MATERNAL EDUCATION AND HOUSEHOLD DECISIONS REGARDING CHILDREN’S PRIMARY SCHOOL ENROLLMENT: EVIDENCE OF FEMALE EMPOWERMENT IN PAKISTAN

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Rachel A. Bodily, B.A.

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MATERNAL EDUCATION AND HOUSEHOLD DECISIONS REGARDING CHILDREN’S PRIMARY SCHOOL ENROLLMENT: EVIDENCE OF FEMALE EMPOWERMENT IN PAKISTAN

Rachel A. Bodily, B.A.

Thesis Advisor: Gillette Hall, Ph.D.

ABSTRACT

In recent years, there has been a strong push for worldwide improvements in primary education. Many of the corresponding goals and policies find their foundation in a vast literature that demonstrates the wide-ranging benefits of educating females, including widely-accepted evidence that the children of educated women are much more likely to receive formal schooling. However, understanding of the causal mechanism that drives this relationship is lacking. This paper will use household survey data from the Learning and Educational Achievement in Pakistan Schools (LEAPS) Project from 2003 to further examine the role of maternal education in household decisions regarding children’s enrollment in primary school. Results from probit analysis indicate that higher maternal education levels increase the likelihood that a mother will participate in the decision to enroll her children in primary school, and do so in addition to the effect of maternal contributions to household income that higher education levels may allow. This paper also notes household and child characteristics that increase the likelihood of maternal participation in the household decision-making process and concludes with the policy implications of these findings.
To my thesis adviser, who helped me to find the right topic. To my workshop classmates and peer reviewers, who helped me to find the right content. To my statistics advisers, who helped me to find the right numbers. To my family, who helped me to find the right path.
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Introduction

In recent years there has been a strong push for worldwide improvements in primary education. The UN Millennium Development Goals set 2015 as the year for universal primary education achievement, and various UN Agencies, International Organizations, donor countries, and private foundations have dedicated significant resources to accomplish this goal. Many countries at all income levels have made considerable progress toward this goal and primary school enrollment and completion rates continue to climb throughout the world.

Universal primary education goals find their foundation in a vast literature that demonstrates the wide-ranging benefits of educating females. As educated females become educated mothers, there are few policy interventions that provide a greater stream of benefits. Higher levels of maternal education are associated with substantive improvements in numerous measures of educational and health outcomes for children; the increased educational attainment of her children is one important and highly publicized example. While the benefits of female education for the future education of her children are generally accepted as fact, understanding of the causal mechanism through which these benefits take place is lacking. Scholars have suggested higher levels of family income or an increase in household bargaining power as plausible explanations, but have arrived at few conclusive results.

This paper will use household survey data from the Learning and Educational Achievement in Pakistan Schools (LEAPS) Project from 2003 to further examine the role of maternal education in household decisions regarding children’s enrollment in primary school. While few alternative datasets with information on this topic exist, Pakistan also has merit as an interesting case study. Education levels in Pakistan are quite low, particularly for women. In the
LEAPS dataset, 70 percent of women have not received any formal schooling. Consequently, any level of maternal education has the potential for making a significant impact in a woman’s life and distinguishes her from the majority of her counterparts. The significant impact of female education in this context and the need for well-informed education policy to raise enrollment rates position Pakistan as a fascinating location for this investigation. A better understanding of the causal mechanism through which mothers influence the increased educational attainment of their children will help to achieve educational goals and devise policies that empower females.

**Literature Review**

The literature surrounding the relationship between women and development traces its roots to the work of Danish Economist Ester Boserup (1970). She contributed the first serious examination of the effects of economic and social growth on women in the Third World, addressing areas such as division of labor, conceptions of productivity, and the role of education. Her work helped to shape a consensus among female development professionals that development processes produced differential impacts on men and women and contributed significantly to the establishment of the Women in Development (WID) era (Pearson 2003). This approach placed an important focus on women as beneficiaries of economic growth and the creation of development programs targeted to meet women’s needs. Building on this momentum, Sen and Grown (1988) introduced the concept of female empowerment within the development framework. The authors provided evidence of the declines in the socioeconomic status of women in the 1970’s and 1980’s, despite WID policies geared toward the needs of women, to call for a change to development models. As members of a network of activists known as Development Alternatives for Women in a New Era (DAWN), Sen and Grown
presented a more equitable vision of development in which women had agency, control over resources and decisions, and the ability to contribute new solutions to development challenges.

A broad understanding of the critical role of female empowerment in a country’s economic development process began to take hold during the following years. Moser (1993) contributed a framework for gender-focused planning within development, while Kabeer (1994) provided an analysis of development theory within a feminist framework. Batliwala (1994) pointed to the need for female involvement in every stage of the development process, including project planning, in order to address their immediate physical needs in a way that improves their future position. All of these works highlighted the continued need for focused improvement of development programs to empower women.

The convergence of this growing literature with the increasing emphasis on participatory development, in contrast to traditional top-down policies, contributed to most major development agencies’ adoption and operationalization of the gender and development (GAD) agenda in the 1990s. Still popular, this approach focuses on gender constructs within society that impact the mechanisms of development (e.g. differences in men’s and women’s relationship with the environment) and pushes to change these paradigms through female empowerment (Pearson 2003). Empirical evidence also began to build and provide an illustration of the means through which female empowerment and gender equality enhance development. Higher levels of female empowerment have been found to increase economic growth within a country (Dollar and Gatti 1999; Klasen 1999), significantly reduce infant and child mortality rates (Jejeebhoy 1995; Hill and King 1995; Klasen 1999), decrease fertility (Jejeebhoy 1995), and even lower the HIV infection rate for high- and low-risk adults (Over 1998).
Malhotra et al.’s (2002) comprehensive review of the impact of female education on gender equality indicates the widely accepted role of education as a major factor in empowering women. The strong push for female education in the developing world is then an unsurprising consequence. Universal primary education targets established within the past decade cite the numerous positive outcomes of educating females as significant motivation. Higher levels of maternal education improve child health outcomes (Desai and Alva 1998) and allow mothers to provide better care even in the face of adverse household conditions (Thomas and Strauss 1992). Country household studies demonstrate that mothers’ education has a greater effect than household income on child health in disadvantaged communities in the Philippines (Barrera 1990), increases the likelihood of formal child care in Guatemala (Pebley, Goldman, and Rodriguez 1996), and positively impacts child immunization levels in Niger and Nigeria (Gage, Sommerfelt, and Piani 1997). Mother’s education increases the educational attainment of her children, with a stronger impact than the father’s education, and a woman’s increased earnings provide greater benefits to her children than a man’s (Schultz 2004; Chevalier, Harmon, O’Sullivan, and Walker 2005).

A vast body of literature demonstrates the positive effect of female education levels on economic growth, family health, and children’s educational attainment, but the causal mechanism through which such effects takes place is less clear. In regard to educational attainment, several authors acknowledge that women with higher levels of education are able to increase family resources and thus increase the number of children able to attend school (Birdsall and Behrman 1991; Appleton, Hoddinott, and Krishnan 1999). Another causal explanation is an increased role in household bargaining at higher levels of education, founded in the theory that
resource contribution will increase negotiating power within marital relationships and household decision-making (Mason 1998; Sengupta and Johnson 2003).

Malhotra and Mather (1997) argue for a more nuanced relationship between women’s education and household decision-making. They assert that the extent to which access to information and income are the source of power in a given cultural context determines the effects of education on empowerment. For example, results from survey and focus group data from Sri Lanka demonstrate that education enhances a woman’s input in financial decisions, but does not increase her ability to contribute to social and organizational matters within the home.

The aim of this paper is further examination of the relationship between a woman’s education level and household decision-making processes in order to provide a stronger understanding of the causal mechanism at play. Building on the work of Malhotra and Mather (1997), this paper will evaluate the relationship between maternal education levels and decisions regarding children’s education, to enhance understanding and inform policy surrounding female education and empowerment in the developing world.

**Conceptual Framework**

Two main theories propose mechanisms through which children of more educated women also attain higher levels of education. One plausible explanation for increases in children’s educational attainment is the existence of certain characteristics among more highly-educated women that allow them to take a more assertive role within the household. Several authors have identified the correlation between increased levels of education and a woman’s expanded role in household bargaining (Mason 1998; Sengupta and Johnson 2003). This enhanced role may be attributable to an increase in personal confidence or greater respect within
society that accompanies higher levels of education. Or perhaps more highly-educated women have opportunities to marry men with more equitable views of household decision-making. While this intervening step may as yet remain unknown, the overall implication is that education provides opportunities or develops certain attributes that enhance a woman’s position in household bargaining.

An alternative explanation for the positive effect of maternal education on children’s educational attainment is that of increased household resources (Birdsall and Behrman 1991; Appleton, Hoddinott, and Krishnan 1999). Women with higher levels of education have knowledge and skills that increase their earning capacity and ability to increase family income levels. Female contributions to household income alone may increase her bargaining power within the home (Lee and Peterson 1983). Alternatively, increased resources may ease the financial burden of sending children to school. In this case, the decision to send children to school has a proportionately smaller impact on household resources and thus becomes a less important decision without the household. Women, who traditionally hold less decision-making power, are more likely to play a role in less important household decisions. An increase in household income due to female financial contributions will decrease the significance of the decision surrounding children’s educational enrollment and increase the probability that a mother participates in this decision.

Both of these competing explanations for the positive effect of maternal education on children’s educational attainment may be valid. It is possible that women with higher levels of education develop certain qualities that both increase their ability to make household decisions and contribute more resources to the household. The empirical model discussed further below
will include variables for education and income to account for both effects. The following hypotheses will be tested using statistical analysis to determine the role of maternal education levels in the household decision-making process regarding children’s education.

H1. An increase in a mother’s level of education will raise the likelihood of her involvement in household decisions regarding children’s primary school enrollment.

H2. An increase in a mother’s contribution to household income will raise the likelihood of her involvement in household decisions regarding children’s primary school enrollment.

Methodology

Data

The Learning and Education in Punjab Schools dataset (LEAPS) contains extensive educational data from the Punjab area of Pakistan. The data were collected from school testing and surveys of 1,800 households and 823 schools (head masters, teachers, students). The World Bank, Pomona College, and Harvard University implemented the project. The full study was conducted from 2003-2007 to produce a longitudinal dataset, though only a cross-section of the data are used for this analysis.

The data used in this analysis originate from the household survey portion of the study only. The main survey target population was households with a child eligible for 3rd grade, though the age of entrance varies widely and information was collected for all children in the household aged 5-15. Grade 3 was used as selection criteria in order to match the household survey data with testing information in the schools. The survey was conducted in 3 districts of the Punjab region: Attock (North), Faisalabad (Central) and Rahim Yar Kan (South). Within
these three districts, 112 villages were chosen randomly from a list of all villages with an existing private school (for comparison). The survey question that informs the main dependent variable of interest was asked only in the first year of the study to all 1,800 households, so this analysis will only use data from the year 2003.

The sampling frame included households with children eligible for and enrolled in grade 3 (about 75 percent) and households with children eligible for and not enrolled in grade 3 (about 25 percent). However, data on the role of parents in the decision to send children to school are only available for children enrolled in school. Data regarding parental decisions of non-enrollment simply do not exist from this survey. Thus the analysis here focuses on the household decision-making process for children that have been enrolled in primary school. As exploration of the data revealed that parental involvement in the enrollment decision varied among children within the same household, the unit of analysis is one child.

Empirical Model

\[ Mother's \text{ Role in Household Decisions} = \beta_0 + \beta_1 (\text{Maternal Education}) + \beta_2 (\text{Paternal Education}) + \beta_3 (\text{Maternal Income}) + \text{Household Characteristics} + \text{Child Characteristics} + \mu \]

Dependent Variable

The equation above outlines the general model for this analysis. The dependent variable is the mother’s role in household decisions regarding her children’s enrollment in school. To measure this variable, the LEAPS Household Survey includes the following question: Who is most responsible for making the decision to send the child to primary school? The question is asked for each child in the household (age 5-15) that attends school, and the range of choices is as follows: mother, father, mother and father jointly, grandparent, older brother/sister, other
relative, friend of the family, or tutor. The non-parent choices comprise less than 2 percent of the observations, and in order to address the question at hand regarding the mother’s role in this process, these observations were excluded from analysis.\(^1\) The variable was then operationalized as a binary variable equal to 1 if the mother participated in the decision to send the child to school (whether she did so alone or jointly with the father) and equal to 0 if the father made the decision alone. Thus, the analysis will examine the effects of various circumstances on the likelihood that the mother participated in the decision-making process regarding children’s education in any capacity. Due to the binary nature of this variable, analysis will be conducted using probit regression.

\(^1\) One might argue that the elimination of these observations unnecessarily reduces the sample size, as they still provide information on cases in which the mother does not participate in the decision-making process. However, this study aims to analyze the household bargaining process between the mother and father over the education of their children, rather than the mother’s role as compared to the grandparent’s or the sibling’s role. Further, the gender of the alternate choices (e.g. grandmother vs. grandfather) was not provided, which prevented using the data to tell a broader story of general female empowerment within the household.
**Table 1:** Descriptive Statistics for Main Variables of Interest

<table>
<thead>
<tr>
<th>Description</th>
<th>Mean</th>
<th>SD</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who is most responsible for making decision to send child to school? (1=Mother involved in decision)</td>
<td>0.83</td>
<td>N/A</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Maternal Formal Education (years)</td>
<td>1.66</td>
<td>2.92</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>Maternal Formal Education (1=any education)</td>
<td>0.30</td>
<td>N/A</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Maternal Formal Education (1=primary school completion)</td>
<td>0.21</td>
<td>N/A</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Paternal formal education (years)</td>
<td>4.4</td>
<td>4.3</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>Education Differential: Paternal Education – Maternal Education</td>
<td>2.8</td>
<td>4.1</td>
<td>-12</td>
<td>16</td>
</tr>
<tr>
<td>Maternal monthly income contributions (Pakistani Rupees)</td>
<td>108.3</td>
<td>565.8</td>
<td>0</td>
<td>8,000</td>
</tr>
</tbody>
</table>

N= 3,698  
N/A=Not applicable

**Independent Variables**

The main independent variable of interest is the mother’s level of education. In order to most accurately test the hypothesis that higher levels of education will increase the likelihood of the mother’s participation in the household decision-making process, the analysis will include four different measurements of maternal education.
- Model 1: Mother’s education is measured as the number of years of education completed by the mother. It is measured as a continuous variable with values that range from zero to twelve years.

- Model 2: Mother’s education is measured as a binary variable equal to 1 if the mother has received any education and 0 if not.

- Model 3: Mother’s education is measured as a binary variable reflecting the completion of primary school. It is equal to 1 if she has completed at least primary school and 0 if not.

- Model 4: An education differential variable measures the level of a mother’s education subtracted from the level of a father’s education. The values range from -12 to 16 and the variable aims to explore if the relative difference between maternal and paternal education levels determines the mother’s role in children’s education decisions, rather than purely maternal education. The discussion of the regression results that follows will address the fact that this measurement equates two parents with no education and two parents with full education and the subsequent difficulty of interpretation.

  Paternal education is another important independent variable, as it seems likely that more educated fathers will allow their wives to take part in household decisions, including those about education. It is measured as a continuous variable with values ranging from 0 to 16.²

  Maternal income is measured as the income contributed to the household by the mother, measured in Pakistan Rupees. Notably, only nine percent of women in the study sample engage in paid work. This low incidence rate reduces the variance of the data which impacts the

² Sensitivity analysis was conducted using additional forms of measurement. These are discussed briefly in the results section.
statistical power of the model, but it is included as a means of testing the hypothesis that women with higher education can contribute more financial resources to the family and by doing so increase their ability to participate in the household decision-making process. To test this hypothesis, a model that includes mother’s income and excludes mother’s education will be included as Model 5.

Control Variables: Household Characteristics

- Total Monthly Expenditure per capita: This is an accepted measure of household income, as implemented by other studies using this data and household survey data in general. It is measured in Pakistan Rupees and all of the models in this paper use logged values in order to provide a relative, rather than an absolute, scale of comparison. It is expected that higher-income households will be more likely to involve the mother in the decision-making process, particularly as there would exist greater resources with which to send children to school.

- Household Size: A continuous variable measuring the total number of people living within the child’s household. In larger households, especially if this means greater numbers of children, women may have less control and would be less likely to have a voice in household decisions.

- District: The survey was conducted in 3 districts of Punjab. Faisalabad includes Pakistan’s second largest city with the same name, while Rahim Yar Kan is a more rural agricultural area. Pashtuns, or ethnic Afghans, inhabit the northern district Attock and maintain very conservative values. Cultural differences likely exist in these widely-varying districts and would influence household decisions, children’s educational attainment, or maternal
education levels. The baseline district is Rahim Yar Kan and two binary variables will be included to differentiate Attock and Faisalabad.

*Control Variables: Child Characteristics*

- **Total Monthly Educational Expenditures per Child:** A continuous variable measured in Pakistan Rupees. When educational expenditures are higher, the decision to send a child to school has a greater impact on the household, and may encourage weaker maternal involvement in this decision.

- **Female:** A binary variable in which male is equal to 0 and female is equal to 1. The mother will be more likely to be involved in decisions regarding the education of her female children.

- **Age:** A child’s age may impact the role of the parents in making decisions regarding their education. As children grow older, school enrollment may be more costly or rare and thus become a more important decision. Mothers are less likely to be involved in higher-stake decisions.

- **School type:** A child can be sent to a public or private school or a madrassa (an Islamic school attended by both males and females). Most children attend public school and this will constitute the baseline category. The decision of the type of school to send a child to follows the initial decision to actually enroll a child in primary school. A decision to send a child to a private school or a madrassa, for example, may bear greater importance than the decision to send a child to the nearest public school, and as such may influence the initial household decision-making process surrounding general enrollment.
Table 2: Descriptive Statistics for Control Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Monthly Expenditure per Capita (Pakistani Rupees)</td>
<td>920.47</td>
<td>1170.9</td>
<td>40.8</td>
<td>23573.9</td>
</tr>
<tr>
<td>Total Monthly Education Expenditure per Child (Pakistani Rupees)</td>
<td>130.8</td>
<td>330.5</td>
<td>0</td>
<td>12610</td>
</tr>
<tr>
<td>Household Size</td>
<td>8.7</td>
<td>3.8</td>
<td>2</td>
<td>40</td>
</tr>
<tr>
<td>Age (years)</td>
<td>9.9</td>
<td>2.94</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>Female (1=Female)</td>
<td>0.48</td>
<td>N/A</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>District: Attock (1=Attock)</td>
<td>0.31</td>
<td>N/A</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>District: Faisalabad (1=Faisalabad)</td>
<td>0.42</td>
<td>N/A</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Private School Attendance (1=Private School)</td>
<td>0.29</td>
<td>N/A</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Madrassa Attendance (1=Madrassa)</td>
<td>0.01</td>
<td>N/A</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

N=3,689  
N/A=Not applicable

Limitations

General concerns regarding the use of household survey data constrain this analysis. Missing data and misreported data are of particular concern. In this case, the large number of observations and the relatively low proportion of missing values allow the dataset to maintain its integrity. Further, extreme outliers were identified and dropped from the analysis as necessary.

Specific to this research question, one difficulty of the household survey is the potential bias of the respondent. The dataset used for this analysis does not include the identity of the
respondent or others present at the time of the survey, both of which might influence the validity of the answers. Further, respondents may be tempted to provide what they perceive to be the correct answer rather than the truth. This is of particular concern in regards to the information given about the household decision-making process (e.g. they may say that both parents make the decision when in fact one has more control), especially due to the subjective nature of the answer. This is an accepted limitation of this data, and it is useful to note that the percentage of women reported to have a role in the household decision-making process may be inflated.

The main independent variable of interest, maternal education, requires a more straightforward answer and is unlikely to suffer from misrepresentation problems. However, the variation in this variable is quite low as 70 percent of women have no formal education, which can complicate the ability of statistical models to identify strong relationships among the variables. As such, the estimate of the impact of maternal education is likely to represent a lower bound. It is also possible that because so few women have any education, the effects of one year of education might be stronger than they would in a country with higher education enrollment rates for females. The use of various definitions of maternal education in the regression models aims to address the limitation of low variation and provide as much information as possible from the household survey data.
Table 3: Probit Regression Results of the Effect of Maternal Education Levels on Maternal Involvement in Household Decisions Regarding Children's Primary School Enrollment

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1) Education in Years</th>
<th>(2) Any Education Binary</th>
<th>(3) Primary School Completion</th>
<th>(4) Education Differential</th>
<th>(5) Mother’s Income</th>
<th>One Unit Change (Pct. Point)¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal Education: Years</td>
<td>0.0343*** (0.0102)</td>
<td>0.191*** (0.0619)</td>
<td>0.220*** (0.0693)</td>
<td>-0.0319*** (0.00620)</td>
<td>0.747***</td>
<td></td>
</tr>
<tr>
<td>Maternal Education: Any</td>
<td>0.0313*** (0.00664)</td>
<td>-0.0307*** (0.00661)</td>
<td>-0.0298*** (0.00657)</td>
<td>-0.0255*** (0.00631)</td>
<td>4.077***</td>
<td></td>
</tr>
<tr>
<td>Maternal Education: Primary School</td>
<td>0.000252*** (8.59e-05)</td>
<td>0.000261*** (8.39e-05)</td>
<td>0.000260*** (8.51e-05)</td>
<td>0.000253*** (8.55e-05)</td>
<td>4.554***</td>
<td></td>
</tr>
<tr>
<td>Parental Education Differential</td>
<td>-0.0313*** (0.00664)</td>
<td>-0.0252*** (0.00661)</td>
<td>-0.0269*** (0.00657)</td>
<td>-0.0257*** (0.00631)</td>
<td>-0.72***</td>
<td></td>
</tr>
<tr>
<td>Paternal Education</td>
<td>-0.0313*** (0.00664)</td>
<td>-0.0252*** (0.00661)</td>
<td>-0.0269*** (0.00657)</td>
<td>-0.0257*** (0.00631)</td>
<td>-0.71***</td>
<td></td>
</tr>
<tr>
<td>Maternal Financial Contribution</td>
<td>0.000252*** (8.59e-05)</td>
<td>0.000261*** (8.39e-05)</td>
<td>0.000260*** (8.51e-05)</td>
<td>0.000253*** (8.55e-05)</td>
<td>2.922***</td>
<td></td>
</tr>
<tr>
<td>Household Characteristics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Monthly Expenditure per Capita</td>
<td>0.153*** (0.0450)</td>
<td>0.161*** (0.0449)</td>
<td>0.155*** (0.0449)</td>
<td>0.156*** (0.0446)</td>
<td>2.187***</td>
<td></td>
</tr>
<tr>
<td>Household Size</td>
<td>-0.0259*** (0.00742)</td>
<td>-0.0252*** (0.00740)</td>
<td>-0.0269*** (0.00741)</td>
<td>-0.0257*** (0.00743)</td>
<td>-0.58***</td>
<td></td>
</tr>
<tr>
<td>District: Attock</td>
<td>-0.761*** (0.0708)</td>
<td>-0.765*** (0.0707)</td>
<td>-0.767*** (0.0706)</td>
<td>-0.763*** (0.0701)</td>
<td>-19.5***</td>
<td></td>
</tr>
<tr>
<td>District: Faisalabad</td>
<td>0.133* (0.0732)</td>
<td>0.127* (0.0731)</td>
<td>0.130* (0.0733)</td>
<td>0.133* (0.0732)</td>
<td>2.917*</td>
<td></td>
</tr>
<tr>
<td>Child Characteristics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Monthly Educational Expenditure per Child</td>
<td>-0.0734** (0.0316)</td>
<td>-0.0709** (0.0314)</td>
<td>-0.0722** (0.0313)</td>
<td>-0.0722** (0.0312)</td>
<td>-1.759**</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>0.153*** (0.0528)</td>
<td>0.152*** (0.0527)</td>
<td>0.152*** (0.0527)</td>
<td>0.154*** (0.0527)</td>
<td>3.381***</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.000621 (0.0102)</td>
<td>-0.000361 (0.0102)</td>
<td>-0.000167 (0.0101)</td>
<td>0.000472 (0.0101)</td>
<td>-0.0138</td>
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<tr>
<td>Private School Attendance</td>
<td>-0.0716 (0.0645)</td>
<td>-0.0707 (0.0645)</td>
<td>-0.0685 (0.0644)</td>
<td>-0.0698 (0.0645)</td>
<td>-1.616</td>
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<tr>
<td>Madrassa Attendance</td>
<td>-0.457** (0.209)</td>
<td>-0.457** (0.209)</td>
<td>-0.463** (0.209)</td>
<td>-0.455** (0.209)</td>
<td>-12.56**</td>
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<tr>
<td>Constant</td>
<td>0.659** (0.301)</td>
<td>0.600** (0.300)</td>
<td>0.663** (0.301)</td>
<td>0.641** (0.300)</td>
<td>0.543*</td>
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<tr>
<td>Observations</td>
<td>3,698</td>
<td>3,698</td>
<td>3,698</td>
<td>3,698</td>
<td>3,804</td>
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</tr>
</tbody>
</table>

Robust standard errors in parentheses

* *** p<0.01, ** p<0.05, * p<0.1

¹One unit change based on Model 1 unless dependent variable of alternate model.
Results

Five different models are presented in Table 3 in order to determine the relationship between maternal education levels and the household decision-making process regarding children’s education enrollment. Models 1-4 test the impact of including four alternative measures of maternal education, all of which are highly statistically significant. Model 5 focuses only on maternal financial contribution to the household, regardless of her education, as an attempt to better understand competing causal mechanisms behind female empowerment in household decisions regarding education. As coefficients in probit models require further interpretation to become meaningful, the table also includes one column with calculated percentage point changes in the probability of mother’s participation in educational decision-making based on a one unit change in the independent variable. \(^3\) Aside from the various specifications of maternal education, these one unit changes are calculated from Model 1. The dependent variable for all models is mother’s decision-making role, operationalized as maternal participation in the decision-making process alone or in conjunction with her husband. \(^4\) All of the models include the same household and child characteristic control variables.

Maternal Education

Model 1 presents the effect of maternal education as measured by the number of years of school completed. A one year increase in maternal education raises the probability that she will participate in the household decision-making process by 0.75 percentage points, and this impact

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\(^3\) A one standard deviation change was used for variables with very small (irrelevant) units, which were: maternal financial contribution, total monthly expenditure per capita, total monthly educational expenditure per child.  
\(^4\) A model with a dependent variable of mother as the only decision-maker (i.e. not jointly with her husband) was tested, but did not provide any further information. The presentation of the results would distract from the information that the included models provide.
is highly statistically significant (p<.001). This result is particularly interesting in light of the low variation in maternal education levels. Descriptive statistics reveal that 70 percent of mothers have zero years of education. As such, the 30 percent of mothers with some level of education are driving this result, and may explain its small substantive significance.

Models 2 and 3 contribute to a deeper understanding of the role of maternal education levels. As demonstrated in Model 2, if a mother has received any education at all, this increases the likelihood that she will participate in the household decision-making process by 4.1 percentage points compared to those with no education. While this operationalization measures education as a solitary event, rather than a gradual process that improves outcomes year by year, one can imagine certain educational thresholds that would particularly propel female empowerment. The receipt of any education at all would be one such threshold, and this model demonstrates that its effects are statistically and substantively significant. Model 3 sheds light on the effect of primary school completion, another potential threshold level, on household decision-making regarding children’s education. This model indicates that achieving this basic level of education will increase the probability of maternal participation in the household educational decision-making process by 4.6 percentage points above those who do not complete primary school. Primary school completion requires 5 years of education, but the contribution of this level of educational achievement is greater than the value of the impact of an individual year multiplied by five.

In all three models, paternal education level (measured in years) produces an interesting relationship. A one year increase in paternal education decreases the probability that the mother will participate in the household decision-making process regarding children’s education in
every model. The decrease of 0.71 percentage points in Model 1 is highly statistically significant (p<.001). This is a surprising result, as one would expect parental education levels generally to move in the same direction. Descriptive statistics reveal that for approximately 7.3 percent of parents, the mother has more education than the father. The education levels are the same for 41.7 percent of parents, and for the vast majority of these cases (81 percent), neither parent has any education. As the father’s level of education increases, the likelihood that the mother has no education grows. In other words, a father with 3 years of education is more likely to have a wife with some amount of education than a father with 10 years. This is a fascinating finding and one that deserves further study. In the context of this regression, the growth in the education differential as men paternal education increases helps to explain the negative coefficient on paternal education. If higher levels of paternal education correspond with lower levels of maternal education, and maternal education positively impacts the likelihood of maternal involvement in the household decision-making process, then increases in paternal education should negatively affect this likelihood.

Model 4 contributes to further exploration of this relationship between paternal and maternal education. It might be the case that a mother’s actual education level may be less important than her level of education in relation to the father’s level. The education differential variable in Model 4 replaces both the maternal and paternal education variables. Levels of the education differential display high levels of correlation with paternal education and the effect of a one unit increase is also very similar, as a 1 year increase in the education differential lowers

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5 This weakens the legitimacy of the previously mentioned concern that the education differential variable in Model 4 equates two parents without education and two parents with high levels of education. While still valid, the particular trends in parental education that the inclusion of this variable highlights are instructive. However, this limitation should receive consideration in interpretation of any results using the education differential variable.
the probability of a mother’s role in the household decision-making process by 0.72 percentage points. As noted above, the education differential values are actually quite similar to those of father’s education, as 70 percent of women have zero years of education. Greater variation in mother’s education levels might provide more meaningful results for this specification, but the low numbers of educated females and the trend of higher education differentials at higher levels of father’s education elicited by these measurements do provide a useful context in which to place other results.

Mother’s Income

Model 5 tests the hypothesis that the increased capacity of educated women to contribute to household income is the main mechanism to increase a woman’s role in household decision-making processes. It is worth noting that as expected, maternal education and maternal income are positively correlated. Maternal contribution to household income is included in all three of the probit models and is highly statistically significant. The magnitude of the effect is also significant, as a one standard deviation increase in a woman’s financial contributions raises the likelihood of participation in the household decision-making process by nearly 3 percentage points.

Maternal contribution to household income is included in Model 5 as the main independent variable of interest, replacing maternal education levels in an effort to isolate the causal process. The variable continues to have a significant substantive impact in this model, increasing maternal participation in household decisions by 3.2 percentage points. Maternal contribution to household income clearly plays an important role, though the positive effect of a change in mother’s income does not exceed the effect of a mother with any education or one who
has completed primary school. However, it should be noted that primary school completion is a one-time event, whereas several increases in maternal contribution to household income are plausible across a lifetime.

**Control Variables**

The variables reflecting the three different districts of Punjab involved in this dataset contribute meaningful results that are statistically significant at conventional levels. Compared to the baseline district Rahim Yar Khan, households in Attock are much less likely to involve women in the household decision-making process, while households in Faisalabad are more likely to do so. More specifically, compared to Rahim Yar Khan, living in Attock lowers the likelihood of maternal participation by 19.5 percentage points. Residence in Faisalabad increases the likelihood of maternal participation by 2.9 percentage points compared to Rahim Yar Khan, and 22.4 percentage points compared to Attock. As noted in the LEAPS Report (2007), Rahim Yar Khan is much poorer than the other two districts. Hence the comparatively strong negative effect in the wealthier Attock district is somewhat surprising.

Information on adult educational attainment levels and consideration of cultural characteristics in the three districts further clarify the results. The LEAPS Report (2007) states that while Rahim Yar Khan demonstrates the lowest educational achievement levels for adult males, Attock demonstrates the lowest levels for adult females. As the second largest city in the country and only two hours from Lahore, Faisalabad unsurprisingly showcases the highest levels of both female and male educational achievement. The probit regression results follow these educational achievement levels, as mothers who live in Attock are least likely to participate in the household decision-making process, surpassed by Rahim Yar Khan and then Faisalabad. The
conservative culture of the Pashtun people in Attock most likely drives this effect, and strongly
trumps the effects of wealth as noted above. The widely varying impact of each district points to
the fact that social and cultural context play a strong role in the household decision-making
process. However, maternal education levels also play a role when district location remains
constant, indicating that it can be an effective mechanism of social change.

Several other control variables for both households and children demonstrate a
statistically significant impact on the likelihood of a mother’s participation in the household
decision-making process. Higher-income households, as measured by higher expenditures per
capita, are more likely to have mothers involved in the decision-making process regarding
children’s education, raising the probability by 2.2 percentage points. Similarly, mothers are less
likely to be involved in the decision-making process in larger households, though the 0.58
percentage point magnitude is much less than that of household wealth. Mothers are also less
likely to participate in the decision-making process for children with higher monthly educational
expenditures. In reference to women’s empowerment, the result that women have a lower
likelihood of participation in “higher-stakes” decisions may not be surprising.

Additional variables measuring the characteristics of the child reveal that a mother’s
likelihood of involvement in the decision-making process regarding education increases by 3.4
percentage points for female children. Compared to public school attendance, attendance at a
madrassa significantly lowers the likelihood that mothers will participate in the educational
enrollment decision within the household. More specifically, attendance at a madrassa lowers
the likelihood that a mother will participate in the decision-making process by 12.6 percentage
points compared to public schools. This is a particularly surprising finding given the very small
number of children attending madrassas (55 children), and one that will require further research. One possible explanation of this result rests on the fact that madrassas are free to attend. As such, the decision to enroll children in school (public or private) would impose great costs on the family, and consequently, may not be one in which the mother is likely to participate.

**Policy Implications and Conclusion**

The results of all of the models indicate that a mother’s income raises the likelihood that she will participate in household decision-making regarding education. It also affirms that maternal education levels have an additional effect on household decision-making processes regardless of the income contributions that higher education levels may allow. These results reflect favorably on the current educational policies and goals in place throughout the world that emphasize the education of females. It provides a more sophisticated understanding of the benefits to educating women, as it sheds lights on the causal mechanism by which a mother’s education impacts the educational enrollment of her children. Higher levels of maternal education increase the likelihood that the mother will participate in household decision-making processes regarding the educational enrollment of her children, and educated mothers will advocate for the education of their children.

Further analysis suggests that a higher likelihood of female participation in the decision-making process is not merely a result of greater income contribution, although this certainly does display a significant effect. While the substantive impact of maternal education is not overwhelming in any of the models, it consistently contributes a positive effect on the likelihood of her participation in household educational decisions. Maternal education has an effect despite an environment that produces low rates of female education in the Attock district and apart from
any maternal financial contributions. The value of education merits policy action and can continue to serve as an important agent of change in Pakistan, where many women lack any education and gender equity has much room to improve. While female empowerment levels may be greater in other areas of the developing world, areas of egregious inequity still exist and benefits await countries that narrow any existing gap. As such, there remains a continued need for an emphasis on education for women specifically as a necessary complement to policies that advocate increased education for all.

This analysis also emphasizes another important policy consideration. The additional specifications of maternal education in Models 2 and 3 underscore the significant role that even small amounts of education can play. The role of quality of education is unknown in these models and with no intention of distracting from critical goals surrounding secondary school and the establishment of quality education throughout the world, the data seem to suggest that significant value lies in any amount of education for a girl. Amidst efforts to improve education quality, the focus on educational access should remain. The negative relationship of the parental education differential with the mother’s role in the educational decision-making process further emphasizes this point. And as much of the bias in education through the world leans toward men, education policy should continue to focus on the facilitation of female enrollment and completion rates. Specific policies might focus on community awareness and outreach programs, particularly targeted toward men (fathers), that emphasize the widespread benefits of education and showcase the resources available in the community.

This paper contributes to a long line of research regarding the impact of a woman’s education on her own life, the life of her children, and the overall household. While it further
nuances the understanding of the beneficial results of female education policies, it also points to several areas for additional research. A comparison of the impact on household decision-making for programs provide job or trade training rather than the formal education levels included here and the effect of an increased maternal role in decisions regarding children’s education on other areas of household decision-making and female empowerment constitute two potential research questions. Further research will provide context for the results of this study and increase the effectiveness of policies that aim to increase female empowerment in the developing world.

The improvement of female enrollment and completion rates throughout the world constitutes an essential first step. In addition to other well-documented benefits, educated mothers are more likely to send their children to school, particularly their daughters. Increases in maternal participation in household decisions regarding children’s education will promote a virtuous cycle of education and empowerment that will produce rich dividends for years to come.
References


