Research paper

# Women's participation in household decisions and gender equality in children's education: Evidence from rural households in Pakistan

Sundus Saleemi [a,*], Chiara Kofol [a]

[a] Centre for Development Research (ZEF), University of Bonn, Germany

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ABSTRACT

In this study we test if households where women participate in decisions regarding children's education incur more equal expenditures on education of boys and girls. To this end, we estimate changes in households' share of education expenditures spent on girls due to changes in women's participation in household decisions. Moreover, we test the effect of changes in women's awareness of gender equality (AGE) on these shares. These effects are estimated with a Fixed Effects Model (FEM) using three rounds of longitudinal data of rural households in Pakistan. Our results show that households with children of both genders of the secondary school-age (11–16), where women participate in decisions, spend higher shares of education expenditures on girls. These shares are as much as sixty percent higher than those of the average household. Furthermore, to tackle selection of households into sending children to school, we estimate a Heckman Selection Model. The dependent variable of the Heckman Selection Model is the share of household total education expenditure spent on an individual child. Our results show that girls in households where women participate in decisions and with AGE are more likely to receive a share of expenditure 12.6 percentage points higher than boys. Also, the combination of AGE and women's participation in household decisions is also highly correlated with the share of secondary education expenditure for girls when distance to school is not long. By using the shares instead of actual expenditures, we show factors that correlate with gender equality. The paper provides evidence of effectiveness of women's decision participation in reducing gender inequality, a dimension of empowerment hitherto less explored in literature.

## 1. Introduction

If women were able to take more intra-household decisions, would they take decisions aimed to reduce observed gender inequality? Reducing gender inequality is one of the Sustainable Development Goals (SDGs), which states that women and girls, everywhere, must have equal rights and opportunity and gender equality is an important dimension of inclusive and sustainable development[1]. The analysis is of salience in the Pakistani context as girls in rural Pakistan are severely disadvantaged in terms of access to education and wide disparities exist in the education outcomes of girls and boys (Khan, 1997; Arif, Saqib & Zahid, 1999; Aslam & Kingdon, 2008; Khan, 2008).

This paper contributes to the scarce literature studying the effect of women's participation in household decisions on gender equality and empirically testing the effect of women's awareness of gender equality (AGE) on the reduction of inequality in education expenditures. The current literature suggests that improving women's access to tangible and intangible resources allowing meaningful choice increases their ability to take decisions (Alkire, Meinzen-Dick, Peterman, Quisuimbing, Seymour & Vaz, 2013, Samman & Santos, 2009; Ibrahim & Alkire, 2007), ultimately empowering them (Upadhyay et al, 2014; Prata et al, 2017; Pratley, 2016). Women empowerment has been found to improve children's outcomes such as infant mortality and health and nutrition (Branisa, Klasen & Ziegler 2013; Rendall, 2013) but some studies suggest that women's decisions typically favour boys (Malapit & Quisimbing, 2015) and do not contribute to achieve gender equality.

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In this paper, we analyse the gendered effects of women's participation in household decisions on children's education by assessing the effect of their participation in decisions on the shares of household education expenditures spent on girls. Moreover, we analyse the importance AGE testing it as a mechanism to improve gender equality when women are allowed to take intra-household decisions. Women's decision participation has also been criticized as a measure of women's empowerment[2] as women who have been discriminated could in turn discriminate against or not favour other girls and women in their decisions (Vaz, Pratley, & Alkire, 2016; O'Hara & Clement, 2018) not actively reducing gender inequalities (Sardenberg, 2016; O'Hara & Clement, 2018). AGE may reduce the bias in the gender-unequal attitude towards other women (Rowlands, 1995; Sen and Batliwala, 2000; Mosedale, 2005; Batliwala, 2007; Beşpınar, 2010; Sardenberg, 2016). We hypothesize that those women who have AGE are more likely to use their decision participation for reduction gender inequality.

We test the hypothesis that AGE matters to reduce gender inequality when women are involved in intra-household decision making by assessing its effect on women's participation in household decisions on the share of education expenditures spent on children in the household and exploring their heterogeneity across gender. Such an analysis can reveal if women's participation in decisions in a first place and its combination with AGE in a second place, reduces observed gender inequalities. The dimension of inequality analysed in this paper (the share of household expenditures on girls' education compared to boys) was chosen as in Pakistan girls are not only disadvantaged in terms of school enrolment, (Khan, 2008) but are also likely to receive lower expenditures on their schooling than boys (Aslam & Kingdon, 2008). The data used in our current study corroborates this observation[3].

The paper analyses data from the Pakistan Rural Household Panel Survey (IFPRI & IDS, 2012:14), a longitudinal household survey data of rural households in Pakistan. The PRHPS allows us to construct indicators of women's decision participation in household as well as their AGE. We know that unobserved heterogeneity could bias our results as gender equal expenditure may not be the result of women's participation in household decisions or of AGE but other factors, such as household income or unobserved differences between households. To deal with this possible source of bias, we estimate a fixed effects model for panel data. We exploit the longitudinal dataset introducing fixed effects in the model reducing the bias due to the unobserved heterogeneity of households which is fixed over time (e.g. due to family's background) and we control for several covariates which might affect women's participation in household decisions over time. Additionally, we estimate a Heckman Selection model which controls for self-selection of households into sending girls to school on the base of unobservable factors. The results suggest that the variables used for the selecting equation in Heckman Selection model meet the exclusion restriction. We analyse changes in girls' share of household education expenditures due to such changes in women's participation in decisions. A key contribution of our paper is to assess the effects of women's decision participation and AGE not the share of household expenditure spent on girls instead of the magnitude of the overall expenditure. By using theses shares, we are able to estimate the effects on gendered distribution of resources. Moreover, we can also control for factors such as differences in household wealth or income levels that may affect the overall household expenditures but not necessarily the gendered distribution of these expenditures.

The results of fixed effects model suggest that in households where women participate in decisions regarding children's education, the share of the household's expenditure spent on girls in secondary school is significantly higher than the shares spent by the average household, contributing to reduced intra-household gender inequality. Our estimates suggest that these shares are as much as up to 60 percent higher than those spent by the average household. Antman (2011) finds a similar effect of women's participation in household decisions on the share of household clothing expenditures spent on girls, however, she did not directly measure women's participation in household decisions, but she considered the absence of men from the household due to migration for work a potential factor behind changes in women's decision participation. The results from our Heckman Selection Model corroborate the effects captured by the fixed effects model; girls of the secondary school age living in households where women participate in decisions receive significantly higher shares of the household education expenditure.

The main limitation of the study is that the Heckman Selection Model is based on pooled data[4] controlling for village and year fixed effects but not for individual fixed effects, thus it does not fully account for individual heterogeneity across the sample. However, the paper makes an important contribution to the body of research on women's empowerment and their participation in household decisions in achieving gender equality. The rest of this paper is structured as below: Section 2 summarizes relevant literature, Section 3 describes the data and methods, Section 4 discusses the result, Section 5 provides a robustness check and Section 6 concludes.

## 2. Literature review

Research on schooling and education of girls in Pakistan reports wide disparities between education of girls and boys (Khan, 1997; Arif, et al., 1999; Aslam & Kingdon, 2008; Khan, 2008). There are both supply side and demand side constraints to girls' education. On the supply side, low public investment in education infrastructure has led to unavailability of schools; a factor behind low levels of schooling (Khan, 1997). On the demand side, poverty and lack of financial resources limit children's schooling and education (Arif, et al., 1999).

Girls are disadvantaged at various levels of education. They are less likely to be enrolled in school (Khan, 2008), compared to boys, households spend less on their education (Aslam & Kingdon, 2008) and girls are more likely to attend lower quality schools than boys if enrolled (Aslam, 2009). These disadvantages are more pronounced in the rural areas of Pakistan compared to the urban areas (Arif, et al., 1999). The adverse effects of factors limiting children's schooling, like poverty and low levels of parental education, are of higher magnitudes for girls than boys. While factors that increase children's schooling and education have a smaller effect on girls' schooling than that on the schooling of boys (Arif, et al., 1999; Khan, 2008). With the exception of Hou (2016), this body of research has not analysed the effect of women's participation in household decisions on girls' schooling.

Index indicators of women's empowerment based on women's role in household decisions popularized after the inclusion of decision-making modules in the Demographic and Health Surveys (DHS) (Kishor & Subaiya, 2008). These modules capture women's control over their own lives and women's choices, closely in line with the dominant conceptualization of empowerment (Ibrahim and Alkire, 2007; Alkire et al, 2013; Mahmud & Tasneem, 2014; Ahmad & Khan, 2016; Phan, 2016). Conceptually, women's empowerment is considered as a change

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[2] Also see Gram, L., Morrison, J., & Skordis-Worrall, J. (2019). Organising concepts of 'women's empowerment' for measurement: a typology. *Social indicators research*, *143*(3), 1349–1376.

[3] There are other critiques of women's participation in household decisions as an indicator of empowerment. It is, for example, argued that decision making within households is a complex process not adequately captured through structured surveys (Seymour & Peterman, 2018; Agarwal, 1997). In this paper, we consider household decisionmakers identified using structured surveys as a reasonable approximation of the reality.

[4] The Heckman selection model cannot be run with individual fixed effects, so the data were pooled and we controlled for village and year fixed effects instead.

in women's situation from limited/no life choices to having more choices in life (Kabeer, 1994; 2005). Empirically, when women are observed taking small and large decisions regarding their life or within the household, it is assumed to be indicative of women's choice and control over life and hence a component of empowerment (Wilson, 2008). Indicators based on women's participation in household decisions have been used to identify covariates of women's empowerment (Sathar and Kazi, 2000; Kishor & Gupta 2004; Garikipati, 2008; Afzal et al., 2009; Khan, Mann, Zafar, Hashmi, & Akhtar, 2010; Mahmud, Shah & Becker, 2012; Weber & Ahmad, 2014) and to assess the impact of women's empowerment on outcomes such as fertility and child health (Upadhyay et al., 2014; Pratley, 2016; Prata et al., 2017). These indicators better reflect women's empowerment than indirect measures such as level of education or formal employment. Indirect measures do not allow researchers to separate the causes of empowerment from its outcomes (see Branisa, Klasen & Ziegler, 2013; Ferrant, & Tuccio, 2015; Sundström, Paxton, Wang, & Lindberg, 2017 for indirect measures and Cueva Beteta, 2006; Schüler, 2006 for critique).

A growing literature applies models to study household decision-making in different contexts, such as the allocation of resources to children, labour supply, and fertility decisions (e.g. Duflo, 2012; Ashraf, 2009; Almås, et al., 2018) and finds that when women decide more money is spent on the children in general (see Duflo, 2012; Almås, et al., 2018, among others). A number of empirical studies have assessed the effects of women's empowerment on outcomes such as children's health, nutrition, and education. Studies have found positive effects of women's participation in decisions on children's outcomes, however, the effect of women's participation on gendered distribution of resources of household resources or gendered outcomes have been studied less.

Some literature on the gendered effects of women's empowerment and their decision participation has found positive impacts. Afridi (2010) uses an index indicator of women's empowerment and assess the effects on gaps in children's schooling in India. The paper concludes that there is a significant positive effect of women's empowerment in the reduction of gaps between education of girls and boys. Luz & Agadjanian (2015) suggest women's preference towards girls when in charge of decisions who find a positive association between women's decision participation in home and girls' school enrolment. They do not find a significant association of women's decision participation with boys' enrolment suggesting that women's participation is of salience for the education of girls. Roushdy (2004) finds a similar association in the Egyptian context, a positive association is found between women's decision making and girls' school completion rates. Hou (2016) using the Pakistan Social and Living Standards Measurement Survey (PSLM) finds strong positive association of women's decision-making role and girls' school enrolment in Pakistan.

However, there is also evidence of women's preference towards boys. Quisumbing, & Maluccio, (2003) report evidence of mothers' preferential treatment of sons in contexts diverse as Indonesia and South Africa. The paper has estimated the effect of fathers' and mothers' assets on children's schooling. For Bangladesh, a socio-cultural context similar to Pakistan, they do not find different effect of fathers' and mothers' assets on the schooling of boys and girls. In rural Pakistan, Mansuri (2006) analysed education outcomes of boys and girls comparing households with male head of the household with those with female head of the household and found significantly negative effects on schooling outcomes of girls in households with women as head of the household.

As women's role in household decisions does not unambiguously reduces gender gaps, O'Hara and Clement (2018) include indicators of women's consciousness in women's empowerment valuations (O'Hara & Clement, 2018). The authors have not explored the effect of women's consciousness on intra-household gendered distribution of resources but emphasizes the importance of analysing gender gaps within the household in empowerment valuations.

As a result, there is limited empirical evidence that women's empowerment, measured as women's participation in household decisions, reduces gender inequalities. We seek to fill this gap in this study.

## 3. Data and methods

### 3.1. Data

The analysis in this paper is based on three rounds (round 2, round 3 and round 4) of the Pakistan Rural Household Panel Survey (PRHPS) (IFPRI and IDS, 2016; IFPRI and IDS, 2014, IFPRI and IDS, 2017). Round 4 was carried out by one of the authors for only a sub-set of the panel. The PRHPS is a longitudinal dataset of rural households from three provinces of Pakistan: Punjab, Sindh and eleven districts of Khyber Pakhtunkhwa[5,6]. Round 4 was conducted in two districts of Khyber Pakhtunkhwa (KPK) Province; Districts Mansehra and Nowshera and, in District Attock of province of Punjab. In the first round (2012), total 2124 households were sampled[7] and complete data was collected from 2056 (96.8 percent) households. In the second round (2013), out of the 2090 households visited for the re-survey, 93 percent households provided complete data. In the third round (2014), out of the 2019 households visited, 1876 (93 percent) provided complete information. In round 4 (2017), 315 households in three districts were revisited, data was collected from 292 households (93 percent); 14 (4.4 percent) households had moved or migrated, 5 households (1.6 percent) refused to provide data. Analysis of attrition between rounds suggests that the likelihood of dropping out of the survey is not correlated with the dependent or the explanatory variables of this paper. There is, therefore, low risk of bias in estimates due to sample attrition (Saleemi, 2020). The PRHPS has a wide coverage, representing 15 million rural households although it is not nationally representative due to the exclusion from the sampling universe areas with adverse security conditions (Nazli & Haider, 2012). The number of rural households in the country according to the national census was 20 million in the year 2017 (GOP, 2017).

Data was gathered from at least one woman and one man from each household using two questionnaires. These respondents were households' self-reported head of the household and the spouse of the head of the household. In majority households, a man was the head. Households that did not have an adult man (woman) available for interview, sections of the male (female) questionnaire were filled by interviewing the woman (man) respondent, these sections are called supplementary questionnaire. Data on women's participation in household decisions is not available in round of the PRHPS, therefore in the analysis below, we use rounds 2, 3 and 4.

The first dependent variable used in the analysis is the share of households' schooling expenditure spent on girls. The share of household expenditure on girls (henceforth girls share) is households' expenditure on school fee, books and stationery and school uniform per girl divided by the per child expenditure on these three categories[8]. The per child and per girl expenditures are used to adjust the shares for the number of boys and girls. The analysis is for children in two age groups, children of primary school age (ages 5–10) and children of secondary school age (ages 11–16); ages 5–10 correspond to primary years of

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[5] The fourth province, Province of Baluchistan, districts in KPK and areas previously known FATA and FANA were not included in the survey due to adverse security situation in these areas. Pakistan administered Kashmir and Gilgit Baltistan were also excluded from the survey.

[6] Punjab, Sindh and Khyber Pakhtunkhwa are the first, second and third most populous province of the country respectively. The excluded province of Baluchistan has the smallest population in the four provinces of Pakistan. The province of Baluchistan also fares worst in terms of social indicators particularly that of women's education.

[7] The analysis in this paper does not use first round of the panel as this round does not report decision making within the household. Decision making modules were added to the survey from second round, PRHPS (2013).

[8] $GirlsShare = \frac{\frac{TotalExpenditureonGirls}{TotalnumberofGirls}}{\frac{TotalExpenditure}{TotalNumberofChildren}} = \frac{PerGirl}{PerChild}$

**Table 1**
Share of Households' Education Expenditures for Boys and Girls and Expenditures incurred per Child.

| Variable | (1) All Households, excl travel cost | | (2) Households with Edu Exp > 0 | | (3) All Households, incl travel cost | |
|---|---|---|---|---|---|---|
| | Girls (N) | Boys (N) | Girls (N) | Boys (N) | Girls (N) | Boys (N) |
| Share of Education Expenditure (Ages 5–10) | 0.58*** (2301) | 0.79 *** (2463) | 1.0*** (1326) | 1.17*** (1656) | 0.58***(2300) | 0.79*** (2463) |
| Share of Education Expenditure (Ages 11–16) | 0.43*** (2055) | 0.82*** (2175) | 1.0*** (881) | 1.3*** (1400) | 0.43*** (2055) | 0.82*** (2175) |
| Annual expenditure per Child (Ages 5–10) | 1571*** (2300) | 2215*** (2463) | 2659*** (1359) | 3196***(1707) | 1598*** (1598) | 2264*** (2463) |
| Annual expenditure per Child (Ages 11–16) | 1656*** (2055) | 3064*** (2175) | 3833*** (888) | 4693*** (1420) | 1746*** (2055) | 3183*** (2175) |

Note:
\*\*\*Mean difference significant at 1 percent using t test.
Expenditures are in Pakistani Rupee.
Estimates based on pooled data of 4 rounds containing data on education expenditures on 12, 541 observations of children aged 5–16.

**Table 2**
Women's participation in decisions and AGE.

| Decisions Category | Participated (%) |
|---|---|
| Who in the household decides to allocate budget for Children's Education | 45 |
| Who in the household decided/decides how much education should female children of the household should receive? | 46.7 |
| Who in the household decided/decides how much education should male children in the household should receive? | 47 |
| Who has the final say in the household whether children should attend school or not? | 60 |
| **Women respondents' AGE** | |
| It is more important to send a boy to school than a girl. (Disagree; Binary Indicator 'AGE = 1') | 67 |
| How much education would you like your daughter to have? (Aspirations > 10 Grade) | 51 |
| Note: The table shows proportion of households where women report participation in decisions (1 = Yes) and where women report no participation in decisions (0 = No). The Binary categories have been created from list of responses of women, this list included responses as "myself", "My husband and I", "My husband", etc. All those responses where women are reported to have participated in the above decision are treated as (1 = Yes). These responses are of the main female respondent from the household. | |

schooling (grade 1–5) and ages 11–16 correspond to secondary schooling (grade 6–10). To calculate the shares, all children of the school age who were not attending school or had never been to school are treated as having zero expenditures. Table 1 shows the average shares of households' expenditure on schooling of girls and boys as well as the annual per child expenditure of households separately from pooled data of the four rounds.

Column (1) compares all households with children of the school age even if the children were not attending school. Shares are calculated considering zero expenditure (rather than missing expenditures) on schooling even if children were out of school or there were no out-of-pocket expenditures on schooling. It can be seen in this column that girls' shares are lower than that of boys in households' total education expenditures. The girls' shares are considerably lower than 1, for both age categories of children[9]. That means that girls receive less than the households' average expenditure on education. Table 1 also shows the average per child expenditure of a household. The per girl expenditure is significantly lower than households' expenditure per boy. In the age group (11–16) the per boy expenditure is 46 percent higher than the per girl expenditure. In Column (2) are compared only those households that have positive expenditure on children's schooling. In households that send girls to school, girls' shares are still lower than boys' shares. Comparisons in Columns (1) and (2) are based on households' expenditure on school fee, school uniform and books and stationery and exclude expenditure on children's travel to and from school. It can be argued that households spend more on travel of girls to and from school as girls are provided with safer and reliable means. Column (3) compares the shares and average expenditure of households including the travel costs. As evident from the Column (3), the differences in the

shares of education expenditures received by girls and boys remain significant.

The two explanatory variables of interest are women's role in household decisions regarding children's education and AGE. Decision-making module in the female questionnaire of the survey required the female respondent to state who were the decision makers of the household regarding various aspects of household life. A dummy variable is created based on the responses of the woman to the following four questions: 1. Who in the household has the final say about whether children attend school? 2. Who in the household allocates budget for children's education? 3. Who in the household decides/decided how much education girl children can attain? 4. Who in the household decides/decided how much education boy children can attain? Data on the former two is available for round 3 (2014) and round 4 (2017) only. Data on the latter two are available for rounds 2 (2013), round 3 (2014) and round 4 (2017, see Table 2). We construct a variable that takes value 1 if the respondent reported participation in all decisions that were enquired about in that round. This criterion is set as all rounds do not have all four questions. This binary variable allows to use all available data while giving equal weightage to each decision. Table 2 shows the share of women respondents who reported that they participated in the household's decisions either alone or together with other members of the household.

Table 2 shows that over half of the women respondents did not participate in decisions regarding schooling expenditures and education of boys and girls. Women seem to have more say in household decisions regarding sending children to school. In sixty percent of households, women had the final say on whether their children go to school or not. Women's responses varied to expressions such as "myself", "me and my husband", "my husband" etc. All responses where the woman included herself as a decision maker are translated into the category "participated" that means that the woman participated/participates in these decisions.

AGE is gauged from their response to the following statement "*It is

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[9] If households spent the same amount on girls and boys the shares would be unity, that is, the per girl or the per boy expenditure would equal households per child expenditures.

**Table 3**
Summary Statistics.

| Variables | (1) N | (2) mean | (3) sd | (4) max | (5) min |
|---|---|---|---|---|---|
| Girl Child, Binary Variable | 5,863 | 0.50 | 0.50 | 1 | 0 |
| Child's Age | 5,863 | 10.31 | 3.28 | 16 | 5 |
| Household Expenditure on Children Education, per year in PKR | | | | | |
| School Fee & Tuition (A) | 3,408 | 1,441 | 3,542 | 63,000.0 | 0.00 |
| School Uniform & Clothing (B) | 3,171 | 867 | 833 | 15,000.0 | 0.00 |
| Books and Stationery (C) | 3,408 | 1,224 | 2,112 | 70,000.0 | 0.00 |
| Education Expenditure (A + B + C) | 3,413 | 3,467 | 4,850 | 73,600.0 | 0.00 |
| Financial Aid for Schooling | 1,109 | 522 | 499 | 6,000.0 | 0.00 |
| Education Expenditure minus Financial Aid | 3,408 | 3,302 | 4,899 | 73,600.0 | −5,000.0 |
| Travel to & from School | 474 | 39,011.5 | 54,078.6 | 432,000.0 | 600.0 |
| Education Expenditure plus Travel minus Financial Aid | 3,408 | 8,728 | 25,986 | 435,130.0 | −5,000.0 |
| Expenditure per Girl | 5,859 | 1,521 | 3,383 | 73,600.0 | −5,000.0 |
| Expenditure per Boy | 5,863 | 2,380 | 4,065 | 48,300.0 | −560.0 |
| Girls' Share | 5,863 | 0.57 | 0.64 | 9.09 | −2.67 |
| Boys' Share | 5,863 | 1.06 | 0.92 | 12.00 | −7.09 |
| Child Share | 3,366 | 0.38 | 0.29 | 4.55 | −3.55 |
| Household Characteristics | | | | | |
| Woman Participates in Edu Decisions (Yes = 1) | 5,697 | 0.24 | 0.43 | 1.0 | 0.0 |
| AGE (Awareness of Gender Equality, Yes = 1) | 5,581 | 0.71 | 0.45 | 1.0 | 0.0 |
| Household Size | 5,863 | 8.90 | 4.13 | 37.0 | 3.0 |
| Children in the Household | 5,863 | 5.31 | 2.34 | 20.0 | 2.0 |
| Girls Aged 5–16 | 5,863 | 2.07 | 1.14 | 9.0 | 1.0 |
| Boys Aged 5–16 | 5,863 | 2.10 | 1.17 | 8.0 | 1.0 |
| Gender Of Current Household Head (Male = 1) | 5,863 | 0.97 | 0.16 | 1.0 | 0.0 |
| Schooling of the Head of the Household (Attended School = 1) | 5,857 | 0.49 | 0.50 | 1.0 | 0.0 |
| Household Head Literate (Yes = 1) | 5,863 | 0.47 | 0.50 | 1.00 | 0.00 |
| Household Income and Expenditure, per year PKR | | | | | |
| Income | 5,863 | 253,437.7 | 412,179.7 | 4,732,400.0 | 200.0 |
| Income per Capita | 5,863 | 28,356.1 | 44,933.6 | 708,333.3 | 33.33 |
| Cash Expenditure (Goods, Non-durables & Food) | 5,594 | 213,281.7 | 171,974.4 | 3,747,232.5 | 6,700.0 |
| Per Capita Cash Expenditure | 5,594 | 24,676.0 | 17,331.2 | 340,657.5 | 1,675.0 |
| Distance to School in Km | | | | | |
| Distance to Boy's Primary School | 5,863 | 1.38 | 2.11 | 30.0 | 0.00 |
| Distance to Boys' Secondary School | 5,863 | 2.38 | 2.76 | 30.0 | 0.00 |
| Distance to Girls' Primary School | 5,863 | 1.25 | 1.90 | 16.0 | 0.00 |
| Distance to Girls' Secondary School | 5,863 | 1.62 | 2.77 | 30.0 | 0.00 |

*more important to send a boy to school than a girl",* if a woman disagrees to the statement, she is considered having AGE, otherwise not. However, data on this variable is available in Rounds 3 and 4 only. For round 2 of the survey, AGE is gauged from her response to the following question *"How much education would you want your daughter to attain?".* If a woman's response is that she wants her daughter to complete at least high school level of education (10 years of schooling), she is coded as having AGE towards gender equality[10,11].

A majority (67 percent) of women disagree to the statement that it is more important to send boys to school than girls. Women who agree to the statement may either believe that returns to girls' education are lower than those of boys, or that girls do not benefit from receiving education as their tasks are household activities that do not require formal schooling. Also, women who agree to the statement may discriminate against girls and women due to their internalized inferior status. We recognize that an agreement or a disagreement to the statement does not linearly reflect women's AGE. However, it reflects that women believe that boys and girls may receive different treatment.

Women's aspirations for their daughters' education similarly do not reflect women's AGE unambiguously. The idea behind using women's

aspirations regarding their children's schooling as a gauge AGE was to compare women's aspirations for their daughters and sons, however, data on women's aspirations for their sons' education is not available. Hence, a comparison with their aspirations for boys cannot be made. However, we believe that the 10 years of schooling benchmark may reasonably indicate of AGE. Aspiring for 10 years of schooling for girls means that women aspire that their daughters educate over and above just reading and writing. Furthermore, by aspiring to keep their daughters in school until age 16/17 when 10 years of schooling is completed, women exhibit that they do not wish for their daughters to be married off in their teenage years.

## 4. Measures of AGE and women's participation in household decisions

It can be argued that women's AGE and women's participation in household decisions are two dimensions of women's empowerment that stem from similar underlying processes, making "aware" women more likely to take decision making roles. To assess if these variables are distinct, we report the pairwise correlations of the two variables with factors that have been observed to correlate with women's empowerment: age, education (three measures, ever attended school, literacy, and years of schooling), employment status (employed, not employed), income, number of sons, father's education, and ownership of mobile phones. These correlations are reported in Table A2 in the Annex. There is a positive but small correlation between the two measures. In addition, the two measures are correlated with other distinct factors, suggesting that women's AGE and participation in household decisions describe two different concepts. Decision making is significantly

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[10] Round 1 of the panel does not have a decision-making module; hence it is excluded from the analysis.

[11] The question, "How much education would you want your daughter to attain" was selected to compare women's responses to the related question "How much education would you want your son to attain". A comparison of women's aspirations for the education of their sons and daughters could convey her AGE. However, there is no data in round 2 for women's responses to aspirations regarding son's education.

**Table 4**
Dependent variable: Household's Share of Education Expenditures Spent on Girls (Ages 11–16).

| VARIABLES | (1) Girls Share | (2) Girls Share | (3) Girls Share |
|---|---|---|---|
| Woman's Participation in Decisions | 0.282* | 0.286* | 0.060 |
| | (0.162) | (0.166) | (0.243) |
| AGE | | 0.041 | −0.010 |
| | | (0.084) | (0.087) |
| *Decide * AGE* | | | 0.266 |
| | | | (0.197) |
| Observations | 695 | 695 | 695 |
| R-squared | 0.033 | 0.034 | 0.039 |
| Number of hid | 431 | 431 | 431 |

Robust standard errors in parentheses.
*** p < 0.01, ** p < 0.05, * p < 0.1.
Control Variables: Household size, gender of the household head, ratio of Adult Women to Men and Log of household per Person Annual Income.
All regressions include control variables and household and year fixed effects.

**Table 5**
Dependent variable: Household's Share of Education Expenditures Spent on Girls (Ages 11–16).

| Variables | (1) Girls Share | (2) Girls Share | (3) Girls Share |
|---|---|---|---|
| Woman's Participation in Decisions | 0.273** | 0.271** | 0.058 |
| | (0.136) | (0.134) | (0.207) |
| AGE | | −0.0199 | −0.0696 |
| | | (0.0803) | (0.075) |
| *Decide * AGE* | | | *0.250* |
| | | | *(0.195)* |
| Distance to Girls Secondary School | 0.0039 | 0.0035 | 0.0022 |
| | (0.012) | (0.013) | (0.013) |
| Distance to Girls Primary School | 0.0698 | 0.0698 | 0.069 |
| | (0.045) | (0.045) | (0.045) |
| Distance to Boys Secondary School | 0.0037 | 0.0041 | 0.0059 |
| | (0.039) | (0.039) | (0.038) |
| Distance to Boys Primary School | −0.276 | −0.277 | −0.275 |
| | (0.204) | (0.206) | (0.206) |
| Observations | 696 | 696 | 696 |
| R-squared | 0.211 | 0.211 | 0.215 |
| Number of hid | 432 | 432 | 432 |

Robust standard errors in parentheses.
*** p < 0.01, ** p < 0.05, * p < 0.1.
Control Variables: Household size, gender of the household head, ratio of Adult Women to Men and Log of household per Person Annual Income.
All regressions include control variables and household and year fixed effects.

positively correlated with woman's age, paid employment, and income, while these variables do not have a significant correlation with AGE. On the other hand, AGE has a significant positive correlation with our three measures of education (a dummy indicating if a woman is literate, a dummy indicating if the women ever attended school and the number of years of schooling), while these variables do not appear to be significantly correlated with women's role in household decisions. Ownership of mobile phone is the only variable that is correlated with both, woman's decision making and with AGE.

We also compare women who alone or together with other members of the household took decisions regarding everyday expenditures in the household with those who did not participate in these decisions[12] in round 3 of the survey and women with AGE, based on the response to the statement, *"It is more important to send a boy to school than a girl"* with women without AGE based on this statement. The comparison of their mean characteristics is provided in Table 3A (in the Annex). We do not comment on each comparison and only highlight a few notable observations.

Women, participating in decisions are on average older than those

not participating in decisions. There do not appear to be any significant difference in the schooling of the two groups or the number of years of schooling undertaken. However, women with AGE are significantly more likely to be literate and to have attended school than those without AGE. There are no statistically significant differences between the average annual income per person of households of women who participate in decisions and those who do not participate in decisions. On the other hand, there is a statistically significant difference in household's average annual income per person of the women with AGE; women with AGE belong to households with higher income per person. However, women who participate in household decisions have statistically significantly higher own incomes than those who do not participate. While the average income of women with AGE is not statistically different from the average income of women without AGE. Table 3A also provides a glance at the participation of women in household decisions in households belonging to different religions and ethnicities. The patterns point to an influence of cultural factors behind women's role in household decisions. The cultural influences decipherable in women's participation in household decisions are also, to some extent, mirrored

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[12] The comparison is limited to married primary respondents.

**Table 6**
Effects of women's decision making and AGE on the share of school expenditure per child in the household.

| Variables | (1) All Children | (2) Primary Children | (3) Secondary Children |
|---|---|---|---|
| Girl | −0.154*** | −0.195*** | −0.044 |
| | (0.034) | (0.048) | (0.089) |
| AGE (Awareness of Gender Equality) | −0.0092 | −0.0201 | −0.075* |
| | (0.018) | (0.024) | (0.043) |
| Decide (Woman's Participation in Decisions) | −0.034 | −0.0178 | −0.117* |
| | (0.022) | (0.023) | (0.070) |
| *Decide * Girl* | *0.0647* | *0.0972* | *0.195** |
| | *(0.057)* | *(0.076)* | *(0.117)* |
| *AGE * Girl* | *0.0279* | *0.126**** | *−0.135* |
| | *(0.032)* | *(0.041)* | *(0.115)* |
| *Girl * Decide * AGE* | *0.0146* | *−0.0917* | *−0.0341* |
| | *(0.066)* | *(0.077)* | *(0.128)* |
| Selection Equation | | | |
| Girl | −0.562*** | −0.598*** | −0.648*** |
| | (0.088) | (0.130) | (0.150) |
| Distance to Girls' Primary School | −0.0358** | −0.0268 | −0.0802* |
| | (0.017) | (0.021) | (0.042) |
| Distance to Boy's Primary School | 0.0275 | 0.0065 | 0.124* |
| | (0.017) | (0.0279) | (0.063) |
| Distance to Boys' Secondary School | −0.0226 | | −0.0260 |
| | (0.013) | | (0.016) |
| Distance to Girls' Secondary School | −0.0275*** | | −0.0212 |
| | (0.008) | | (0.015) |
| AGE (Awareness of Gender Equality) | 0.395*** | 0.146 | 0.389*** |
| | (0.085) | (0.120) | (0.127) |
| Decide (Woman's Participation in Decisions) | 0.224** | 0.165 | 0.128 |
| | (0.114) | (0.148) | (0.129) |
| *Decide * Girl* | *−0.0171* | *0.314* | *−0.0892* |
| | *(0.219)* | *(0.322)* | *(0.299)* |
| *AGE * Girl* | *0.0252* | *0.275** | *−0.0004* |
| | *(0.105)* | *(0.158)* | *(0.176)* |
| *Girl * Decide * AGE* | *0.230* | *−0.202* | *0.153* |
| | *(0.231)* | *(0.368)* | *(0.296)* |
| Constant athrho | 0.686 (0.462) | −2.246*** (0.590) | 1.976*** (0.731) |
| Constant lnsigma | 0.475*** (0.110) | 0.594 (0.517) | −0.625** (0.278) |
| Observations | 5,562 | 2,225 | 1,818 |

Robust standard errors in parentheses
*** p < 0.01, ** p < 0.05, * p < 0.1

Note: Control variables include child's age, gender and schooling of household head, log of household income per capita, village and year fixed effects.

in women's AGE. In the last part of annex Table 3A, the characteristics of woman's parents and the circumstances of her marriage and children are also compared.[13]

These comparisons suggest that women's participation to household's decisions and women's AGE can be considered two distinct variables. Therefore, both the variables are used in the analysis below. There are other limitations of the dataset. The panel is unbalanced as round 4 was limited to only a subset of the sample. Household consumption expenditures as an important explanatory/control variable is not available for round 4[14], hence household income is calculated in each round and is used instead of consumption. Our pooled data has observations on 8,292 children aged 5–16. For our estimates, we keep data for children living in households with children of both genders- this drops an additional 2,277 observations. Moreover, we drop 152 observations where households have not reported income. Table 3 below summarizes this data.

### 4.1. Estimation and identification Strategy

The following equation is estimated to assess the effects of women's decision-making and AGE on households share of education expenditures spent on girls:

$$GirlsShare_{i,t} = \alpha_1 Dec_{i,t} + \alpha_2 AGE_{i,t} + \alpha_3 Dec*AGE_{i,t} + \alpha_4 X_{i,t} + \omega_i + \Phi_t + \epsilon_{i,t} \tag{1}$$

$GirlsShare_{i,t}$ is share of household i's education expenditure spent on the education of girls in time period t. $Dec_{i,t}$ is a binary variable that takes value 1 if women respondent from household i at time period t reports participating in decisions regarding education of children. $AGE_{i,t}$ is a binary variable that takes value 1 if woman in household i at time period t has $AGE$. $X_{i,t}$ are characteristics of household i at time period t including households annual per person income, household size, ratio of adult women to men in the household, ratio of girls to boys in the household. $\omega_i$ are the household fixed effects and $\Phi_t$ are year fixed effects. Equation (1) is estimated at the household level. Robust Standard errors are calculated.

The dataset includes children who do not attend school[15] suggesting

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[13] Observations on these data are fewer than the observations on which rest of the table is based. The number of primary female respondents who are married in 1663. Data on natal family, age at marriage and age at first birth is available for 1560 women

[14] Households' expenditures on children's schooling are available for all rounds.

[15] Respondents were asked to report on the schooling of all children in the 5–16 age bracket residing in the household at the time of the survey. The households reported if the child was attending school and if the child was attending school, the details of school and school related expenditures were recorded. If the child was not attending school at the time of the survey, it was inquired if the child had ever attended school. Children in the age bracket 5–16 who were either not attending school at the time of the survey or had never attended school are out of school children with missing schooling and school related expenditures.

**Table 7**

Effects of women's decision making and AGE on the share of school expenditure per child in the household (distance to school < 1.5 Kms).

| Variables | (1) All Children | (2) Primary Children | (3) Secondary Children |
|---|---|---|---|
| Girl | −0.178*** | −0.204*** | −0.218** |
| | (0.048) | (0.046) | (0.088) |
| AGE (Awareness of Gender Equality) | −0.017 | 0.029 | −0.054 |
| | (0.023) | (0.027) | (0.051) |
| Decide (Woman's Participation in Decisions) | −0.0491** | −0.00812 | −0.0932* |
| | (0.022) | (0.031) | (0.053) |
| *Decide * Girl* | *0.111* | *0.169*** | *−0.129* |
| | *(0.081)* | *(0.075)* | *(0.102)* |
| *AGE * Girl* | *0.0001* | *0.153**** | *−0.0550* |
| | *(0.048)* | *(0.050)* | *(0.089)* |
| *Girl * Decide * AGE* | *0.0179* | *−0.158** | *0.318**** |
| | *(0.080)* | *(0.086)* | *(0.111)* |
| **Selection Equation** | | | |
| Girl | −0.592*** | −0.519*** | −0.836*** |
| | (0.138) | (0.135) | (0.250) |
| Distance to Girls' Primary School | 0.0477 | −0.439*** | −0.0674 |
| | (0.155) | (0.137) | (0.238) |
| Distance to Boy's Primary School | −0.336** | −0.119 | −0.308 |
| | (0.144) | (0.137) | (0.202) |
| Distance to Boys' Secondary School | −0.0512 | | −0.316* |
| | (0.089) | | (0.168) |
| Distance to Girls' Secondary School | −0.144 | | −0.384** |
| | (0.100) | | (0.170) |
| AGE (Awareness of Gender Equality) | 0.182 | 0.318** | 0.180 |
| | (0.114) | (0.135) | (0.206) |
| Decide (Woman's Participation in Decisions) | 0.0614 | 0.272 | −0.0563 |
| | (0.170) | (0.177) | (0.212) |
| *Decide * Girl* | *−0.455* | *0.725*** | *−0.884** |
| | *(0.312)* | *(0.308)* | *(0.487)* |
| *AGE * Girl* | *−0.0423* | *0.256* | *−0.189* |
| | *(0.161)* | *(0.165)* | *(0.297)* |
| *Girl * Decide * AGE* | *0.756*** | *−0.544* | *1.344**** |
| | *(0.322)* | *(0.369)* | *(0.471)* |
| Constant athrho | 1.904*** (0.545) | −2.061*** (0.659) | 5.514*** (1.010) |
| Constant lnsigma | 0.731*** (0.273) | 1.431*** (0.158) | 0.956* (0.558) |
| Observations | 2,144 | 1,524 | 790 |
| Robust standard errors in parentheses | | | |
| *** p < 0.01, ** p < 0.05, * p < 0.1 | | | |

Note: Control variables include child's age, gender and schooling of household head, log of household income per capita, village and year fixed effects.

that households where children attend school self-select. We also estimate a Heckman selection model to take selection into account. The exogenous variable used in the selection equation is the households' distance to school. Households' distance to school is correlated with school enrolment but it is unlikely to be correlated with households' expenditure on schooling[16].

$$ChildShare^*_{j,i} = \beta_0 + \beta_1 Girl_{j,i} + \beta_2 Dec_i + \beta_3 Dec_i*Girl_{j,i} + \beta_4 AGE_i$$
$$+ \beta_5 AGE_i*Girl_{j,i} + \beta_6 Dec_i*Girl_{j,i}*AGE_i + \lambda C_{j,i} + \theta X_i + \pi_v + \Omega_t + \varepsilon_i. \quad (2)$$

where, $ChildShare^*_{j,i}$ is the share of education expenditure of household i spent on child j. $Girl_{j,i}$ is a dummy variable that equals 1 if the child j, in the household i, is a girl. $Dec_i$ is women's participation in children's education decisions in household i. $AGE_i$ is the awareness of gender equality in women in household i. The estimated coefficient on the interaction of indicators of women's participation in decision-making and dummy variable $Girl_{j,i}$, $\beta_3$, shows the impact of women's participation in decisions on girls' shares. The coefficient on the interaction between indicator of AGE and dummy variable $Girl_{j,i}$, $\beta_4$, captures the impact of AGE on girls' share. The coefficient of the interaction of three terms, $Dec_i*Girl_{j,i}*AGE_i$, $\beta_6$ captures the effect of women's decision making and AGE on the girls' shares. $X_i$ is a vector of household i's demographic and economic characteristics, $C_{j,i}$ are the characteristics of

child j, in household i, $\pi_v$ are the village fixed effects, $\Omega_t$ are the year fixed effects and $\mu_i$ is the error term.

## 5. Selection equation

$$ChildSchool_{j,i} = \rho_0 + \rho_1 X_i + \rho_2 C_{j,i} + \rho_3 Distance_i + \varepsilon_i \quad (3)$$

$$ChildSchool = \begin{cases} ChildSchool = 1, if \rho_1 X_i + \rho_2 C_{j,i} + \rho_3 Distance_i > 0 \\ ChildSchool = 0, if \rho_1 X_i + \rho_2 C_{j,i} + \rho_3 Distance_i \leq 0 \end{cases}$$

$$ChildShare_{j,i} = ChildShare^*_{j,i} if ChildSchool_{j,i} = 1$$

In the selection equation $X_i$ is a vector of household characteristics, $C_{j,i}$ are the characteristics of child j from household i and $Distance_i$ is the household's distance to school. The Heckman Selection Model is estimated at the individual level suing the sample of all children in the school age groups (ages 5–10 and ages 11–16) in the households. Children of the school age not attending school have missing values for their shares. The analysis is conducted separately for households with children in the primary school age group (ages 5–10) and those with children in the secondary school age group (11–16). In the Heckman Selection Model, we cluster the standard errors at the household.

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[16] Households' expenditure on travel to school were excluded from expenditures on schooling for this analysis.

## 6. Results

### 6.1. Effects of women's decisions and AGE on the Girls' share in household education expenditure (OLS)

Table 4 below shows the results of estimation of equation 1 for households that had both boys and girls in the age group 11–16 at the time of the survey[17]. In our estimates we controlled for household fixed effects and year fixed effects. All three columns of Table 4 show estimates obtained controlling for household characteristics expected to affect households' shares of expenditures spent on the education of girls[18] sampling weights from round 1 of the survey[19].

The results suggest that households where woman participate in decisions regarding children education have higher shares of their education expenditures spent on girls. The average share of households' education expenditures spent on the education of girls in the sample is 0.44[20]. Households where women have reported participating in decisions, indicated by binary variable "Woman's participation in Edu Decisions" have significantly higher shares. The value of the coefficient is 0.28 which means that households where women participate in decisions have up to 64 percent higher shares for girls than the average share.

The hypothesis that women do not use their role in household decisions to reduce gender inequality within the households unless aware of gender equality is not supported by our findings from this model as the coefficient of women's consciousness is not significant.

We also test if including school distances to our fixed effects model affects our results, even if the variable might be endogenous to the model. In Table 5 we check if the distance to school has a significant effect on the share of household education expenditure on children. The results show that once we control for distance to school, women's participation in the household's decisions increases the school expenditure share per child by 27 percentage points at the 5 percent level of significance and that the result is robust when introducing AGE into the equation. However, the result fades away when we introduce an interaction of decision making and AGE, potentially due to the composition of the sample.

Girls' shares have been calculated by excluding household expenditures on children's travel to and from school. We further re-estimate equation (1) by calculating girls' shares including households' expenditures on children's travel to and from school. The results are shown in the Annex (Table A5)- results presented in A5 corroborate the effects seen earlier: households where women participate in decisions regarding children's education have higher shares of these expenditures spent on girls.

In the fixed effects model estimated above, the selection of households into sending children to school has not been tackled. These households have been assumed to have zero expenditures on children not attending school. In this way a change in the share of household expenditures spent on schooling of girls may change if girls previously not enrolled in school are enrolled in school and therefore start receiving a share of expenditures on schooling. However, this share may also increase if households increase expenditures on girls already enrolled in school. The underlying assumption is that the processes that lead households to enrol girls to school are similar to those that lead households to increase spending on girls schooling. In the section below we change is assumption and tackle children's selection into school. Equation (1) was estimated at the household level, for the Heckman Selection Model, the analysis is at the individual level. Instead of the households of education spent on girls, the dependent variable of the Heckman Model is the share of education expenditure spent on each individual child.

### 6.2. Heckman selection model

We first estimate the effect of AGE and women's decision participation on the share of household education expenditures spent on each child. We consider households' distance to school a selection variable that effects households' decision to send children to school but does not affect our dependent variable the share of households' education expenditure spent on an individual child. Table A6 and A7 in the Appendix supports the exclusion restriction; girls' shares are not correlated with distance to primary or secondary school and boys' shares do not have a significant correlation with distance to secondary school. The correlation with boys' primary school appears significant but the magnitude is small. We interact the dummy variable indicating the child's gender with AGE and women's decision participation to assess the effect of these two variables on the shares of school expenditure on girls in households where women have AGE and take decisions regarding children's schooling. The estimates are restricted to households with both boys and girls of the school going age present in the household. Distance to girls' primary and secondary school are significantly negatively correlated with school enrolment (Table 6, selection equation[21]).

Table 6 (Column 1) shows the results for all children of the schooling age (5–16) in three rounds of the PRHPS (2, 3 and 4). The selection variables are households' distance to girls' and boys' primary and secondary school. The estimates for all children shown in Column 1 show that once we account for sample selection, overall, girls receive a share of school expenditure of 15.4 percentage points lower than boys (at the one percent level of significance) and that women's involvement in household's decisions and AGE do not have a significant effect on the distribution of the share of school expenditure across gender. However, when we estimate the results separately for primary and secondary school children, women's participation in household's decisions and AGE do have an impact on the distribution of education expenditures across gender (Table 7).

Column 2 shows that primary school expenditure on a girl child is 19.5 percentage points lower than for a boy (at the one percent level of significance). Also, the results show that AGE increases the share of school expenditure on a girl child by 12.6 percentage points (at the one percent level of significance) compared to boys and women's participation in the household's decision increase overall the share of school expenditure on girls enrolled in secondary school by 19.5 percentage points (at the 10% level of significance) compared to boys (Column 3). These results support the importance of AGE in addition to decision making to reduce gender inequality.

Overall, our results appear to be consistent with the stream of literature which find that when women participate in household decisions, they redistribute more resources in favour of children. However, what is noteworthy is the significant positive association of women's participation in household decisions with the shares spent on girls in the secondary school age group. On the other hand, the coefficient of the variable Decide that shows the association with boys' shares is negative suggesting that perhaps women channel household resources towards girls when they are in decision making position.

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[17] Results of estimation of equation 1 for households with children of the primary school level are not being reported here as there are no significant effects. These are provided in the appendix, Table A4.

[18] Data for Households' annual consumption expenditure per person is not available for Round 4 of the survey that is why income estimates in all rounds of the survey have been used instead.

[19] Details of the calculation of household sampling weights are found in Nazli, H., & Haider, S.H. (2012). Pakistan Rural Household Panel Survey 2012 (Round 1): Methodology and community characteristics. Pakistan Strategy Support Program. Sampling weights are inverse of probability of being selected in the sample.

[20] The sample is of households that had children of both sexes of the ages 11–16 present in khe household at the time of the survey and excluding Round 1. The average for the full sample shown in 1 Table 1is 0.43.

[21] Distance to primary and secondary schools are included in the analysis for all children (5–16) and children of secondary school age group (11–16). In the analysis of primary school children, only distances to primary school are included.

## 7. Robustness checks

It can be argued that expenditures on travel to and from school are a significant component of expenditure on children's schooling when school is far away. To allay this concern, we exclude households that reported distances over 1.5 Kms to the nearest primary school and 2 Km to secondary school, it is assumed that schools nearer these distances can be accessed relatively costless (walk, bicycle). We checked the robustness of our estimates running our estimates on this smaller sample excluding household with longer distances to school from the sample. The results are fairly stable using this specification and increase in both magnitude and significance supporting the hypothesis that distance to school plays a role in the decision of sending children to school. In addition, when distance to school is within 1.5 Kms the combination of both the ability of participating into household's decisions and AGE increases the share of household's education expenditure on girls of 31.8 percentage points with respect to boys, supporting our hypothesis.

While a significant and negative coefficient on the interaction term, decide, AGE and girl in the primary school age is odd, it may be that women who take decisions and have AGE spend more on girls at the secondary school level than those at the primary level.

To further delineate the possible mechanisms of the effects that our variables capture, we report in the appendix (Table A8) the results where we include the interaction of women's decision making, women's AGE with the dummy indicating child's gender and keeping in the equation the category of boys. By keeping the interaction of our three dummy variables, *Decide * Girl * AGE* as well as *Decide * Boy * AGE*, the omitted category in the whole equation becomes of boys living in households where women do not decide and do not have AGE. Our results indicate that boys in households where woman decide and have AGE have significantly lower shares spent on their education compared to boys living in households where women do not participate in decisions and do not have AGE. This points out that in households where women participate in decisions and have AGE, there is a redistribution of resources towards girls.

We have constructed our explanatory variable, women's participation in household decisions as a binary whereby it takes value "1" if a woman alone or with other members of the household participates in decisions. We test the impact of women's decision making when they take these decisions alone. Here, we construct the binary variable decide so that it takes value "1" if the woman takes the decision alone. The results are presented in the appendix (Table A9). The coefficient of the interaction term for woman's decision and dummy indicating child's gender increases in magnitude.

## 8. Conclusions

This paper explores the relationship between women's role in household

decisions with gender equality within households together with women's AGE. The dimension of equality that is explored is household's expenditures on education of girls and boys. We use the share of households' education expenditure spent on the schooling of girls instead of the total or actual expenditures that allows us to assess the effects on gender equality of these expenditures. Moreover, by using the shares instead of the total expenditure (or expenditure on each child), we are able to control for factors other that may affect households' total expenditure on children's education (such as income or wealth) without changing the gendered distribution. We exploit a longitudinal dataset and employ fixed effects model to tackle fixed heterogeneity of women's decision participation at the household level over time and to control for time trends. In addition, we used a Heckman's selection model to deal with selection into the sample as women who are more likely to take household's decisions might also be those more likely to send girl's to school.

Our results suggest that for households with children in the school age group (11–16) of both genders, the share of education expenditures spent on girls increases by up to 64 percent than the average share when women participate in decisions regarding children's education suggesting that households where women participate in decisions, inequality in households reduces. Further in the analysis we account for selection of households into sending children to school using the Heckman Selection Model. The selection variable that we use is households' distance to girls' and boys' school.

The results of the Heckman Selection Model suggest that girls of the primary school age in households where women have AGE receive significantly higher expenditures on their schooling. We also show that girls of the secondary school age living in households where women participate in decisions have higher shares of household education expenditure.

Women's role in household decisions is an important component of indicators of women's empowerment. It is less established if this role is instrumental in reducing gender inequality. It can be argued that women in gender unequal societal contexts do not use their role to reduce inequality as they themselves have internalized women's inferior status. Our results suggest that women's participation in household decisions can be instrumental in reducing inequality. We acknowledge an obvious limitation of this study is that our Heckman Selection Model is based on pooled data and does not fully account for individual fixed heterogeneity across women in the sample. Future research could improve the identification of the impact of AGE on gender inequality.

## Appendix

Tables A8–A16

### Table A1
Pakistan's Social Indicators by Sex.

| | PSLM (2014–15) | | | | PRHPS (2013–14) | |
|---|---|---|---|---|---|---|
| | Overall | | Rural | | | |
| | Male | Female | Male | Female | Male | Female |
| Population Distribution (LFS, 2017–18) | 50.8 | 49.2 | 32.0 | 31.5 | 50.6 | 49.3 |
| Adult Literacy Rate | 70 | 49 | 63 | 38 | 56.2 | 32.6 |
| Net Enrolment Rate (Primary, age 6–10) | 72 | 62 | 69 | 56 | 53.8 | 49.4 |
| Net Enrolment Rate (Middle, age 11–13) | 39 | 34 | 36 | 27 | 29 | 22 |
| | Labour Force Survey (2017–18) | | | | | |
| Adult Literacy Rate | 72.5 | 51.8 | 66.3 | 40.4 | – | – |
| Education (<10 years of School) * | 42.9 | 30.5 | 44.7 | 28.4 | | |
| Education (>10 years of School) | 21 | 14.8 | 16.5 | 8.8 | | |
| Tertiary Education Rate | 6.8 | 5.0 | 3.6 | 2.2 | 2 | 1.4 |
| Labour Force Participation (refined) | 68 | 20.1 | 68 | 25.6 | 65 | 14.5 |
| Labour Force Participation (augmented) | 51.6 | 34.7 | 57.3 | 45.6 | – | – |

Sources: Pakistan Social and Living Standards Measurement Survey (PSLM), 2014–15. Pakistan Bureau of Statistics, Statistics Division, Government of Pakistan. Labour Force Survey, (LFS), 2017–18. Pakistan Bureau of Statistics, Statistics Division, Government of Pakistan.
* The percentage of population aged 10 and above who attended school but completed<10 years of education. The category is the sum of population proportions in

three categories. These categories are 1. KG but below primary (<5 years of school) 2. Primary but below middle (<8 years of school) and 3. Middle but below Matric (<10 years of school).

**Definitions from the PSLM:**

Net Enrolment Rate (NER) at Primary Level: Primary NER is the number of children aged 6 to 10 years attending primary level (classes 1–5) divided by the number of children aged 6 to 10 years.

Net Enrolment Rate (NER) at Middle Level: Middle NER is the number of children aged 11–13 years attending middle level (classes 6–8) divided by number of children aged 11–13 years.

Literacy rates: Population aged 10 years and older that is literate expressed as a percentage of the population aged 10 years and older where literacy is defined as the ability to read a newspaper and to write a simple letter.

**Definitions from LFS:**

Refined Activity Rate: Refined activity rate is the currently active population expressed as a percentage of the population 10 years and above.

Augmented Activity: Augmented activity rate is based on probing questions from the persons not included in the conventional measure of labour force, to net-in marginal economic activities viz subsistence agriculture, own construction of one's dwelling etc. Conventionally, persons 10 + aged reporting housekeeping and other related activities are considered out of labour force. However, from the perspective of time use, they are identified as employed if they have spent time on a specific set of marginal economic activities mentioned afore.

Tertiary Education: Percentage of population aged 10 and above who have completed graduate or above level of education.

**Definitions for PRHPS:**

Literacy is defined as ability to read, write and basic numeracy

NER at primary level is calculated as the percentage of children aged (6–10) enrolled in school of the total children aged (6–10).

NER at Middle level calculated as the percentage of children aged (11–13) enrolled in school and attending grades 4 or above of the total children aged (11–13).

Statistics from the PRHPS are author's own calculations.

**Table A2**

Pairwise correlation.

| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) Participates in Everyday Expenditures (Dummy, 1 = Yes) | 1.000 | | | | | | | | | | |
| (2) Awareness of Gender Equality (Dummy, 1 = Yes) | 0.220* | 1.000 | | | | | | | | | |
| | 0.000 | | | | | | | | | | |
| (3) Woman's Age | 0.119* | −0.033 | 1.00 | | | | | | | | |
| | 0.000 | 0.182 | | | | | | | | | |
| (4) Has ever attended School? (Dummy, 1 = yes) | 0.010 | 0.155* | −0.245* | 1.000 | | | | | | | |
| | 0.700 | 0.000 | 0.000 | | | | | | | | |
| (5) Years of Schooling | 0.035 | 0.152* | −0.216* | 0.866* | 1.000 | | | | | | |
| | 0.151 | 0.000 | 0.000 | 0.000 | | | | | | | |
| (6) Literacy (Dummy, 1 = Yes) | 0.052 | 0.156* | −0.218* | 0.896* | 0.896* | 1.000 | | | | | |
| | 0.052 | 0.000 | 0.000 | 0.000 | 0.000 | | | | | | |
| (7) Paid Employment (Dummy, 1 = Yes) | 0.082* | −0.022 | −0.060 | −0.055 | −0.065 | −0.069 | 1.000 | | | | |
| | 0.001 | 0.374 | 0.014 | 0.026 | 0.008 | 0.005 | | | | | |
| (8) Woman's Earned Income | 0.094* | −0.012 | −0.041 | 0.075 | 0.148* | 0.103* | 0.214* | 1.000 | | | |
| | 0.000 | 0.614 | 0.094 | 0.002 | 0.000 | 0.000 | 0.000 | | | | |
| (9) Number of Sons | 0.034 | −0.076 | 0.170* | −0.135* | −0.136* | −0.123* | 0.008 | −0.016 | 1.000 | | |
| | 0.163 | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.752 | 0.513 | | | |
| (10) Father's Education | −0.039 | −0.047 | 0.021 | −0.118* | −0.152* | −0.142* | 0.104* | −0.028 | 0.011 | 1.000 | |
| | 0.120 | 0.065 | 0.417 | 0.000 | 0.000 | 0.000 | 0.000 | 0.262 | 0.663 | | |
| (11) Owns Mobile Phone (Dummy, 1 = yes) | 0.110* | 0.110* | −0.073 | 0.323* | 0.383* | 0.355* | −0.066 | 0.104* | −0.059 | −0.151* | 1.000 |
| | 0.000 | 0.000 | 0.003 | 0.000 | 0.000 | 0.007 | 0.000 | 0.016 | 0.0000 | | |

* shows significance at the 0.001 level.

**Table A3**

Mean comparisons of characteristics of women who participate with those who do not and of women with AGE.

| | (1) | | | (2) | | |
|---|---|---|---|---|---|---|
| | Participates in Decisions (%) | Does not Participate (%) | p-value[1] (Pearson's Chi2) | Aware of gender equality (%) | Not aware of gender equality (%) | p-value[1] (Pearson's Chi2) |
| Number of Observations | 963 | | | | | |
| (58) | 700 | | | | | |
| (42) | | 1077 | | | | |
| (65) | 586 | | | | | |
| (35) | | | | | | |
| Age | 42*** | 39*** | | 40.5 | 41.3 | |
| **Education** | | | | | | |
| Percent Literate | 17** | 13** | 0.037 (0.034) | 19*** | 7.6*** | 0.0000 (0.00) |
| Percent Attended School | 18 | 17 | | 22*** | 9.7*** | 0.000 (0.000) |
| Number of years of Schooling[2] | 1.2 | 1.0 | | 1.4*** | 0.6*** | 0.0000 |
| **Employment and Income** | | | | | | |
| Household Annual Income per person (in PKR) | 42,910 | 38,241 | | 44228*** | 34897*** | 0.0042 |
| Household Income Quintile[3] | | | 0.000 (0.000) | | | 0.012 (0.012) |

**Table A3** (*continued*)

| | (1) | | | (2) | | |
|---|---|---|---|---|---|---|
| | Participates in Decisions (%) | Does not Participate (%) | p-value[1] (Pearson's Chi2) | Aware of gender equality (%) | Not aware of gender equality (%) | p-value[1] (Pearson's Chi2) |
| First | 49 | 51 | | 60 | 40 | |
| Second | 60 | 40 | | 62 | 38 | |
| Third | 62 | 38 | | 68 | 32 | |
| Fourth | 60 | 40 | | 70 | 30 | |
| National Identity Card | 86 | 84 | | 86 | 85 | |
| Percent Employed | 23*** | 16*** | 0.001 (0.001) | 19.5 | 21.3 | |
| Own Income (in PKR) | 11504*** | 6387*** | 0.0001 | 9103 | 9803 | 0.6142 |
| **Asset Ownership** | | | | | | |
| Land, House, Car | 1.9 | 1.4 | | 2 | 1 | |
| Large Livestock | 5.7 | 6.4 | | 6.2 | 5.6 | |
| Small Livestock | 9.2 | 9.1 | | 10 | 7 | |
| Consumer Durables | 8.9 | 9.1 | | 11 | 5.3 | 0.0000 |
| Mobile Phone | 12 | 5.7 | 0.000 (0.000) | 12 | 5 | 0.0000 |
| **Religion and Ethnicity** | | | | | | |
| Religion | | | 0.004 (0.003) | | | 0.0000 |
| Muslims | 58.5 | 41.5 | | 65.5 | 35.5 | |
| Hindus and Christians | 34 | 66 | | 32 | 68 | |
| Ethnicity | | | 0.000 (0.000) | | | 0.000 0.000 |
| Punjabi | 76 | 24 | | 74 | 26 | |
| Sindhi | 28 | 72 | | 47 | 53 | |
| Baloch | 30 | 70 | | 44 | 56 | |
| Pashtun | 60.5 | 39.5 | | 74 | 26 | |
| Other | 60 | 40 | | 67.5 | 32.5 | |
| **Natal Family and Marriage** | | | | | | |
| Number of Children | 3.4 | 3.3 | | 3.3 | 3.5 | 0.0124 |
| Sons | 1.9 | 1.8 | | 1.8 | 2 | 0.0019 |
| Daughters | 1.4 | 1.4 | | 1.4 | 1.5 | |
| Sons to Daughters | 1.4 | 1.3 | | 1.3 | 1.4 | |
| Father's Education[4] | 0.61 | 0.65 | | 0.74 | 0.43 | |
| Mother's Education[5] | 0.1 | 0.1 | | 0.13 | 0.09 | |
| Age at Marriage[6] | 19.6*** | 20.6*** | 0.0032 | 20 | 20 | |
| Age at First Birth[7] | 21.8*** | 23*** | 0.0000 | 22 | 22 | |

1. p-value of Fischer's Exact test. p-values in parentheses correspond to Pearson's Chi. p-values higher than 0.1 are not reported.
2. Data on schooling of 16 women is missing, averages based on 1647 observations.
3. Income quintiles are based on households' annual income per person.
4. Data on Father's Education missing for 103 observations, averages based on 1560 observations.
5. Data on Mother's Education missing for 103 observations, averages based on 1560 observations.
6. Data on Age at marriage missing for 103 observations, averages based on 1560 observations.
7. Data on age at first birth missing for 103 observations, another 65 women had not given birth. Averages based on 1495 observations.

**Table A4**

Dependent variable: Household's Share of Education Expenditures Spent on Girls (Ages 5–10).

| Variables | (1) Girls Share | (2) Girls Share | (3) Girls Share |
|---|---|---|---|
| Woman's Participation in Edu Decisions, Binary Variable | 0.277 | 0.278 | 0.122 |
| | (0.175) | (0.179) | (0.251) |
| AGE, Binary Variable | | 0.0140 | −0.0161 |
| | | (0.0837) | (0.0865) |
| *Decide * AGE* | | | 0.180 |
| | | | (0.196) |
| Observations | 663 | 663 | 663 |
| R-squared | 0.036 | 0.036 | 0.038 |
| Number of hid | 415 | 415 | 415 |
| All Controls, Year FE, Household FE | Yes | Yes | Yes |

Robust standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Control Variables: Household size, Sex of the household head, Ratio of Adult Women to Men and Log of household per Person Annual expenditure.

**Table A5**
Dependent variable: Household's Share of Education Expenditures Spent on Girls (Ages 11–16).

| Variables | (1) Girls Share | (2) Girls Share | (3) Girls Share |
|---|---|---|---|
| Woman's Participation in Edu Decisions, Binary Variable | 0.280* | 0.283* | 0.0550 |
| | (0.160) | (0.162) | (0.212) |
| Woman's Consciousness, Binary Variable | | 0.0323 | −0.0212 |
| | | (0.0730) | (0.0662) |
| *Decide * Conscious* | | | 0.267 |
| | | | (0.184) |
| Distance to Boys' Secondary School | 0.00198 | 0.00134 | 0.00342 |
| | (0.0382) | (0.0379) | (0.0375) |
| Distance to Girls' Secondary School | −0.00636 | −0.00575 | −0.00710 |
| | (0.0194) | (0.0193) | (0.0191) |
| Observations | 696 | 696 | 696 |
| R-squared | 0.035 | 0.035 | 0.040 |
| Number of hid | 432 | 432 | 432 |

Robust standard errors in parentheses.
*** p < 0.01, ** p < 0.05, * p < 0.1.
Control Variables: Household size, Sex of the household head, Ratio of Adult Women to Men and Log of household per Person Annual Income.

**Table A6**
Correlation of Girls' Shares and Distance to Primary and Secondary School.

| | (1) Share of Edu Exp on Child | Distance to Girls' Primary School | Distance to Girls' Secondary School |
|---|---|---|---|
| Share of Edu Exp on Child | 1.00 | | |
| Distance to Girls' Primary School | −0.03 | 1.00 | |
| Distance to Girls' Secondary School | 0.05 | 0.18*** | 1.00 |
| Observations | 1454 | | |

* p < 0.05, ** p < 0.01, *** p < 0.001.

**Table A7**
Correlation of Boys Shares and Distance to Primary and Secondary School.

| | (1) Share of Edu Exp on Child | Distance to Boy's Primary School | Distance to Boys' Secondary School |
|---|---|---|---|
| Share of Edu Exp on Child | 1.00 | | |
| Distance to Boy's Primary School | 0.07** | 1.00 | |
| Distance to Boys' Secondary School | 0.03 | 0.30*** | 1.00 |
| Observations | 1912 | | |

* p < 0.05, ** p < 0.01, *** p < 0.001.

**Table A8**
Effects of women's decision making and AGE on the share of school expenditure per child in the household.

| VARIABLES | (1) All Children | (2) Primary Children | (3) Secondary Children |
|---|---|---|---|
| Girl | −0.181*** | −0.184*** | −0.185** |
| | (0.0507) | (0.0500) | (0.0914) |
| AGE (Awareness of Gender Equality) | −0.0215 | −0.0632* | 0.00325 |
| | (0.0270) | (0.0323) | (0.0552) |
| Decide | −0.0694 | −0.185*** | 0.201* |
| | (0.0473) | (0.0615) | (0.104) |
| *Decide * Girl* | 0.131 | 0.199** | −0.392** |
| | (0.0942) | (0.0864) | (0.157) |
| *AGE * Girl* | 0.00393 | 0.164*** | −0.0944 |
| | (0.0501) | (0.0528) | (0.0905) |
| *Decide * AGE * Boy* | 0.0245 | 0.193*** | −0.340*** |
| | (0.0525) | (0.0695) | (0.110) |
| *Decide * AGE * Girl* | 0.0182 | −0.0424 | 0.275*** |
| | (0.0792) | (0.0774) | (0.103) |
| Selection Equation | | | |
| Girl | −0.635*** | −0.563*** | −0.808*** |
| | (0.139) | (0.141) | (0.257) |
| Distance to Girls' Primary School | 0.0547 | −0.504*** | −0.0672 |
| | (0.152) | (0.190) | (0.239) |
| Distance to Boy's Primary School | −0.343** | −0.450*** | −0.297 |
| | (0.144) | (0.155) | (0.206) |
| Distance to Boys' Secondary School | −0.0550 | | −0.326* |
| | (0.0889) | | (0.169) |
| Distance to Girls' Secondary School | −0.142 | | −0.381** |
| | (0.100) | | (0.179) |
| AGE | 0.119 | 0.0993 | 0.222 |
| | (0.124) | (0.158) | (0.220) |
| Decide | −0.346 | −0.174 | 0.0566 |
| | (0.320) | (0.342) | (0.395) |
| *Decide * Girl* | −0.0568 | 0.710** | −0.987 |
| | (0.354) | (0.276) | (0.607) |
| *AGE * Girl* | 0.0186 | 0.238 | −0.234 |
| | (0.163) | (0.180) | (0.308) |
| *Decide * AGE * Girl* | 0.767** | −0.231 | 1.345*** |
| | (0.326) | (0.483) | (0.478) |
| Constant athrho | 1.958*** | −1.405*** | 5.514*** |
| | (0.542) | (0.800) | (1.007) |
| Constant lnsigma | 0.736*** | 0.141 (0.189) | 0.929 (0.628) |
| | (0.271) | | |
| Observations | 2,144 | 1,524 | 790 |
| All Controls, Village and Year FE | Yes | Yes | Yes |

**Table A9**
Effects of women's decision making and AGE on the share of school expenditure per child in the household.

| Variables | (1)<br>All Children | (2)<br>Primary Children | (3)<br>Secondary Children |
|---|---|---|---|
| Girl | −0.143*** | −0.165*** | −0.0197 |
|  | (0.031) | (0.046) | (0.085) |
| AGE | −0.0080 | −0.0231 | −0.0789* |
|  | (0.020) | (0.025) | (0.043) |
| Woman Decides | −0.111 | 0.0268 | −0.0477 |
|  | (0.105) | (0.051) | (0.066) |
| *Woman Decides * Girl* | *0.194* | *−0.065* | *0.258** |
|  | *(0.143)* | *(0.119)* | *(0.144)* |
| *AGE * Girl* | *0.0209* | *0.105*** | *−0.120* |
|  | *(0.0302)* | *(0.0413)* | *(0.0960)* |
| *Girl * Decide * AGE* | *0.0968* | *−0.039* | *−0.043* |
|  | *(0.156)* | *(0.130)* | *(0.174)* |
| Selection Equation |  |  |  |
| Girl | −0.559*** | −0.514*** | −0.644*** |
|  | (0.0841) | (0.118) | (0.140) |
| Distance to Girls' Primary School | −0.0357** | −0.0255 | −0.0456 |
|  | (0.0172) | (0.0225) | (0.0379) |
| Distance to Boy's Primary School | 0.0247 | 0.00784 | 0.0672 |
|  | (0.0180) | (0.0275) | (0.0622) |
| Distance to Boys' Secondary School | −0.0217 |  | −0.0261 |
|  | (0.0149) |  | (0.0182) |
| Distance to Girls' Secondary School | −0.0260*** |  | −0.0228 |
|  | (0.00902) |  | (0.0152) |
| AGE | 0.382*** | 0.114 | 0.373*** |
|  | (0.0853) | (0.122) | (0.121) |
| Woman Decides | 0.275 | 0.820** | −0.159 |
|  | (0.265) | (0.386) | (0.267) |
| *Woman Decides * Girl* | *−0.0736* | *−1.025** | *0.498* |
|  | *(0.420)* | *(0.524)* | *(0.670)* |
| *AGE * Girl* | *0.0704* | *0.190* | *0.0698* |
|  | *(0.0974)* | *(0.144)* | *(0.157)* |
| *Girl * Decide * AGE* | *0.229* | *1.199** | *−0.434* |
|  | *(0.396)* | *(0.639)* | *(0.634)* |
| Constant | 0.546 | −2.108*** | 1.399** |
|  | (0.398) | (0.589) | (0.657) |
| athrho |  |  |  |
| Constant | 0.444*** | 0.549 | −0.580** |
|  | (0.134) | (0.647) | (0.243) |
| lnsigma |  |  |  |
| Observations | 5,562 | 2,225 | 1,818 |

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