

# Educating Our Mothers: Exploring the Link between Maternal Education and Child Outcomes

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Maternal education levels are consistently found to be strongly correlated with child's educational achievement. Children's learning outcomes as well as time allocated to educational activities outside school, both have shown a positive linkage with the number of years of mother's schooling. Given this association, maternal education figures revealed by ASER 2013 are quite worrying. Seventy two percent of all the mothers surveyed in rural Pakistan have never been to school and the average number of years of schooling for those who have been to school is 2.8 years. These statistics have important implications for the future of children growing up in Pakistan.

Many studies show a considerable impact of an additional year of maternal schooling on child's learning outcomes. Children's performance on a standardized math test improved notably when mother's education increased by 1 year, the effect being largest for girls aged 7-8<sup>2</sup>. Children's test scores in English and Urdu and time spent on educational activities inside home also showed a strong correlation with mother's schooling<sup>3</sup>. Findings of Magnuson & Shager (2008)<sup>4</sup>, which are disaggregated along socio-economic lines, suggest that children of advantaged mothers with lower levels of education appear to have improved reading skills when their mothers' education improves. Moreover, mother's education is also found to have a positive correlation with children's readiness to attend school. Behrman and Rosenweig (2002) found that 1 year of maternal schooling increased children's years of education by 13%<sup>5</sup>. Another study suggests that mothers' participation in adult basic education improved children's school readiness even when mothers' earnings did not increase<sup>6</sup>.

<sup>1</sup> See Moore and Schmidt, 2004, Furstenberg, Brooks-Gunn and Morgan, 1987, Behrman and Rosenweig 2002, Carnerio, Meghir and Parey, 2011, Andrabi, Das and Khwaja, 2009, Chevalier, Harmon, O'Sullivan, and Walker, 2005

<sup>2</sup> Carneiro, P., Meghir, C., & Parey, M. P. (2011). Maternal Education, Home Environments and the Development of Children and Adolescents. *Journal of the European Economic Association*, Volume 11, 123-160.

<sup>3</sup> Andrabi, T., Das, J., & Khwaja, A. (2009). What Did You Do All Day? Maternal Education and Child Outcomes. *Policy Research Working Paper 5143*, The World Bank, Development Research Group.

<sup>4</sup> Magnuson, K., & Shager, H. (2008). The Effects of Increased Maternal Education on Children's Academic Outcomes: Evidence from ECLS-K. *University of Wisconsin-Madison*.

<sup>5</sup> Behrman, J., & Rosenweig, M. (2002). Does Increasing Women's Schooling Raise the Schooling of the Next Generation? *American Economic Review*, Volume 92, Number 1, 323-334.

<sup>6</sup> Magnuson, K. (2003). The effect of increases in welfare mothers' education on their young children's academic and behavioral outcomes. *University of*

This intergenerational transmission of education works through various mechanisms. An educated mother will have high expectations for her children's educational success and will encourage them to develop high expectations of their own<sup>7</sup>. She will spend more direct time with the children on their school work and facilitate learning for them by employing other members of the household in reading to them or helping them with their school work<sup>8</sup>. An educated mother is also more likely to have health knowledge and adopt better healthcare practices<sup>9</sup>. This will ensure that the children are healthy and attend school regularly. Another pathway which is much talked about by the researchers is the household income- an educated mother is more likely to participate in the labor market which will in turn increase the household income and make the home environment favorable for learning.

These aforementioned studies<sup>10</sup> have typically focused on countries with high levels of female education and have mostly sought to study the impact of mother's additional secondary schooling or college education. Such studies are sparse in the third world countries where average level of maternal schooling does not exceed primary level, hence restricting the marginal impact that can be studied. With this year's ASER data, we set out to find whether this association holds in the context of Pakistan where female education levels are abysmally low. Looking at data from 138 rural districts/agencies, we study whether the impact of maternal education on child's achievement is significant at very low maternal education levels, whereby the average number of years of maternal schooling is 2.8 years.

This note undertakes a regression analysis to estimate the impact of an additional year of mother's schooling on the learning outcomes of children in English, Language<sup>11</sup>, and Arithmetic, disaggregated by gender. Controlling for the father's years of education, probability of the child taking tuition, child's age and wealth<sup>12</sup> of the household, the

<sup>7</sup> Davis-Kean, P. E. (2005). The influence of parent education and family income on child achievement: the indirect role of parental expectations and the home environment. *Journal of Family Psychology*

<sup>8</sup> Andrabi, Das, & Khwaja, 2009

<sup>9</sup> Aslam, M., & Kingdon, G. (2012). Parental Education and Child Health - Understanding the Pathways of Impact in Pakistan. *World Development*.

<sup>10</sup> With the exception of Andrabi, Das and Khwaja, 2009

<sup>11</sup> Language means Urdu/Pushto/Sindhi

<sup>12</sup> Wealth of the household has been estimated by constructing a composite wealth index by incorporating indicators such as the type of house (semi pucca

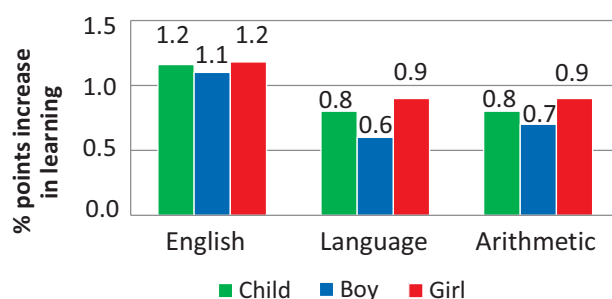
note uses a probit regression model to study the effect mother's schooling has on the learning outcomes of children. Table 1 shows the dependent variables used in the analysis of each subject. This note does not take into account the effect of assortative mating which can be one channel through which maternal education affects child's education. Moreover, mother's access and ability have not been controlled for because of the lack of data on these indicators. This remains a potential area for further research.

Table 1 : Dependent Variables	
<b>English Level</b>	This variable is a dummy variable equaling 1 for children whose competency level in English, according to ASER assessment, is at least 'Word' and at most 'Sentence' level. Children whose competency level is Beginner, Small Letters or Capital Letters are assigned a value of 0
<b>Language</b>	This variable is a dummy variable equaling 1 for children whose competency level in Language, according to ASER assessment, is at least 'Sentence' and at most 'Story' level. Children whose competency level is Beginner, Letters and Words are assigned a value of 0
<b>Arithmetic</b>	This variable is a dummy variable equaling 1 for children whose competency level in Arithmetic, according to ASER assessment, is at least 'Subtraction' level and at most 'Division' level. Children whose competency level is Beginner and Number Recognition (0-9, and 10-99) are assigned a value of 0

Preliminary analysis on the ASER 2013 data shows that an additional year of mother's schooling<sup>13</sup> increases the probability of a child attaining advanced learning outcomes in English, Arithmetic and Language. As can be seen in Figure 1 which presents findings disaggregated by gender, an additional year of mother's schooling increases the probability of being able to read English words and sentences by 1.18 percentage points for girls and 1.12 percentage points for boys. This difference between the effects on both genders is significant<sup>14</sup>. For language, a one year increase in mother's education increases the probability of child being able to read a sentence or story

in Urdu/Sindhi/Pashto by 0.9 percentage points for girls and 0.6 percentage points for boys, though this difference is not very significant<sup>15</sup>. The impact of mother's additional schooling year on the probability of child being able to perform subtraction or division is 0.7 percentage points for boys and 0.9 percentage points for girls but as was the case with language, this difference is not very significant. These results show that for each additional year of schooling of the mother, the probability of performing better is higher for girls.

**Figure 1: Impact of a One Year Increase in Mother's Schooling Years on the Learning Levels of Children**



Interestingly, the highest marginal impact on the probability of child achievement is yielded by the primary level years of maternal schooling<sup>16</sup>. Sadly, only around 7.7% of the mothers in our sample had completed primary schooling. Figure 2, which presents findings disaggregated by gender, shows that the impact of an additional year of schooling for mothers who have attained at least primary level on the probability of a child attaining advanced learning outcomes is 6.3 percentage points for English, 3.9 percentage points for Arithmetic, and 7.1 percentage points for Language<sup>17</sup>. For English, this probability of attaining advanced learning outcomes is higher for girls, at 8.8 percentage points compared to only 4.8 percentage points for boys, a difference which is significant. For Language, the effect is 8.2 percentage points for girls and 6.2 percentage points for boys but since the difference between these two is insignificant<sup>18</sup>, the effects are not very different from each other. In Arithmetic, an additional year of mother's schooling yields a 2.8 percentage point increase in the advanced arithmetic capabilities of a boy, but this effect is not significant. A

<sup>13</sup> The independent variable here for mother's schooling is a continuous one with values ranging from 0 years of education to 20 years of education

<sup>14</sup> Wald test yielded significant results

<sup>15</sup> Wald test yielded insignificant results

<sup>16</sup> The independent variables used for mother's schooling here represent different levels of education e.g. primary level

<sup>17</sup> All these are significant, even at 1% confidence level.

<sup>18</sup> According to a Wald test

highly significant impact exists for girls at 7.2 percentage points. It is important to note here that maternal education up till primary level has a greater impact on the probability of girls' achievement in school than the boys'.

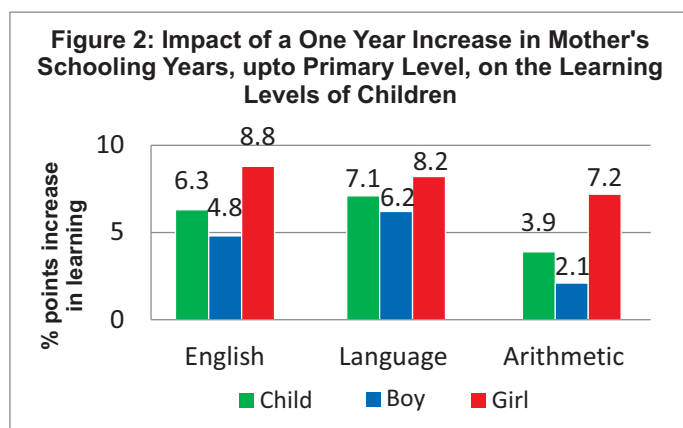


Table 2 shows the impact of a one year increase in mother's schooling on the probability of children attaining improved learning outcomes when maternal education is divided into primary and post-primary levels. What is interesting about these findings is that for Arithmetic and Language, those mothers who have completed primary learning and those who have attained more than primary education have similar impacts on the probability of girls attaining advanced learning scores. For example, the probability of a girl whose mother has attained primary schooling clearing the "Sentence" or "Story" level is 8.2 percentage points which is not significantly different than a girl whose mother has attained a level greater than primary. For English, the probability of a girl attaining outcomes is higher for mothers who have acquired more than 5 years of schooling. However, it is important to add here that even in English the probability of a girl performing better is higher than the probability of a boy, at both primary and greater than primary levels of education of the mother.

**Table 2: The Impact of a 1 Year Increase in Mother's Schooling on the Probability of Children Attaining Advanced Learning Outcomes**

	Educational Level of Mothers	English (Percentage Points)		Language (Percentage Points)		Arithmetic (Percentage Points)	
		Girls	Boys	Girls	Boys	Girls	Boys
1.	Primary Level	8.78	4.68	8.19	6.16	7.22	5.59*
2.	Post Primary Level	11.78	10.44	8.91	5.49	7.78	16.19

\*Insignificant

The above mentioned statistics show that according to ASER 2013 estimates, concrete evidence exists for the view that mother's education has a strong bearing on children's academic achievement, especially on the educational attainment of girls. Moreover, the impact on children's learning outcomes is huge when mothers have completed at least primary schooling. The most important finding of this note is that even low levels of maternal education have a considerable impact on the learning levels of children, especially female children.

These findings have important policy implications for rural Pakistan. Investment could be made in some form of adult basic education improvement drive which targets to-be mothers and brings them at par with primary schooling level. The average years of schooling of a mother, and consequently, the learning outcomes of her children, could also be improved if some form of strings attached intervention could be put into place which makes it mandatory for women to attend school to avail the benefits of a particular social security/welfare program. For example, if the women beneficiaries of the Benazir Income Support Program are asked to take basic education courses in order for them to be eligible for the program, the average years of schooling for mothers could improve to a great extent.

It is important that while assessing what the children are learning at school and striving to improve it, we also look at the drivers of learning at home. And in this regard the importance of mother's attitude towards children's achievement at school cannot be overlooked. Even a few years of schooling can help the mother to realize that in order to succeed at school, her child needs to put in a certain level of effort. She will be clearer on the steps needed for academic achievement. It is time that we realize how important this association between maternal education and probability of child's achievement is and consider introducing basic literacy programs for women which capitalize on this relationship.