the Data

Testing the predictions of the model discussed in section 4 requires household information on school-age children along with data on community characteristics and gender norms. Ideally, one would use the Bangladesh Household Income and Expenditure Survey (HIES) data for this purpose. Whilst the dataset is rich in community level information on the availability of schools and various other non-educational facilities, it provides no information on female empowerment and autonomy at the household and/or community level. Therefore, we used data from the Bangladesh Demographic and Health Survey (BDHS) 2007 for our purpose. Whilst this dataset has a complete module on empowerment and female autonomy, it does not provide any information on supply of schools in the community. To circumvent this problem, we merged BDHS data with a census on secondary educational institutions in Bangladesh at *upazila* level. The secondary school census data were obtained from BANBEIS. In addition, we combined the dataset with data from a companion survey of all sample communities that were carried out by NIPORT.

6. Results

Table 2 shows the estimated coefficients for our main specification. Columns 1 and 4 show the estimates for the sample boys and girls aged between 10 and 20 years, who have completed primary school. The probability of secondary school attendance increases with age, up to age 15, for both boys and girls, which suggests that there is substantial variation in the age at which children enroll into secondary school. The probabilities decline marginally at higher ages, indicating that younger cohorts are more likely to enroll in secondary school. The coefficients for the wealth quintiles show that children from richer households are, in general, more likely to enroll in secondary school.

Table 2 Probit model estimates of determinants of school attendance (dependant variable = 1 if child attending secondary school; 0 otherwise)

	Boys			Girls		
	Full sample	Mobility > Median	Mobility < Median	Full sample	Mobility > Median	Mobility < Median
age11	0.234 (6.53)**	0.177 (3.59)**	0.302 (5.68)**	0.298 (9.97)**	0.264 (6.61)**	0.338 (7.52)**
age12	0.361 (11.68)**	0.323 (7.69)**	0.411 (8.83)**	0.369 (13.94)**	0.36 (10.58)**	0.38 (9.22)**
age13	0.484 (16.65)**	0.445 (11.02)**	0.529 (12.40)**	0.441 (19.06)**	0.421 (14.02)**	0.461 (12.90)**
age14	0.526 (19.23)**	0.494 (13.09)**	0.565 (14.00)**	0.466 (21.51)**	0.449 (16.06)**	0.483 (14.31)**
agr15	0.544 (20.34)**	0.524 (14.34)**	0.571 (14.25)**	0.483 (22.97)**	0.457 (16.46)**	0.511 (16.00)**
age16	0.531 (19.62)**	0.509 (13.78)**	0.561 (13.85)**	0.48 (22.70)**	0.456 (16.48)**	0.505 (15.58)**
age17	0.505 (17.61)**	0.441 (10.80)**	0.566 (13.85)**	0.454 (20.33)**	0.412 (13.45)**	0.496 (15.18)**
age18	0.482 (16.95)**	0.458 (11.88)**	0.516 (12.04)**	0.462 (20.44)**	0.435 (14.70)**	0.493 (14.30)**
age19	0.447 (14.19)**	0.382 (8.46)**	0.511 (11.41)**	0.448 (19.78)**	0.412 (13.44)**	0.487 (14.49)**
age20	0.451 (15.50)**	0.39 (9.53)**	0.517 (12.18)**	0.45 (19.68)**	0.412 (13.41)**	0.492 (14.36)**
Wealth: poorer	0.149 (6.25)**	0.191 (5.07)**	0.115 (3.74)**	0.112 (5.17)**	0.07 (2.06)*	0.142 (4.97)**
Wealth: middle	0.215 (9.33)**	0.258 (7.35)**	0.183 (5.92)**	0.201 (9.63)**	0.209 (6.68)**	0.187 (6.61)**
Wealth: richer	0.276 (12.07)**	0.298 (8.68)**	0.264 (8.54)**	0.263 (12.79)**	0.254 (8.34)**	0.272 (9.62)**
Wealth: richest	0.302 (13.32)**	0.344 (10.32)**	0.272 (8.66)**	0.227 (11.13)**	0.198 (6.58)**	0.277 (9.95)**
Population under 18/# of non-religious schools	-0.006 (2.25)*	-0.023 (3.83)**	0 -0.11	-0.006 (2.57)*	-0.02 (3.54)**	0 -0.05
Population under 18/# of religious schools	-0.002 (2.49)*	-0.001 -1.01	-0.003 (2.65)**	-0.003 (4.55)**	-0.001 (2.03)*	-0.006 (5.64)**
Mobility	0.007 -0.1			0.166 (2.37)*		
Observations	6247	3084	3163	7127	3520	3607
Pseudo R2	0.14	0.14	0.14	0.15	0.15	0.15

Notes: ** Significant at 1%; * Significant at 5%; + Significant at 10%. Standard errors in parenthesis; adjusted for clustering at sub-district level.

The coefficients for our three main variables of interest are reported at the bottom of the table. First, we note that the probability of secondary school attendance declines with the ratio of school-age population per institution, for each type of school, and for both boys and girls. We interpret this result as saying simply that attendance is affected by the availability of non-religious schools and madrasas in the sub-district. The probability of secondary school attendance is affected by our measure of social norms relating to female mobility, but only for girls. Girls are less likely to have attended a secondary school if fewer married women in the sub-district report being able to visit friends or family without seeking permission from another member of the household. The result corroborates the assessment by previous authors that social norms regarding women's mobility acts as an obstacle for female education in rural Bangladesh, as discussed in Section 4. The corresponding effect for boys is insignificant, which suggests that the measure is not merely serving as a proxy for wealth.

Next, we split the sample into two groups of sub-districts according to whether the extent of female mobility is above or below the median. The coefficients are reported in columns 2 and 3 for boys, and 5 and 6 for girls. In sub-districts which are more 'progressive', in the sense that women have a relatively high level of mobility, the effect of the availability of madrasas on attendance is the same for boys and girls. The effect of the availability of non-religious schools on attendance is also similar for boys and girls, with the difference being statistically insignificant. We interpret these results as saying that if social constraints on female mobility are not too severe, then, *ceteris paribus*, parents are equally willing to send their sons and daughters to school, depending on availability.

But in the sub-districts that are more 'conservative' in terms of female mobility, the availability of madrasas raises the probability of secondary school attendance for girls six times as much as in the more 'progressive' sub-districts. This implies that madrasas relax some constraint on female schooling to a far greater extent in the 'conservative' sub-districts than in the 'progressive' sub-districts. In contrast, the availability of non-religious schools has no effect on female school attendance in the 'conservative' sub-districts. So, it would appear that parents are unwilling to send their daughters to non-religious school in these sub-districts even where they are more accessible. Availability of non-religious school does not affect school attendance for boys either in these sub-districts.

The results relating to madrasas noted in the preceding paragraph are consistent with the theoretical predictions discussed in the previous section; i.e. in the more 'conservative' sub-districts, female schooling is more sensitive to the availability of madrasas. However, there is no mechanism in our analytical framework which would cause male and female schooling in the 'conservative' sub-districts to be less sensitive to the availability of non-religious schools, as we observe in the data. This implies that our measure of norms relating to female mobility is, in fact, capturing some other aspect of the community which makes parents more reluctant to send their

sons and daughters to non-religious schools. In practice, this could happen if our measure of community norms is correlated with the perceived net benefit of schooling.

It is possible that our measure of community norms regarding women's mobility is serving as a proxy for female autonomy, broadly defined, which is correlated with wealth or perceived benefit of madrasa education. If so, this would produce a bias in our estimates. To explore this possibility, we replace the variable on women's mobility with other measures of women's autonomy, constructed along the same lines. Specifically, we calculate the proportion of married women in the sub-district who reported making decisions regarding (i) their own health, (ii) daily household purchases, and (iii) large household purchases independently of other household members (Table 3). For each measure, we found that the corresponding coefficient is insignificant for girls. In the case of full sample of boys and girls, the coefficients for daily household purchases and large household purchases are significant at 10% level. But, overall, the gender pattern is unlike what we obtained with our measure of women's mobility. Therefore, these results provide some evidence that the previously estimated effects are being driven by women's mobility per se rather than women's autonomy, more broadly defined.

Table 3. Probit model estimates of determinants of school attendance using alternative dimensions of female autonomy (dependant variable = 1 if child attending secondary school; 0 otherwise)

	Independent say in health decisions		Independent say in large household purchases		Independent say in daily household purchases	
	Boy	Girl	Boy	Girl	Boy	Girl
Age: 11 years	0.234 (6.53)**	0.298 (9.98)**	0.235 (6.54)**	0.298 (9.97)**	0.234 (6.53)**	0.299 (9.99)**
Age: 12 years	0.361 (11.68)**	0.369 (13.93)**	0.361 (11.69)**	0.369 (13.93)**	0.362 (11.71)**	0.369 (13.94)**
Age: 13 years	0.484 (16.64)**	0.441 (19.06)**	0.484 (16.66)**	0.441 (19.07)**	0.484 (16.66)**	0.441 (19.06)**
Age: 14 years	0.526 (19.22)**	0.466 (21.50)**	0.526 (19.23)**	0.466 (21.51)**	0.526 (19.24)**	0.466 (21.52)**
Age: 15 years	0.544 (20.34)**	0.483 (22.97)**	0.544 (20.36)**	0.483 (22.97)**	0.544 (20.33)**	0.483 (22.96)**
Age: 16 years	0.531 (19.62)**	0.48 (22.69)**	0.531 (19.65)**	0.48 (22.70)**	0.532 (19.63)**	0.48 (22.70)**
Age: 17 years	0.505 (17.59)**	0.454 (20.31)**	0.505 (17.62)**	0.454 (20.31)**	0.505 (17.61)**	0.454 (20.31)**
Age: 18 years	0.482 (16.94)**	0.461 (20.41)**	0.482 (16.95)**	0.461 (20.42)**	0.482 (16.94)**	0.461 (20.41)**
Age: 19 years	0.446 (14.18)**	0.448 (19.75)**	0.446 (14.16)**	0.448 (19.76)**	0.447 (14.19)**	0.448 (19.75)**
Age: 20 years	0.451 (15.48)**	0.45 (19.65)**	0.451 (15.48)**	0.45 (19.65)**	0.452 (15.52)**	0.449 (19.64)**
Wealth: poorer	0.149 (6.28)**	0.114 (5.25)**	0.15 (6.30)**	0.113 (5.22)**	0.149 (6.24)**	0.115 (5.29)**
Wealth: middle	0.217 (9.41)**	0.203 (9.73)**	0.219 (9.49)**	0.203 (9.72)**	0.215 (9.36)**	0.205 (9.87)**
Wealth: richer	0.278 (12.19)**	0.266 (12.95)**	0.281 (12.31)**	0.266 (12.92)**	0.275 (12.16)**	0.269 (13.22)**
Wealth: richest	0.305 (13.55)**	0.232 (11.52)**	0.309 (13.66)**	0.23 (11.35)**	0.299 (13.40)**	0.235 (11.73)**
Population under 18/# of non-religious schools	-0.006 (2.29)*	-0.007 (2.62)**	-0.006 (2.36)*	-0.006 (2.59)**	-0.005 (2.11)*	-0.007 (2.64)**
Population under 18/# of religious schools	-0.002 (2.45)*	-0.003 (4.60)**	-0.002 (2.42)*	-0.003 (4.61)**	-0.002 (2.46)*	-0.003 (4.57)**
Autonomy: Health	-0.056 -0.73	0.081 -1.16				
Autonomy: Major Purchases			-0.167 (1.63)	0.141 -1.45		
Autonomy: Daily					0.096 (1.86)+	0.015 -0.31
Pseudo R2	0.14	0.15	0.14	0.15	0.14	0.15
Observations	6247	7127	6247	7127	6247	7127

Notes: See Table 2.

7. Understanding the causes of conservative mobility norms

The finding that female school attendance is correlated with mobility norms as defined above, and more responsive to the availability of madrasas in sub-districts with conservative norms raises an obvious question: what is the driver behind conservative norms regarding female mobility? The question is important for two reasons. Firstly, if communities with conservative norms are also lacking in terms of educational infrastructure or other facilities which might

directly influence female schooling, then the statistical relation reported in the preceding section is unlikely to be causal. Secondly, if conservative norms are driven by concerns about the security of adolescent girls in public spaces rather than religious or social values², then this would have quite different implications for policies aimed at promoting female secondary education.

Predictors of female autonomy at the individual level

To address the first issue, we conducted an exercise to explain female autonomy along different dimensions at individual level. Specifically, we estimated probit models where the dependent variables are binary variables indicating whether a woman has final say in visiting friends and family, in decisions regarding her health, and in making daily and major household purchases. The explanatory variables include individual and household characteristics including her age, education, status within the household, and wealth quintile of the household; and characteristics of her community, including the type of the locality (urban or rural), access to telephone lines and electricity, main access road, the presence of women's organizations, NGO activities, and the availability of health facilities.

² According to BNWLA 2010 almost 90% of the girls aged 10-18 in Bangladesh have undergone some form of sexual harassment. In particular, 36% female students experienced sexual harassment in front of school (BRAC, 2010).

Table 4. Probit estimates of determinants of female mobility (dependent variable = 1 if women has final say in visiting friends or family; 0 otherwise)

Age	0.0204 (0.003) **
Age-squared	-0.0003 (0.000) **
Education (yrs)	0.0012 (0.001) *
Muslim	0.0378 (0.010) **
Age of spouse	0.0016 (0.000) *
Education of spouse	0.0004 (0.001)
<u>Relation to Household Head ('wife' omitted)</u>	
head	0.5692 (0.021) **
daughter	0.1007 (0.018) **
daughter-in-law	-0.0387 (0.012) *
grand-daughter	0.1056 (0.156)
mother	0.1305 (0.063) *
mother-in-law	0.1346 (0.085)+
sister	0.1006 (0.036) **
other relative	0.0371 (0.022)+
<u>Wealth Quintile (bottom quintile omitted)</u>	
2nd poorest	-0.0060 (0.012)
middle quintile	-0.0044 (0.011)
2nd richest	0.0051 (0.012)
richest	0.0163 (0.013)
Ladies' association	0.0018 (0.011)
Grameen Bank	-0.0123 (0.006)*
BRAC income activities	-0.0033 (0.010)
All Weather Road	0.0142 (0.009)
Telephone Service	-0.0041 (0.005)
Electricity	-0.0024 (0.002)
Rural	-0.0221 (0.008)**
Family Planning Services	0.0179 (0.008)**
# Health clinics	0.0006 (0.002)
# Health service workers	-0.0019 (0.003)
Observations	10064
Pseudo R-square	0.155

Notes: See Table 2.

Some of the individual characteristics such as age, education and whether or not the woman is the head of the household are important predictors of her autonomy. By contrast, the effects from the community-level variables are relatively small and, in most cases, statistically insignificant; with the exception of the rural/urban variable and the type of main access road to the locality. A model of female autonomy regarding mobility that includes only the individual variables produces a pseudo R-square of 0.152 while a model that includes only the community-level variables produces a pseudo R-square of 0.007 (estimation not shown) and the corresponding values for the other autonomy variables are similar (Table 4).

These results suggest that the observed differences in female mobility are primarily due to differences in individual characteristics rather than the characteristics of the communities (e.g. differences in educational infrastructure) in which they reside. Therefore, the variations in average female autonomy that we observe at community level are driven by the demographic composition of its (female) members, rather than differences in resources or facilities available across communities. Therefore, it is unlikely that the correlation between female schooling and female mobility is being driven by unobserved differences in available infrastructure.

Reasons for Purdah and schooling choice

Addressing the second issue raised above would require more specific information about why women or adolescent girls are restricted in their movement within their communities. This type of information is not available in the Bangladesh Demographic and Health Surveys. Fortunately, there exists an alternative nationwide survey, the Bangladesh Adolescent Survey 2005 (BAS 2005), conducted by the Population Council, in which adolescents who practice *purdah* in some form outside their homes were asked why they were required to or chosen to do so. The respondents were able to choose their answers from a list which included the explanations like ‘security’, ‘religious reasons’, ‘social reasons’, and ‘told to do so by family members’, as well as provide reasons of their own. The survey also obtained information on whether the respondents were currently attending, or had ever attended a madrasa or a non-religious school.

Table 5. Probit estimates of madrasa attendance using BAS 2005 data (Dependent variable: 1 if ever attended Madrasa; 0 otherwise)

<u>Age categories (10 year olds omitted)</u>	
11 yrs	0.230 (0.099)*
12 yrs	0.303 (0.108)**
13 yrs	0.419 (0.107)**
14 yrs	0.291 (0.112)**
15 yrs	0.207 (0.123)+
16 yrs	0.213 (0.118)+
17 yrs	0.147 (0.120)
18 yrs	0.118 (0.117)
19 yrs	0.069 (0.125)
20 yrs	-0.212 (0.114)+
21 yrs	-0.104 (0.137)+
22 yrs	-0.343 (0.131)**
23 yrs	-0.361 (0.140)**
24 yrs	-0.314 (0.170)+
<u>Reasons for Purdah ('no purdah' omitted)</u>	
Security	0.365 (0.170)*
Religion	0.507 (0.163)**
Social norms	0.161 (0.195)
Family reasons	0.283 (0.233)
Personal reasons	0.303 (0.292)
No reason given	0.553 (0.484)
Constant	-1.720 (0.173)**
Observations	6554
Pseudo R-square	0.0305

We used BAS 2005 data to test whether adolescent girls who provided certain answers to explain their use of *purdah* are more likely to have attended a madrasa than others. Gani (2007) provided a detailed description of the survey. The BAS survey method was similar to BDHS method. The survey clusters for both BAS 2005 and BDHS 2004 were randomly selected from the same 1,000 primary sampling units used by the Bangladesh Bureau of Statistics to generate district-level statistics. From each cluster, 60 households were selected for the survey, and one adolescent aged 10-24 chosen from each household with one or more adolescents. Thus, the final sample included 21,656 households and 14,942 adolescents.

Appendix Table 1 provides descriptive statistics on *purdah* practice for all female adolescents interviewed in the survey. More than 90% of respondents practice some form of *purdah*; the two most commonly provided reasons are personal security and religion. There is substantial variation in the corresponding figures across the 7 administrative divisions of Bangladesh, with the frequency of reported use of *purdah* for religious reasons ranging from 38% for Dhaka division to nearly 70% for Barisal division (the corresponding figure for Sylhet, generally considered the most religiously conservative of the divisions, is slightly above the national average at 51%).

We considered the sub-sample of female Muslim respondents aged 10-24 years who ever attended any type of school, and estimated a probit model using their individual characteristics to estimate the probability that they have attended a madrasa during any year of schooling. We included a categorical variable which takes a value of zero if they do not observe *purdah*, and 1 through 5 if they observe *purdah* out of security concerns, religious reasons, social reasons, family reasons or personal reasons, respectively. Table 5 shows the results.

Girls who observe *purdah* both for security and religious reasons are significantly more likely to have attended madrasas than those who do not practice *purdah*. The coefficients corresponding to the other three explanations are also positive but smaller in magnitude and not statistically significant.

The relationship between observance of *purdah* due to religious reasons and madrasa attendance may be driven by reverse causality; girls who enroll in madrasas are more likely to be taught subsequently that they should practice *purdah* due to religious reasons. Moreover, religiously conservative parents are more likely both to enroll their daughters in madrasas and teach them that the practice of *purdah* is part of their religious duty. But it is impossible to apply the same reasoning for girls who practice *purdah* for their security. There is no obvious reason why girls who enroll in school should thereafter feel more inclined to practice *purdah* for security; and no obvious reason why parents who prefer a madrasa education for their daughters would also require them to observe *purdah* out of security concerns. Therefore, the statistically significant coefficient for security concerns gives support to the hypothesis that the relationship between the practice of *purdah* and madrasa attendance is causal.

The statistically insignificant coefficient for social norms need not imply that the observance of *purdah* norms is an unimportant factor behind madrasa attendance. But the effect does not seem to be strong enough to be confirmed in this dataset; and security concerns appear to be a more important factor.

8. Conclusion

It has previously been noted in the literature that social norms which restrict women's mobility in rural Bangladesh has historically served as an obstacle for providing education for girls. Given that the social constraint on women's mobility is the strongest between the ages of menarche and marriage, the obstacle is most acute in the case of secondary education. During the 1990s, however, Bangladesh experienced a dramatic rise in the female enrolment rate in secondary schools. The registered religious school system, which previously catered almost exclusively to boys, quickly became a coeducational institution in response to financial incentives from the Bangladesh government. In this paper, we explored a precise mechanism through which the demand for female secondary schooling may have responded to the new supply of madrasa education for girls.

We found that the enrolment rate of girls in secondary school is six times more responsive to the availability of madrasas in sub-districts where social norms regarding female mobility are below the median compared to sub-districts where it is above the median. We also found that the female school enrolment rate does not respond to other dimensions of female autonomy, which suggests that the effect of madrasa availability in the more conservative districts is not simply due to 'conservative values', broadly defined, which gives lower priority to education for girls compared to education for boys. We interpret these findings as providing evidence that the recent rise of madrasas for female secondary education in Bangladesh have helped relax social constraints on women's mobility, particularly in regions which are culturally 'conservative' along this dimension.

We identified a possible mechanism through which madrasas may have helped relax mobility constraints for female school pupils. *Burka*, which serves as school uniform in majority of the Aliyah madrasas in Bangladesh has traditionally been a means for women to venture into public space without a male chaperon and without violating socially prescribed norms. Although we do not provide any direct evidence in this regard, we propose that the *burka* has been a significant factor behind the rise in female enrolment in madrasas, and thus a significant factor in achieving gender parity at the secondary school level in Bangladesh.

This narrative provides an example where a conservative institution -- the wearing of the *burka* - - which is usually seen as restricting women's autonomy and liberty, has led to a progressive outcome by facilitating women's access to secondary education in Bangladesh. This, of course, does not imply that a more widespread adoption of the *burka* as a uniform for female students in secondary schools will translate into more progressive outcomes, as changes of this kind may have other unintended consequences, including the perception of gender inequality within educational institutions, or a shift in social norms towards greater conservatism within the wider society. Nevertheless, the possible role that madrasas have had in relaxing social constraints on

female mobility, highlighted in this paper, suggests that a suitable compromise with conservative cultural practices can ultimately help to achieve more progressive outcomes, including greater access to secondary education for girls in rural Bangladesh.

In Muslim countries where social and cultural obstacles to educate girls are significant, a strategic mix of conventional (e.g. madrasa) and progressive interventions (e.g. the female stipend scheme) can be successful in bringing large number of girls to secondary education³. This combination has gone beyond overcoming financial barriers as it also apparently succeeded in meeting cultural demands. However, to some extent greater participation in madrasa is the consequence of perceived lack of physical security. Further institutional support is needed to aid female school participation, particularly from families that are ideologically opposed to faith education. As a by-product, therefore, our study provides justification for interventions that directly help females to overcome social barriers irrespective of the type of school attended. A notable example is the *Meyeder Jonnyo Nirapod Nagorikotto* (MEJNIN) programme of BRAC in Bangladesh which is designed to educate adolescent girls and the community on sexual harassment. The programme runs workshops at schools and creates support across the community to combat the issue. During the workshops, students create School Watch Committees that provide assistance to the abused. The committee is also responsible for keeping the school authority informed about any event of sexual harassment. In addition, teachers and community members create Community Watch Groups of their own to aid female victims. The programme is in the process of expanding into ten districts in Bangladesh within the next two years. Future research on school choice in MEJNIN programme and non-programme areas will shed further light on the nature of cultural barriers (safety concerns vs. mobility norms) to female education in Bangladesh.

³ A relevant example is the Community Support Process (CSP) Programme in Pakistan which led to a significant increase in attendance for rural girls. CSP involved provision of segregated girls' primary school in each programme community, staffed by female teachers. The program arguably succeeded in breaking cultural barriers to female schooling through a combination of parental participation and employment of local female teachers (Kim, Alderman, and Orazem, 1998).

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