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Female Household-Headship in Rural Bangladesh: Incidence, Determinants and Impact on Children's Schooling

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Abstract

This paper uses data from Matlab, Bangladesh to examine the characteristics of female-headed households and estimate the impact of female-headship on children's schooling. Female household-heads in Matlab fall into two broad groups: widows and married women, most of whom are wives of migrants. These women differ from each other not only in their current socio-economic circumstances, but also in their backgrounds and circumstances prior to getting married. To identify the effects of female-headship on children's outcomes, I use a two-stage least squares strategy that controls for the possible endogeneity of both types of female-headship. Results indicate that children residing in households headed by married women have stronger schooling attainments than children in other households, while children of widows are more likely to work outside the home. The hypothesis of exogeneity of female-headship is rejected in most cases.

Keywords: Female-headed Households, Widowhood, Migration, Schooling

JEL Codes: J12, J13, J16, I21, O15

1 Introduction

It is well-documented that women almost everywhere are disadvantaged relative to men in their access to assets, credit, employment, and education. Consequently, it is often suspected that female-headed households are poorer than male-headed households, and are less able to invest in the health and education of their children (Folbre, 1991; UNDP, 1995; United Nations, 1996; World Bank, 2001).

Though numerous case studies confirm these claims (Mencher and Okongwu, 1993; Kumari, 1989), the empirical evidence is far from conclusive. Buvinic and Gupta (1997) for example, review 61 studies on headship and poverty and find female-headed households to be disproportionately represented among the poor in 38 cases. In a similar study however, Quisumbing, Haddad and Pena (2001) find that the relationship between female headship and poverty is strong in only two out of ten countries in their sample (Ghana and Bangladesh).

The empirical evidence on the adverse impact of female-headship on children's welfare also lacks consensus. Several studies using data from the United States and Latin America have indeed found that children from female-headed households experience lower educational and occupational attainment, and in some countries, higher risks of teenage parenthood.[1] Other studies however, argue that these apparent correlations arise due to pre-existing disadvantages of families and are thus not causal in any way (Painter and Levine, 2000). Furthermore, evidence from several developing countries in Africa and Asia suggest that children from female-headed households may have higher schooling attainment than children from male-headed households (Lloyd and Blanc, 1996; Pong, 1996; Kennedy and Peters, 1992).[2]

There are several possible reasons for the lack of consensus in this literature. First, there are difficulties in defining female headship: definitions of headship employed in national surveys, the criteria used by survey respondents on the field, and the definitions based on contributions to household income do not always coincide (Rosenhouse, 1989; Kennedy and Peters, 1992; Kennedy and Haddad, 1994; Handa, 1996). Second, most analyses of female headship do not take into account the heterogeneity *within* the group of female household heads (exceptions are Rosenhouse, 1989; Kennedy and Haddad, 1992; Handa, 1994; Handa, 1996; Dreze and Srinivasan, 1998). Typically, the group includes widows, divorced women, single women, abandoned women

[1] McLanahan and Sandefur (1994) and Seltzer (1994) provide a comprehensive review of evidence from the US, Barros, Fox and Mendonca (1995) provide evidence from Brazil.

[2] In their sample of seven African countries, Lloyd and Blanc (1996) find that though female headed households are economically disadvantaged relative to male-headed households, children in these households are more likely to have attended school and completed grade 4 than children in male-headed households. In Cameroon, for example, 81 percent of children in female-headed households complete fourth grade by age 14, compared to 60 percent of children in male-headed households of like income. Kennedy and Peters (1992) find that in Kenya and Malawi, though female-headed households are in the lowest income group, the nutrition status of pre-school children in these households was significantly higher than in any other type of household. Similarly, in Malaysia, Pong (1996) finds that children of widowed mothers have similar school participation rates as children of two-parent families.

and women whose husbands have migrated away in search of employment. Some women in this group are clearly more vulnerable to falling into poverty than others. Moreover, the percentage of women in each group differs across countries, cultures and regions of the world, and also across time.

Finally, even studies that address the issue of heterogeneity typically assume away the possibility that household structure and children's schooling outcome are jointly determined by an unobserved process, and that consequently female-headship may be endogenous to decisions regarding investments in children (Handa, 1996). It is therefore unclear whether the correlations between female-headship and poverty are actually causal, or whether this relationship is driven by the pre-existing disadvantages of women who become female-heads and whose children receive less investments. A growing literature suggests that ignoring this source of endogeneity can lead to biased empirical estimates of the effects of household structure on children's schooling (Manksi, McLanahan, Sandefur and Powers, 1992; Foster, 1993; Handa, 1996; Foster, 1998; Painter and Levine, 2000; Foster and Rosenzweig, 2001; Joshi and Sinha, 2003).

This paper is intended as a modest step in the direction of addressing some of these issues. Using data from rural Bangladesh, I examine the incidence of female-headship, the characteristics of female-headed households and the impact of female-headship on children's educational outcomes. Two contributions are made to the general literature on female-headed households: First, I show that even in rural Bangladesh, where numerous case-studies, international comparisons, and analyses of household surveys have pointed out that female-headed households are in general among the poorest and most vulnerable (Cain, Khanam and Nahar, 1979; Caldwell, Reddy and Caldwell, 1984; Islam, 1993; Amin, 1996; Buvinic and Gupta, 1997; Rahman, 1998; Quisumbing, Haddad and Pena, 2001), they are actually quite a diverse group. In particular, there appear to be two main types of female household-heads in rural Bangladesh: (1) widows, and (2) married women, most of whom are the wives of migrants. These two types of female-heads differ not only in their income, ownership of assets and children's outcomes, but also in their socio-economic backgrounds prior to marriage. Compared to the wives of male heads, widows are less likely to have brought dowries to their husband's families, more likely to have lost their father and/or mother before their marriage, had fewer brothers, and come from poorer families than the families they married into. The comparisons for married women who head their own households are almost exactly the opposite: these women are more likely to have brought dowries into the homes of their husbands, more likely to have a living father and mother at the time of their marriage, have more brothers, and come from wealthier families than the families they married into. This is an important finding for it suggests that observed correlations between female-headship and measures of poverty may not in fact be causal.

The second contribution of this paper is to estimate the effect of female headship on children's educational

attainment while treating female-headship as an endogenous variable. Results from the two-stage-least-squares estimation strategy show that residing in a household headed by a widow increases the likelihood of working outside the home by 93%, but has no statistically significant impact on any measure of children's schooling attainment. Residing in a household headed by a married woman however, has a very different effects: children residing in households headed by married women are 12% less likely to work outside the home, 19% more likely to have ever attended school, 8% more likely to be currently enrolled in school and 41% more likely to have finished at least two or more years of school (though the first result is not statistically significant). The hypothesis of exogeneity of both types of female-headship is rejected in most cases.

The remainder of this paper is organized as follows: Section 2 describes the theoretical model that motivates the empirical investigations of the effects of female-headship on children's education. Section 3 describes the dataset that is used in this paper. Section 4 analyzes the incidence of female-headship and the types of female-headed households in the data. Section 5 compares the socio-economic status of male- and female-headed households. Section 6 analyzes the causes of female-headship and compares the past choices of women who reside in female-headed households. Several issues are examined: (a) the differences in marriage-market options between widows who head their households, married women who head their households and wives of male heads; (b) the incidence of remarriage; (c) patterns of migration, motivations for migration, and differences between migrants who migrate alone versus with their families. Section 7 contains an econometric analysis of the effects of female headship on children's educational outcomes. Section 8 concludes.

2 Theoretical Framework

Following the approach of Schultz (1960, 1963) Becker (1962, 1981) and Becker and Tomes (1979), I view children's schooling attainment as a household-level decision that depends on the costs and benefits of education and estimate reduced form equations. These models generally assume (1) financial markets are perfect; (2) parents are altruistic; (3) schooling is valued solely for its contribution to future income; (4) parents care equally about each child and pay for education based solely on education's effects on future productivity. Parents typically maximize a single utility function in which utility depends on the number of children, own consumption, and the future income of the children.

Becker (1962, 1981) and Becker and Tomes (1979) showed that if capital markets are perfect, altruistic parents borrow to maximize the net incomes (earnings less debt) of children. In this case, the marginal rate of return on human capital is equal to the interest rate, and that parent's income does not have any bearing on

the levels of schooling attained by children. In the context of rural Bangladesh howevever, it is unrealistic to assume that financial markets in rural Bangladesh are perfect. In this scenario, Becker (1962, 1981) and Becker and Tomes (1979) showed that parents may need to either foresake own consumption, liquidate some assets, or choose among children. Moreover, expenditures on children's education will depend not only on the children's endowments and public expenditure, but also on parental income, parental preferences for child schooling and the abilities of their children. For a child i, born in household h and village v, the reduced form equations that emerge from these models take the following form:

$$s_{ihv} = f(c_i, x_h, q_v, p) \tag{1}$$

where

s_{ihv}:	the schooling outcome for a child i, born in household h and village v,
c_i:	vector of characteristics of child i,
x_h:	vector of characteristics of household h,
q_v:	vector of characteristics of village v
p:	vector of prices and wages that proxy for expected future earnings and opportunity costs

In this model, the unforeseen death of a parent, or the decision of one parent to migrate away from the household should have no effect on children's education *unless* parental absence affect the value of a child's schooling, or the opportunity cost of children's time.[3] Yet, there are reasons to take these effects seriously in rural Bangladesh. Since insurance markets and social security programs are almost non-existent, and since women's access to labor markets are very limited, the trade-offs between child-labor and schooling can be particularly significant for the children of widows and migrants with unstable incomes (Cain, 1981; Amin, 1996). Moreover, as will be seen in the next section, the demographic composition and socio-economic characteristics of these households are very different than households headed by men. I thus include two measures of household structure as explanatory variables in Equation 1:

$$s_{ihvt} = f(c_i, x_h, q_v, \mathrm{WHH_h}, \mathrm{MWHH}_h) \tag{2}$$

where $\mathrm{WHH_h}$ and MWHH_h are each dummy variables that take value 1 if the household is a household headed by a widow or a married woman respectively, and 0 otherwise. p was dropped because it was unlikely to vary across the area where the data was collected.

[3]Children's schooling may also be affected if a household's access to credit, opportunities to avail of government programs, and expectations of future earnings was to change as a result of the death/migration of a parent.

3 Data

The data used in this paper come from the 1996 Matlab Health and Socio-economic Survey (MHSS) together with census data from the Matlab Demographic Surveillance System (DSS).[4] Matlab is an Upazila (subdistrict) of Chandpur district, which is about 50 miles South of Dhaka, the capital of Bangladesh. The MHSS covers 141 villages, where the International Centre for Diarroreal Disease Research, Bangladesh, has been maintaining its Demographic Surveillance System (DSS) since 1966. For a small portion of the analysis in this paper, I also use climate data on annual rainfall levels in the Matlab area for the period 1950-1996.[5]

Matlab is a densely populated, low-lying deltaic plain intersected by a network of tidal rivers, and canals. The climate is sub-tropical with three seasons: monsoon, cool-dry and hot-dry. The average rainfall of 2159 mm is concentrated in the monsoon season which extends from June through September. The Tropic of Cancer passes through the area. Through the rainy season, much of the region is often submerged under water and transportation is often possible only by boat. Eighty-five per cent of the people in the area are Muslims and the remaining are Hindus. Although farming is the main occupation, 30 per cent of the families lack arable land. For these households fishing, share-cropping and wage-labor are major sources of livelihood. The per-capita income of the households is about US $150 a year (Razzaque and Streatfield, 2001).

The 1974 census consisted of 167,037 individuals in 28,608 households in 233 villages. The 1982 census consisted of 186,695 individuals, in 27,515 households in the same 233 villages as the 1974.[6] The 1996 MHSS contains information on 4,364 households clustered in 2,687 *baris*.[7] For each of the baris, one household was chosen at random. For the selected households that had more than one household (i.e. 2,067 baris), a second household was also selected.[8]

[4]The MHSS is a collaborative effort of RAND, the Harvard School of Public Health, the University of Pennsylvania, the University of Colorado at Boulder, Brown University, Mitra and Associates and the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B). It was primarily funded by the National Institute on Aging with some additional support from the National Institute on Child Health and Development. The DSS is organized by the ICDDR,B and has been present in this region since 1966.

[5]This data, the "University of Delaware Air and Temperature Precipitation Data" are provided by the NOAA-CIRES Climate Diagnostics Center, Boulder, Colorado, USA, from their Web site at http://www.cdc.noaa.gov/.

[6]The region is thus densely populated: villages in Matlab have an average population of about 1,100 persons, and the average population density exceeds 1500 per square mile (Fauveau, 1993).

[7]The *bari* is the basic unit of social organization in Matlab (Cain, Khanam and Nahar, 1979; Caldwell, Reddy and Caldwell, 1984; Foster, 1993; Fauveau, 1994). *Bari* literally means "homestead", but commonly refers to a cluster of households in close physical proximity. The households are generally located around a common yard and may share resources such as a tube-well, a cowshed, latrine, and/or several jointly owned trees. Heads of the households on a bari are generally related.

[8]For baris with exactly two households, the second household was automatically chosen as a second pick household. For baris with greater than two households, the second household was selected from the bari in order of preference as follows: (1) The household of the father and/or mother of the head of the first sampled household; (2) A household containing the son of the head of the first sampled household–if there were more than one household in the bari containing a son, one was picked at random; (3) A household containing a brother of the head of the first sampled household–if there was more than one household containing a brother, one was picked at random; (4) If none of the above three categories of households were found a household was selected at

Both the census datasets contain information on household size and structure, household assets, living arrangements, disability status, and the educational level of each member of the household. These records can be linked for the period of 1974–1982, so that all events occurring to a single individual are available and organized by household residence in 1974. The MHSS is a very rich dataset, containing information on both householder and non-householder family members, education histories (including the age at which schooling began, the school drop out age, grades attended and grades completed, grade repetition and scores in secondary and higher secondary examinations), marital histories, household formation, household income and consumption and a variety of other socio-economic ariables.

4 The Incidence of Female-Headship: Broad Patterns and Trends

Previous analyses of the incidence of female-headship in Bangladesh, have suggested several patterns. First, the incidence of female-headship is low by international standards (Buvinic and Gupta, 1997). Second, due to strong cultural norms of patriarchy, and marital systems that limit women's autonomy in the homes of their husbands, female-headed households in this region are generally "male-absent households", or households where the male-head has died, migrated or been enfeebled due to illness (Cain, Khanam and Nahar, 1979; Islam, 1993; Amin, 1997; Mannan, 2003). Third, there is also some limited evidence that the number of female-headed households has been increasing over time. It is often argued that problems of growing landlessness, and the disruption of traditional systems of family governance have led to an increase in the number of women who are abandoned and forced to fend for themselves (Fauveau, 1993; Islam, 1993; Amin, 1997).

The numbers from the MHSS corroborate these claims. The number of female-headed households in Matlab for the years 1974, 1982 and 1996 is presented in Table 1. Note that the number of female-headed households has been increasing over time: their representation in the total sample of households increased from 11.68% in 1974 to 12.9% in 1982 to 15.2% in 1996. Note also that the proportion of female-heads who are widows increases at a slower rate that the proportion of female-headed households more generally. This may indeed indicate an increase in the number of abandoned women (this is difficult to confirm for most female-heads in this situation still report themselves as married).

It is worth emphasizing that the estimates in Table 1 are based on self-reported headship measures. Several recent studies have criticized the use of self-reported headship measures in empirical analyses of survey data (Rosenhouse, 1989; Kennedy and Peters, 1992; Handa, 1994, Quisumbing, Pena and Haddad, 2001). The main

random from the bari.

criticism is that where households are identified as female-headed only when the demographic head (a male) has either deceased or has migrated away, male-headed households where the woman is the main contributor to household income are misclassified. This criticism however, is perhaps less important in rural Bangladesh than in many other cultures around the world. Strong norms of patriarchy, one of the lowest female-labor force participation rates in the world, the prevalence of the *purdah system*, and well-defined cultural norms regarding household headship limit the control women have over their incomes (Caldwell, 1978; Cain, Khanam and Nahar, 1979; Abdullah and Zeidenstein, 1982; Amin, 1996).[9] Thus even where women contribute the most to household income (424 households of 3649 male-headed households) it is very likely that the power of decision-making continues to reside with the (male) demographic head. Thus, for the purpose of this paper, male-headed households that appear to be "female-maintained" remain classified as male-headed.

Transitions from female-headed households back to male-headed households also appear to occur. For households in the MHSS that were also present in the 1982 and 1974 census surveys, Figure 1 presents the transitions in and out of female-headed households. Note that of the 379 households that were female-headed households in 1982, 325 households (85.7%) had become male-headed by 1996. Of the 288 female headed households in the 1974 census, 124 became male-headed (43%) by 1982. These numbers suggest that each year, on average, somewhere between 5 and 6% of female-headed households become male-headed households.

These transitions are generally driven by the change in a woman's status from household head to mother of the head. This pattern is also apparent when we take a closer look at retrospective information on household formation for women who have been ever-widowed. 1094 of the 11033 women who were interviewed in the MHSS reported that they had been widowed at least once in their lives. Of these women, 799 were living with their adult children.[10] 549 of these 799 women were also interviewed in the 1982 census. At that time, 517 (94.17%) women were heading their own households. Thus, in the sample considered here, most widow headed households in 1982 had become male-headed by 1996.

In general, the data indicate that there are two main categories of female-headed households: widows and married women whose husbands are residing elsewhere. To ensure accurate comparisons of household-types, the following reclassifications were also made: (1) Male-headed households in which a widowed woman resides with a son who is either unmarried or under the age of 25, were reclassified as widow-headed households (there were 43 such households); (2) Male-headed households in which the wife of a migrant resides with a son who is either unmarried or under the age of 25, were reclassified as households headed by migrant's wives (there were

[9]The term *purdah* refers to the broad set of norms that emphasize the seclusion of the sexes, allocate the control of resources to men, and confer status to women based on their relationships with men (Abdullah and Zeidenstein, 1982; Amin, 1996).

[10]Of these women, 462 (42.23%) were living with their sons, and 337 (30.8%) were living with their daughters.

7 such households); (3) Women in the sample who were divorced/separated were reclassified as widow headed households (there were 24 such women).[11]

Evidence from other parts of the world has illustrated that Widow-Headed-Households (WHH) and Married-Woman-Headed-Households (MWHH) are quite different (Buvinic and Gupta, 1996; Kennedy and Haddad, 1994; Kennedy and Peters, 1992; Rosenhouse, 1989). Widows who head their own households are likely to be *de-jure* heads, i.e. women who are the legal and customary heads of their own households who have full control over household income and expenditures. Married women who head their households in the absence of their husbands on the other hand, are generally *de-facto* heads. In these households, husbands or other male-relatives possibly still play a role in basic decision-making and make varying contributions to household incomes.

5 Present Circumstances of Male and Female-Headed Households

5.1 Demographic Composition

The demographic composition of households in Bangladesh is determined by the household's position in its life-cycle. For most households, this cycle begins when patriarchal authority is assumed by a male member of the household, and ends when the patriarch dies or his adult married sons establish their own households (Cain, Khanam and Nahar, 1979; Foster, 1993; Amin, 1997). "Joint" families, consisting of two or more generations of family members, who eat together, hold property in common and make joint-decisions on several matters, are common. As a result, many households are composed of more than two adults and their children.

Female-headed households are generally formed in the event of the disruption of the standard life-cycle. As a result, their demographic composition is likely to be different than households headed by men. Besides lacking an adult male, they are also less likely to contain members of the patriarchal extended family and are more likely to have higher dependency ratios (i.e. ratio of non-earning members to earning members).

Table 3 summarizes the composition of households in the 1974, 1982 and 1996 data. Note that female-headed households are indeed substantially smaller: there are fewer men, women, girls and boys in these households. This is consistent with the findings of numerous other studies in many different parts of the world (Dreze and Srinivasan, 1993; Kennedy and Peters, 1992; Handa, 1994; Lanjouw and Ravallion, 1995; Lloyd and Blanc, 1995).

[11] Since the number of divorced/separated is a small fraction of the total number of widows, I will continue to refer to the group of both these women as "widow-headed households". The results of this paper remain qualitatively the same if we drop these households from the analysis.

5.2 Income and Assets

Since female-headed households in Bangladesh are generally "male-absent households" and since women in Bangladesh have lower literacy rates, educational attainment, asset holdings, and access to credit, and higher levels of malnutrition, morbidity and risks of mortality compared to men (World Bank, 2001), female-headed households are likely to have lower levels of income and a weaker asset-base than male-headed households. Indeed, this is an argument that is commonly found in the policy literature (Mannan, 1993).

The income levels, income sources and asset-holdings of male and female-headed households in the MHSS are summarized in Table 4. Notice that contrary to the intuition outlined above, MWHH have highest levels of income (though most of this comes from remittances directly received by household head). WHH on the other hand, have lowest levels of income (though the result is not statistically significant). That female-headed households are not significantly poorer with respect to per-capita income is an observation that has been made previously in South Asia. Dreze and Srinivasan (1995) for example, use NSS data from rural India to compare the household per-capita expenditures of male and female headed households. They find that unless a suitable equivalence scale is employed for the purpose of such comparisons, there is no evidence that female-headed households are poorer than male-headed households.

The disadvantages of female-headed households are however, more apparent when we consider asset holdings and other measures of permanent income. Note that both MWFH and WHH are less likely than MHH to own farmland and homestead land and are more likely to have dirt-floors. WHH are less likely own jewelry and assets such as a clock, radio or a television. MWHH on the other hand, are more likely to own these items, and the differences are statistically significant. That widows and other female heads have a poorer resource base than their counterparts in male-headed households has been documented elsewhere (Kumari, 1989; Islam, 1993, Mannan, 2003). Similarly, the finding that married female heads (and in particular, wives of migrants) have a stronger asset base is seen in other studies. Kennedy and Peters (1992) find that migrant households in Malawi actually have higher per-capita expenditures and holdings of assets than any other type of household.

The difference between the asset holdings of male and female-headed households is possibly driven by differences in patterns of inheritance between men and women in rural Bangladesh. Though Islamic law permits women to inherit assets from deceased relatives, in practice, women often forfeit their claims to their inheritances in return for the goodwill of their brothers and other male-relatives. Of all the 665 widows for whom inheritance information was available in the MHSS, only 219 women (32.9%) reported that they had inherited property from deceased relatives. Of the 3699 male heads however, 1557 (42.1%) had inherited property from

deceased relatives.

5.3 Expenditure

The differences seen between the income and asset holdings of the three types of household are mostly absent in comparisons of per-capita expenditure. Table 5 contains a description of the expenditure patterns of the three household types. Note that in most cases, the differences in expenditures of the three types of households are not statistically significant. MWHH however, seem to spend more in certain categories (food, clothing and education).

Why might it be that the differences seen in the incomes and assets of the three types of households are not reflected in the patterns of consumption? The explanation for this is that a greater share of their expenditure is met by other households. Moreover, women from poorer households are likely to engage in more cost-cutting or expenditure-saving activities than their married woman counterparts (Amin,1997).[12]

The finding that female-headed households have lower incomes but not lower consumption levels than male-headed households is consistent with numerous other studies. Dreze and Srinivasan (1995) for example, use NSS data from rural India to compare the equivalence-scale adjusted household per-capita expenditures of male and female-headed households. They find that unless they correct for economies of scale, there is no evidence that female-headed households are poorer. They find that even relatively small economies of scale imply that the incidence of poverty among certain types of female-headed household (single widows, widows living with unmarried children, and female household heads) is higher than in the population as a whole. In results not shown here, I find similar results in the current dataset.

5.4 Investments in Children

These differences between the three types of households also extend to children's educational outcomes. Table 5 contains information on the educational attainments of children from the three types of households. Notice that compared to children from male-headed households children from WHH are: (1) more likely to perform paid and unpaid labor outside the home; (2) less likely to have ever attended school or be currently enrolled in school; and (3) less likely to have completed two years of primary school (grades 1–2). Children from MWHH, on the other hand show the opposite pattern. They are less likely to perform paid and unpaid labor outside the

[12]Amin (1996) provides plenty examples of this. For example, she points out that rather than buying vegetables and fish from the local market, poorer women will pick greens these from around the homestead and catch fish in flooded fields. Similarly, they save fuel expenses by foraging through the village for straw, wood and dung, which they then bring home to dry.

home, more likely to have ever attended school or be currently enrolled in school, more likely to have completed both two years of primary school (grades 1–2), primary school (grades 1–5), junior secondary school (grades 5–7) and secondary school (grades 5–10). In all cases, the results are statistically significant at the 1% level. Understanding these differnces will be the subject of the empirical analysis further on in this paper.

In general, the information on demographic composition, income, assets, expenditure patterns seem to suggest that female-headed households in Matlab are quite heterogeneous. Whereas households headed by widows are worse-off when compared to households headed by men, households headed by married women are often substantially better-off. It is unclear however, whether these apparent correlations are in any way causal. More specifically, it is unclear whether the differences between the two types of female-headed households are due to the circumstances that drove them into female-headship, or are due to pre-existing differences that were manifested even before the households became female-headed. To examine this issue, it is necessary to look at the functioning of marriage markets and patterns of migration in the Matlab area. These are examined the following section.

6 Past Choices of Women in Male- and Female-Headed Housholds

Bangladesh is a patriarchal society. Decent is patrilineal, residence is patrilocal and marriage is close to universal (Cain, Khanam and Nahar, 1979; Dyson and Moore, 1983; Caldwell, 1978; Amin, 1996). Though Muslim law permits polygamy under certain circumstances, and also permits marriages between cousins, marriages in rural Bangladesh are mostly monogamous and between individuals who are unrelated.[13]

Marriages are typically arranged by members of the senior-most generation of a family. In the MHSS survey, 76% of marriages were arranged by parents of the bride and groom. Others were arranged by other relatives in the patriline (17%), or in a small number of cases, the bride and groom themselves (7%). A bride whose mother and/or father are deceased at the time of her marriage generally faces more limited options to marry. A simple comparison of the circumstances of wives of male-heads, WHH and MWHH indicate that relative to the wives of male-heads, WHH are more likely to have had a deceased parent at the time of their marriage, and MWHH are less likely to have had a deceased parent at the time of their marriage (Table 7).

There is a strong preference for early marriage for men and even earlier for women. The mean age of marriage in the current sample is 11.36 for women and 23.7 for men.[14] At the time of marriage, a woman

[13] Amongst all male respondents in the MHSS, only 2.3% of men report having more than one wife.

[14] In the sample of both male and female respondents, 80.3% marriages appeared to be between individuals who are unrelated.

migrates from her natal home to live in the home of her husband. In the current sample, women's travel times to their natal homes were on average 2.3 hours.[15] In the MHSS sample, it appears that WHH married roughly 1.2 years earlier than average, and MWHH married roughly 1.6 years later than average (Table 7). This is possibly driven by the different characteristics of these women and the households they are raised in: married female-heads were more likely to have attended school, belonged to landed homes, and had parents who were wealthier than their parents-in-law (Table 7). Women who were widowed however, were less likely to have attended school, more likely to have belonged to landless homes and more likely to have had fathers who were poorer than their fathers-in-law (Table 7).

As is typical of most monogamous virilocal societies with high levels of inequality, marriages involve payments of dowry, or husband-price (Anderson, 2000; Caldwell, Reddy and Caldwell, 1983; Lindenbaum, 1981). The custom of dowry prevails over much of India, Pakistan and Bangladesh and has been widely studied. It consists of wealth transferred to the groom and his parents from the parents of the bride at the time of marriage.[16] Dowries may take the form of assets given directly to the bride to take to her new home (such as jewelry, utensils, furniture, etc.) or assets given directly to her in-laws (such as land, furniture for the home, or other assets that can be used by the household). The amount of the dowry is generally increasing the "desirable" qualities of the groom, which are generally age, education, landholdings, family background, etc. (Anderson, 2000; Caldwell, Reddy and Caldwell, 1983; Lindenbaum, 1983).

A comparison of the dowry-histories of WHH and MWHH reveals some striking differences between these women: Widows heading their own households were on average, 16% less likely to have brought a dowry into their in-laws home at the time of marriage (Table 7). This is a clear indicator that the "quality" the match between the widow and her late-husband was considered unfavorable even at the time that the marriage contract was negotiated. Married women who head their own households on the other hand, were 5.6% more likely to have paid a dowry, again indicating that the match was considered "good" even at the time that the marriage contract was signed. This is a striking find.

The practice of dowry can affect a woman's chances of finding a match of good quality in the marriage market in indirect ways as well (Fricke, Syed and Smith, 1986). In particular, in settings where individuals are

[15]Women who married at young ages however, appeared to wait for a period of several years before they migrated to their husbands home. In the MHSS sample, women who married younger than 13 appeared to wait an average of 3.9 years. This "two-stage" marriage process is very common in South Asia (Bloom and Reddy, 1986; Fricke, Syed, and Smith, 1986).

[16]The practice of providing dowries has been adopted in Bangladesh is only recent times (Caldwell, Reddy and Caldwell, 1982; Lindenbaum, 1981). Traditionally, Bangladeshi households paid gold jewelry to the bride and a sum of money to the bride's father (khailoti or bride-price). Additionally, in accordance with Islamic law, the marriage document (kabin) specified the payment to the family of the bride in the event of divorce (mehr). In recent years however, a shortage of "eligible" males has resulted in the reversal of these patterns: bride-price has been replaced by dowry and mehr is seldom paid in the event of divorce (Lindenbaum, 1981).

unable to borrow to finance the provision of a dowry, the sex-ratio of a group of siblings may further limit a family's ability to provide a dowry for their daughter. A household containing more male-children than female-children will in general experience more dowry inflows than dowry outflows, whereas a household containing more female children than male children will have to spend more on dowries than it will receive. As a result, parents in such households may be unable to make high dowry payments and may have to compromise on the quality of a match that they will find their daughters. The differences in the demographic composition of WHH, MWHH and MHH are presented in Table 7: WHH in general had fewer-than-average brothers and smaller sibling sex-ratios (the ratio of male-siblings to female-siblings). The results for married female-heads are exactly the opposite: they appear to have a higher-than-average number of brothers and sibling sex-ratios in their homes that are skewed towards more male-children than female-children.

6.1 Options for Remarriage

Despite the fact that Islamic law permits divorce and also permits remarriage for divorcees, widows and widowers, in reality these laws seem to apply more for men than women. In the MHSS, more men than women report that they have been married more than once: 14.7% of men and 7.5% of women report that they have been married more than once.[17] Recall from the section above that among ever-widowed women in the sample, only those women who were very young at the time that they were widowed appeared to remarry.

This pattern of low rates of remarriage for women is also seen in a close examination of the living-situation of ever-widowed women. Of the 1094 women who were ever-widowed, 218 reported that they had remarried (19.2%) after the loss of their first husband. All of these women however, were under the age of 20 at the time of their second marriage. None of them had headed their own households after the death of their husbands. It appears that they returned to their natal homes where their parents arranged a second marriage.[18]

6.2 The Circumstances of Migrants

Migration, both temporary as well as long-term, is common in the Matlab area. Proximity to Dhaka city, a high frequency of floods and natural disasters, and the growing problem of landlessness has increased the pressure on young males to migrate in search of employment. 29.47% of adult males reported that they have migrated for a period of six months or more at least once in their life: 53.82% had migrated exactly once, 31.92% had

[17]The most common reasons for remarriage included dowry non-payment issues, disputes with in-laws, "bad character" of either the bride or groom and the inability to bear children.

[18]The average age at the time of second marriage for women in this group was 13.2, and the standard deviation of the age at second marriage was 3.3.

migrated exactly twice, and the remainder had migrated more than twice. For men, the age of first migration is 25.61.[19] Most migrants move to locations where they already have friends or family. Table 8 shows that more than half of the migrants reported having either friends of family in the new location. What is particularly striking is that around half of all migrants are married when they migrate, but they do not always take their families with them. Migrants appear to be more likely to move with their families when they have a brother in the new location (Table 8).

Reasons for migration included economic factors (33.3% of migrants), loss of land due to river erosion (24.3%), dissatisfaction with place of residence (10.1% of migrants), educational opportunity (5.2% of migrants), family related issues (5.3% of migrants), and political factors (2.3% of migrants).[20] The precise economic reasons for migration are reported in Table 8. Most migrations took place to other villages or small towns. 23% of migrations were to big cities or to other countries (which were generally India or the Middle East).

Families who are "left-behind" after the head of the household migrates either head their own households (roughly 50% of the wives of migrants), continue to reside in the homes of their in-laws, or migrate back to their natal homes. Table 9 presents the numbers of women in each category. Note that wives of migrants who head their own households are the largest group.

Appendix 1 to this paper contains a more detailed analysis of the determinants of widowhood and migration in the MHSS sample (Table 1). It is interesting to note that regressions in which widowhood is regressed on a woman's age at marriage, her husband's age at marriage, characteristics of her parent's household, her dowry payments and various marriage market variables can explain around 28% of the total variation in WHH and 31% of the variation in MWHH.

7 The Effects of Female Headship on Children's Education: Empirical Analysis

The goal of this section to examine the impact of both types of female headship on children's education. The working sample includes households where children of the household head are between the ages of 8 and 18 at the time of the MHSS.[21] This included both young adults living with their parents as well as young adults who

[19] The standard deviation of the age of first migration is 14.62. These responses are based on the answers to the questions: "How old were you when you moved from place X to place Y?", where X is the previous location and Y is the new location.

[20] Other reasons were a shortage of homestead land in the previous place of residence, illness of relatives residing elsewhere, the provision of medical treatment for an ill family-member, and so on.

[21] Children for whom neither parent was the head were excluded because detailed information about the income and other characteristics of the child's parents was often unavailable. Also, information on how long the child had been living in the household

had left the household and were living elsewhere.

The reason for setting the lower age limit at 8 is twofold. First, since the average age at which children begin their schooling is 7 (see Table 10), we include all the children who are above the average school starting age. Second, boys and girls between the ages of 8 and 18 are likely to have been significantly affected by several government policies that were aimed at increasing schooling enrollment and schooling attainment (these are described in the following section) during the time of the survey.[22] Choosing a lower age limit that exceeded the age of 8 would cause us to omit a very interesting and important group of children.

The reason for setting the upper age limit at 18 is three-fold. First, the older the individual, the more likely that the he or she is to make recollection errors about the circumstances in which the schooling decisions were made. Secondly, information on variables such as female headship, income and assets are relevant to the schooling decisions of only those children who are either in school or have recently quit. For older individuals it would be problematic to use current information as a proxy for information at the time that schooling decisions were being made. Third, as in the case of the choice of the lower age limit, I would like to make the present analysis relevant to the current situation in Bangladesh and not an analysis of earlier cohorts of individuals.

7.1 Dependent Variables and Control Variables

The dependent variables in the children's schooling equation are as follows: (1) a dummy variable indicating whether or not the child works (*CurrWorks*);[23] (2) a dummay variable indicating whether the child has ever attended school (*EverAttd*);[24] (3) a dummy variable indicating whether a child is currently enrolled in a government school (*CurrEnrolled*); (4) a dummy variable indicating whether the child completed two years of primary school (*TwoYrsPrimSch*).[25]

Several different control measures were included in the analysis. Measures of individual characteristics

and how long the child would continue to live in the household was unavailable.

[22]Examples include the Food-for Education program, which provides 15 kg of wheat to the parents of poor children aged 6–10 provided these children attend school 85% of the school year, and the secondary-school scholarship program for girls, which provides monthly stipends to girls enrolled in grades between 6 and 9, provided they attend 65% of the school year and attain a passing grade. Though we do not know which MHSS households were eligible for these schemes and which schools implemented them accurately, the high enrollment rates in 1996 suggest that at least some households were benefitting from the policy measures.

[23]This variable takes a value of 1 if either the child earns wages, and/or participates in agricultural or non-agricultural activities outside the house, regardless of whether he/she is paid for these activities, and 0 otherwise.

[24]This variable takes value 1 if the child reports he/she has ever attended school, even if he/she never completed a single grade, and 0 otherwise.

[25]Note that these variables do not capture any aspect of the intensity of schooling, the quality of schooling, or a child's cognitive development in school. Though the MHSS included questions on these variables, the questions were limited to individuals who were actually interviewed at the time of the survey. To use this information, I constructed a different sample of children and ran several more regressions. Results are discussed further in this section and are presented more formally, in the Appendix 2 of this paper.

included age (*Age*), age-squared (*AgeSq*) and gender(*Female*).[26] Among the variables on parental characteristics, variables indicating whether the child's mother had ever attended school (*EverAttdMo*) and the number of years of education of the child's father (*YearsEdFa*) and the mother's age (*MotherAge*) were included. Also included were the sex-ratio of the mother's siblings (*MotherSibSexRatio*) and a dummy variable indicating whether the mother brought a dowry into her husband's home at the time of her marriage (*Dowry*). These were intended to proxy for the mother's autonomy and decision-making power within the household.

Information on the socio-economic status of the household such as household size (*FamSize*), the square of family-size (*FamSizeSq*), amount of farmland (*Farmland*), and the square of this variable (*FarmlandSq*), a dummy variable indicating whether the household owned homestead land (*HomesteadLand*), a dummy variable indicating whether the household had dirt floors (*DirtFloor*), and a dummy variable indicating whether the child's mother owned any jewelry (*OwnJewelry*).[27] Income of the household head was also included as a control variable (*HeadIncome*). Among community level characteristics, information on whether the household was in a Treatment area (*TreatmntArea*).[28]

Summary statistics of all the variables are presented in Table 10. Noticeably absent from the list of independent variables are any measures of the returns to education, or the costs of education. Given that the data come from a small part of Bangladesh however, it is likely that they do not vary across the sample and can be omitted from our analysis.

7.2 Results Under Assumptions of Exogeneity of Female Headship

We first consider the case where both types of female-headship are assumed to be exogenous. Suppose that the model, based on Equation 1 is given by:

$$s_{ihk} = \beta_0 + \beta_c c_i + \beta_x x_{ih} + \beta_W \text{WHH}_{hk} + \beta_M \text{MWHH}_{hk} + \epsilon_{ihk} \tag{3}$$

where s_{ihk}, c_i, x_{ih}, WHH_h, and MWHH_h) are as defined in Equation 1, and ϵ_{ihk} is an error term.

The results of the probit regressions are presented in Table 11. The upper panel of this table presents

[26]The variable *Female* took value 1 if the child was a girl and 0 if the child was a boy.

[27]None of the results that will be presented in the following section depend on the inclusion of the two family-size variables. A set of results which excludes them is available from the author.

[28]The International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) has been maintaining a demographic surveillance system in the area since 1966. Half of the surveillance area, the treatment area, consists of villages that have been brought under a program which launched widespread interventions to improve family planning, reduce population growth, and improve overall health. The other half of the area, being served by the government family planning program, was not targeted by such programs. More details of this program are available in Razzaque and Streatfield (2001).

results for the specification where no control variables are included. The results suggest that children of MWHHs appear to be less likely to work, more likely to have ever attended school, more likely to be currently enrolled in school and more likely to have completed two years of primary school. The children of WHHs do not appear to have any of these advantages. Though the results are not statistically significant, the signs on the coefficients suggest that children of widows are more likely to work, and are disadvantaged relative to children from other households in all three measures of schooling.

The bottom panel of Table 11 presents the results for the case where control variables are also included.[29] In this case, I find that the disadvantages of children faced by widows are statistically significant. These children are less likely to work, and have lower likelihoods of ever attending school, being currently enrolled in school, and having completed basic primary school. Compared to the case where no control variables were included, the results are weaker for the children of MWHHs. It is still however, apparent that children from such households appear to have higher likelihoods of being enrolled in school and completing basic primary school.

7.3 Two-Stage Least Squares Methods

Now suppose that female household-headship is endogenously determined, i.e. there exists an unobservable that directly affects both types of female-headship as well as children's schooling. The error term ϵ_{ihk} is assumed to consist of two components:

$$\epsilon_{ihk} = \nu_{hk} + \zeta_{ihk} \tag{4}$$

where ζ_{ihk} is independent and identically distributed, and ν_{hk} is an unobservable for household h in village k that affects both children's schooling and female-headship. The unobservable ν_{hk} may be regarded as a measure of the ability of a child's father to head his own household. In other words, it is a measure of the quality of the mother's "match" at the time of her marriage. A poor quality of match increases the probability of a mother's being a female-head because she is a widow. A high quality of the match increases the probability of a mother's being a female-head because the child's father migrated away.

Under these assumptions, it is well-known that the coefficients for WHH_i and $MWHH_i$ obtained from the estimation of Equation 3 will be biased and inconsistent. More specifically, the Probit estimates of β_W and β_M will be biased downwards and upwards respectively.[30]

[29] Complete results that present the coefficients on the control variables, are presented in Appendix 1.

[30] This is because $\text{cov}(WHH_{hk}, \nu_{hk}) < 0$ and $\text{cov}(MWHH_{hk}, \nu_{hk}) > 0$.

A way to consistently estimate Equation 2 with both types of female headship variables treated as endogenous is to use a two-stage least squares (2SLS) procedure. Identification requires choosing a set of instruments (Z_h), that are significantly correlated with WHH_{hk} and $MWHH_{hk}$ but uncorrelated with s_{ihk}. Though two instruments are required for identification, I use several such instruments and then check for overidentification: (1) A dummy variable indicating whether the child's maternal grandfather (mother's father) was alive at the time of her marriage; (2) The average level of rainfall when the mother was between the ages of 11 and 15; (3) The fraction of the village that has siblings resided in other thanas of Bangladesh (but not Dhaka city or abroad); (4) The fraction of the village that has siblings residing in either Dhaka city or outside the country. The first two instruments are included because they are likely to be correlated with a mother's chances of being widowed. The latter two instruments are included because they have strong explanatory power in explaining a parent's decision to migrate away from the village.[31]

Since the endogenous variables are dummy variables, I apply the two stage approach of Blundell and Smith (1989) and Davidson and Mackinnon (1993).[32] In the first stage, a linear probability model is used to obtain predicted residuals. To correct for heteroskedasticity, each of the first stage equations are estimated by OLS, predicted values are obtained, and the estimation is repeated using weighted-least squares with the inverse of predicted values as weights (Maddala, 1983). In the second stage, the dummy variables WHH_{hk} and $MWHH_{hk}$ are included as explanatory variables along with the residuals obtained from the first stage. The t-statistic of the residuals provides a test for the exogeneity of the coefficient and is similar to a Hausman-test (Davidson and McKinnon, 1993).

Table 12 presents the results from the estimation of a specification of Equation 2 where no control variables are included in the analysis. The upper panel shows the results from the first-stage regression and the lower-panel shows the results from the second-stage regression. At first glance, note that the second-stage results are very different from the results obtained from the estimation of Equation 3. In general, the statistically significant coefficients for the for the variables "Head Widow" and "Head Married" seem to biased downwards and upwards respectively.

The results presented in Table 12 indicate that children from MWHH are 24% *less* likely to work than their counterparts in MHH. They also have stronger schooling attainment: they are 25% more likely to be enrolled

[31] I tried to use two additional instruments as well: (1) The fraction of women in the mother's natal village who were married in the same year that paid a dowry, and (2) The number of "eligible" men in the Matlab area at the time that the mother's marriage took place. These were omitted from the final analysis because they lacked explanatory power and lowered the joint-significance of the instrument set as a whole.

[32] The analysis was also carried out using simple two-stage-least-squares methods, instrumental variables using Amemiya's generalized-least-squares (Maddala, 1987), and the Powell's semi-parametric IV methods. The results obtained here are robust to the choice of estimation strategy. Results are available upon request.

in school at the time of the survey (column (3)). They are also 27% more likely to have ever attended school (column (2)) and 32% more likely to have completed two years of primary school (column (4)) but these results not statistically significant. Children residing in WHH however, appear to be quite different. Widowhood appears to have no statistically significant effect on child labor (column (1)), whether a child has ever attended school (column (2)) and whether a child has completed two years of primary school (column (4)). Widowhood does however, appear to have a positive and statistically significant effect on whether a child is currently enrolled in school (column (3)). The null-hypothesis of exogeneity of the WHH and MWHH variables is rejected at the 5% or 10% level in two of the four regressions.

Table 13 presents the results for the case where Equation 2 is estimated with control variables included in the analysis.[33] The results indicate that compared to children from MHH, children from MWHH are 12% less likely to work, 19% more likely to have ever attended school, 8% more likely to be currently enrolled in school and 41% more likely to have completed two years of primary school (the coefficients for the three schooling variables are statistically significant at the 1% or 5% level). The null-hypothesis of the exogeneity of the MWHH is rejected at the 1% level in the two of the schooling regressions

As in the case where no control variables were employed in the analysis, the results are very different for children residing in WHH. Compared to children from male-headed households, the children of widows are 93% more likely to work (column (1)), and this result is significant at the 10% level. There is however, no statistically significant effect of widowhood on children's schooling (columns (2–4)). The null-hypothesis of the exogeneity of WHH is rejected at the 10% level in the child-labor regression.

Appendix 2 further explores the impact of household structure on schooling attainment of children.[34] Measures of hours a day spent in school, absenteeism from school and key cognitive skills such as the ability to read, write, add and multiply are used as dependent variables. The results indicate indicate that children from widow-headed households appeared to be less likely to attend school for at least two hours a day, more likely to miss school for more than two weeks in the three months preceding the survey and were around 13% less likely to be literate and 23% less likely to be numerate than their counterparts in male-headed households. Children from MWHH on the other hand, were more likely to attend school for more than two hours a day, were less likely to be absent from school, were 20% more likely to be literate and 23% more likely to be numerate than their counterparts in male-headed households.

[33] Again, complete results that present the coefficients on the control variables, are presented in Appendix 1.

[34] These results were not included here because they were pertinent to only a different sample of children than the sample I have considered here. The samples are different because information on schooling attendance, school-starting-ages and cognitive skills was available for only those children who were residing at home at the time of the MHSS survey. Since girls generally leave the household by the age of 14, 25% of the girls were missing from the analysis, causing a selection problem.

In general, the results suggest that children from widow-headed households work more than children from male-headed households. There is no evidence however, that this higher incidence of child labor results in lower schooling attainment: residing in a widow-headed household appears to have no statistically significant effect on any of the measures of schooling attainment considered here. The double burden of work and school however, seems to result in lower intensities of schooling for these children, higher rates of absenteeism and perhaps lower level of cognitive development. Children of the married female-heads face a very different situation. Compared to children from male-headed households, they have lower rates of participation in paid or unpaid labor outside the home, higher rates of schooling enrollment (both in the past and at the time of the survey) and are more likely to have completed two years of primary school.

8 Summary and Conclusion

Efforts to understand the consequences of female headship on poverty and the welfare of children has often been obscured by the tendency to treat female-headed households as a homogeneous group, as well as the tendency to ignore the possibility that female-headship is endogenous to children's outcomes. This paper deals with these issues using a unique dataset from the Matlab area of Bangladesh that combines census data from 1974 and 1982 with a rich socio-economic survey in 1996.

A descriptive analysis of the data suggests that female-headed households in Bangladesh typically fall into two categories: households headed by widows and households headed by married women, most of whom are the wives of migrants. Widows who head their own households generally do not remarry. In this group, the transition from female-headed households to male-headed households occurs as their status changes from the household head to mother of the head.

A comparison of both types of female-headed households with male-headed households suggests that they have very different circumstances: widow-headed households have lower levels of asset holdings and appear to be poorer. Households headed by married women however, are wealthier than male-headed households. Though they own less agricultural or homestead land, they have higher incomes, very high levels of remittances, and higher ownership of assets such as jewelry and electronic goods.

There are also strong differences in the socio-economic backgrounds of the two types of female-heads. Compared to the wives of male heads, widows not only married older men, but are are less likely to have brought dowries to their husband's families, more likely to have lost their father and/or mother before their marriage, had fewer brothers and sisters, and come from poorer families than the families they married into.

The comparisons for married female-heads on the other hand, are almost exactly the opposite: these women are more likely to have brought dowries into the homes of their husbands, more likely to have a living father and mother at the time of their marriage, have more brothers, and come from wealthier families than the families they married into.

The empirical analysis of the effects of female headship on children's educational outcomes has been carried out in two stages. First, for the sake of consistency with numerous other empirical studies, for both types of female-headed households, female headship is treated as an exogenous variable. In this case we find that children belonging to households headed by married female-heads are less likely to work outside the home and have stronger educational attainment: they are more likely to have ever attended school, be currently enrolled in school and have completed two years of primary school. Children belonging to households headed by widows however, are more likely to work outside the home and appear to have a weaker schooling attainments compared to children in male-headed households.

In a second stage of analysis, both types of female-headship are viewed as endogenous. Results show that though children from households headed by widows are 93% more likely to work (compared to children from male-headed households), there is no statistically significant effect of mother's widowhood on any measure of their schooling outcomes. Children from households headed by married women on the other hand, have significantly stronger schooling attainment than children from male-headed households: they are 19% more likely to have ever attended school, 8% more likely to be currently enrolled in school and 41% more likely to have finished at least two or more years of school.

The findings of this paper suggest that analyses of the *consequences* of female headship should pay close attention to the *causes* of female headship. Though the data used in this analysis were drawn from a small region of Bangladesh, this general conclusion extends to international comparisons as well. The causes of female headship vary across different countries and even within countries of the world. In the United States and other industrialized countries for example, female-headed households generally include women who are divorced, separated, single unmarried mothers, and widows (McLanahan and Sandefur, 1986; Wojtkiewicz, McLanahan and Garfinkel, 1990; Folbre, 1991). In Africa however, a large number of female-headed households in rural areas are "left-behind" households whose male members have migrated to urban areas in search of employment (Lloyd and Blanc, 1996). In Latin America, it is women who migrate to cities and thus there is an increase in female headship in urban area (Mencher and Okungwu, 1989). Focusing on the consequences of female headship without controlling for the causes introduces selectivity and simultaneity problems.

The findings of this paper also have some policy implications. First, the results suggest that since not

all female-headed households are overrepresented among the poor, the heterogeneity of female heads should also be taken into consideration in designing policies that aim to improve children's health and education. Second, neglecting the endogeneity of variables pertaining to household structure may result in a failure of poverty-reduction programs that target households or children based on the gender of the household head.

More research is necessary to fully understand the effects of household structure, poverty and children's well-being. Undoubtedly, a clearer understanding of these issues can improve the design of policy, contribute to the reduction of poverty and improvement in children's human capital in the long run.

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Tables

Table 1: The Incidence of Female-Headed Households in Matlab

Household Type	No. of households	% of Total
1974 Data		
Female-Headed Households	3335	11.68%
Widow Headed Households	2015	7.0%
Total Number of Households	28586	100%
1982 Data		
Female-Headed Households	3395	12.90%
Widow Headed Households	2197	8.4%
Total Number of Households	26306	100%
1996 Data		
Female-Headed Households	665	15.20%
Widow Headed Households	385	8.80%
Total Number of Households	4364	100%

Table 1: The incidence of female-headed households and widows in the 1974 Census, 1982 Census and 1996 MHSS.

Table 2: Living Arrangments of Widows

Widow's Reln to Head	No. of Widows	% of Widows	% of Total
Head of own household	394	25.5%	9.0%
Wife	72	4.70%	1.6%
Mother	560	36.20%	12.8%
Mother-in-law	90	5.8%	2.1%
Grandmother	11	.07%	0.03%
Daughter	19	1.2%	0.04%
Sister	11	.07%	0.03%
Daughter-in-law	11	.07%	0.03%
Other relationship	34	2.2%	0.08%
Total no. of ever-widowed women	1546	100%	35.40%
Total no. of households	4364		100%

Table 2: Information on living arrangents of women who had ever been widowed at the time of the 1996 surveyed.

Table 3: Household Composition of Male- and Female-Headed Households

	FHH	MHH	Difference	P-value
1974 Data				
Household Size	3.59	6.17	-2.57***	.000
Number of Adult Men	.350	1.69	-1.33***	.000
Number of Adult Women	1.33	1.53	-.20***	.000
Number of Male Children	1.00	1.36	-.36***	.000
Number of Female Children	1.23	1.83	-.60***	.000
Age of Head	43.12	46.26	-3.13***	.000
1982 Data				
Household Size	3.93	6.48	-2.55***	.000
Number of Adult Men	1.81	3.79	-1.98***	.000
Number of Adult Women	2.79	3.52	-.73***	.000
Number of Male Children	1.17	1.55	-.37***	.000
Number of Female Children	1.46	2.14	-.68***	.000
Age of Head	45.59	48.01	-2.41***	.000
Land Holdings				
1996 Data				
Household Size	3.97	5.81	-1.84***	.000
Number of Adult Men	.82	1.89	-1.07***	.000
Number of Adult Women	1.66	1.78	-.12***	.000
Number of Male Children	1.32	2.67	-1.35***	0.001
Number of Female Children	1.91	2.17	-.26***	.000
Age of Head	46.89	48.97	-2.08***	.000

Table 3: Demographic information for male and female-headed households in the 1974 census, 1982 census and 1996 MHSS.

Table 4: A Comparison of Socio-economic Circumstances of Households Headed by Men, Widows and Married women

	Descriptions			Comparisons	
	MHH	**WHH**	**MWHH**	**WHH − MHH Difference**	**MWHH − MHH Difference**
Head Income	13425.67	11475.47	18604.46	-1950.204 (2873.407)	4876.335 (4334.433)
Head Remittances	946.1255	4503.025	10632.36	3556.9 (302.37)***	9498.381 (487.29)***
Non-Head Income	3282.701	3155.882	.697	-126.8186 (2013.457)	-3274.801 (3002.638)
Non-Head Remittances	92.879	257.8982	126.1062	165.019 (45.33)***	31.081 (51.24)
Farmland	.228	.055	.057	-.173 (.107)*	-.172 (.163)
Own Homestead Land	.959	.882	.916	-.077 (.010)***	-.041 (.014)***
House has dirt Floor	.082	.435	.097	.353 (.014)***	.031 (.019)**
Own Jewelry	.590	.449	.688	-.140 (.023)***	.353 (.014)***
Own Clock	.452	.302	.539	-.149 (.023)***	.085 (.034)***
Own Radio	.257	.182	.311	-.075 (.020)***	.053 (.030)**
Own TV	.038	.013	.065	-.024 (.008)***	.025 (.013)**

Table 4: Notes: (i) MHH, WHH and MWHH stand for "Male-Headed Households", "Widow Headed Households" and "Married-Woman-Headed-Households" respectively; (ii) "Per-cap" stands for per-capita; (iii) The superscripts *, **, and *** on the standard errors indicate that the means are significant at the 10%, 5% and 1% level respectively.

Table 5: A Comparison of Expenditures of Households Headed by Men, Widows and Married Women

	Descriptions			Comparisons	
	MHH	**WHH**	**MWHH**	**WHH − MHH Difference**	**MWHH − MHH Difference**
Total Food	21.22	21.75	24.97	.53 (1.115)	3.74 (1.61)**
Total Non-Food	1317.902	1519.871	1725.538	201.96 (156.64)	407.63 (213.896)
Clothing	303.578	335.636	365.703	32.057 (25.476)	62.125 (23.43)***
Rituals	183.201	118.508	205.63	-64.69 (57.31)	22.43 (85.33)
Medical	35.031	36.652	31.954	1.621 (6.86)	-3.076 (9.98)
Transportation	19.972	18.301	18.423	-1.670 (2.12)	-1.55 (3.065)
Direct Educational Expenditure for Householders	29.655	27.74	47.659	-1.909 (10.041)	18.00 (11.84)*
Direct Educational Expenditure for Non-Householders	9.071	8.44	18.554	-.621 (4.79)	9.48 (6.85)
Indirect Educational Expenses	296.38	302.68	599.832	6.29 (34.11)	303.447 (59.94)***

Table 5: Notes: (i) MHH, WHH and MWHH stand for "Male-Headed Households", "Widow Headed Households" and "Married-Woman-Headed-Households" respectively; (ii) All measures of expenditure are calculated in per-capita terms; (iii) The superscripts *, **, and *** on the standard errors indicate that the means are significant at the 10%, 5% and 1% level respectively.

Table 6: A Comparison of Schooling Attainment of Children from Households Headed by Men, Widows and Married Women.

	Descriptions			Comparisons	
	MHH	**WHH**	**MWHH**	**WHH − MHH Difference**	**MWHH − MHH Difference**
Performs Unpaid Work	.172	.244	.067	.071	-.104
				(.024)***	(.022)***
Performs Paid Work	.061	.100	.030	.039	-.031
				(.014)***	(.013)***
Ever Attended School	.896	.831	.972	-.064	.077
				(.019)***	(.017)***
Currently Attending School	.806	.706	.927	-.100	.117
				(.024)***	(.021)***
Two Years of School	.758	.681	.890	-.076	.132
				(.027)***	(024)***
Five Years of School	.351	.333	.473	-.017	.122
				(.030)	(.027)***
Seven Years of School	.167	.170	.267	.003	.101
				(.023)	(.021)***
Ten Years of School	.017	.011	.037	-.005	.020
				(.008)	(.007)***

Table 6: Notes: (i) MHH, WHH and MWHH stand for "Male-Headed Households", "Widow-Headed-Households" and "Married-Woman-Headed-Households" respectively. (ii) The superscripts *, **, and *** on the standard errors indicate that the means are significant at the 10%, 5% and 1% level respectively; (iii) The variable "unpaid work" is a binary variable that indicates whether the child performs unpaid agricultural or non-agricultural work outside the home; (iv) The variable "paid work" is a binary variable that indicates whether the child earns any form of wages in cash or in-kind for agricultural or non-agricultural work performed in or outside the home.

Table 7: A Comparison of Circumstances at Marriage for Women in Households Headed by Men, Widows and Married Women

	Descriptions			Comparisons	
	MHH	**WHH**	**MWHH**	**WHH – MHH Difference**	**MWHH – MHH Difference**
Father alive at marriage	.784	.547	.853	-.237	.069
				(.016)***	(.024)***
Mother alive at marriage	.870	.614	.945	-.256	.075
				(.014)***	(.019)***
Age at marriage	11.36	10.15	12.51	-1.21	1.16
				(.300)***	(.443)***
Husbands age at marriage	26.64	26.89	22.78	.247	-3.88
				(2.51)	(3.02)
Ever Attdended School	.379	.277	.590	-.101	.218
				(.024)***	(.029)***
Husbands years of schooling	3.60	2.71	5.93	-.899	2.34
				(.156)***	(.239)***
Paid Dowry	.272	.106	.329	-.167	.056
				(.021)***	(.026)***
Dowry in form of bride-wealth	.138	.061	.149	-.077	.011
				(.013)***	(.020)***
Dowry in form other than bride-wealth	.190	.126	.190	-.063	-.0001
				(.015)***	(.023)
Father owned land	.448	.395	.497	-.053	.048
				(.165)	(.231)
Father richer than father-in-law	.390	.226	.459	-.152	.068
				(.019)***	(.029)***
Number of brothers	2.33	1.86	2.49	-.481	.155
				(.076)***	(.093)*
Sibling sex-ratio	1.31	1.11	1.35	-.201	.033
				(.064)***	(.076)***

Table 7: Notes: (i) MHH, WHH and MWHH stand for "Male-Headed Households", "Widow Headed Households" and "Married-Woman-Headed-Households" respectively; (ii) The superscripts *, **, and *** on the standard errors indicate that the means are significant at the 10%, 5% and 1% level respectively.

Table 8: The Current Living Situations of the Wives of Migrants.

Wife of Migrant's Reln to Head	N	% of Total
Head of own household	226	49.78%
Daughter-in-law	104	22.92%
Daughter	60	13.22%
Wife	28	6.17%
Mother	13	2.86%
Sister	5	1.10%
Mother-in-law	3	0.66%
Other	15	3.30%
Total	454	100%

Table 8: Living situations of wives of migrant workers at the time of the 1996 survey.

Table 9: A Comparison of the Circumstances of Migrants who migrated alone versus with their families.

	Migrated alone		Migrated with family	
	N	% of Total	N	% of Total
Other information				
Knew someone in new location	519	53.12%	312	53.79%
Had a brother in new location	42	3.84%	105	16.88%
Married at the time of migration	241	41.55%	573	58.65%
Total Number of respondents	580		977	
Motivation for migration				
Never found job at previous location	21	6.67%	17	8.42%
Lost employment at previous location	25	7.94%	15	7.43%
Found better job at new location	126	40.00%	90	44.55%
Hoped to find better job at new location	117	37.14%	46	22.77%
Family in new location needed assistance in family farm/business	7	2.22%	13	6.44%
Retired	4	1.27%	1	0.50%
Other reasons	15	4.76%	20	9.90%
Number of respondents	317	100 %	202	100%

Table 9: Economic motivations for migration: Differences between migrants who migrated alone versus those who migrated with their families.

Table 10: Summary of Key Variables in the Schooling Regressions

Variable Description	Variable	Mean	Std. Dev	Min	Max
Dependent variables:					
Earning Wages/Working outside the home	CurrWorks	.174	.379	0	1
Ever attended school	EverAttd	.897	.303	0	1
Currently Enrolled in School	CurrEnrolled	.815	.389	0	1
Two Years of Primary School	TwoYrsPrimSch	.716	.451	0	1
Control variables:					
Child's age (%10)	Age	12.949	3.139	8	18
Child's age squared (%10)	Agesq	17.754	8.193	6.4	32.4
Child female	Female	.467	.499	0	1
Family religion hindu	Hindu	.087	.281	0	1
Family size (%10)	FamSize	.615	.235	.1	2
Family size squared (%100)	FamSizeSq	.434	.354	.01	4
Mother's age (%10)	MotherAge	4.381	1.076	1.717	8.175
Sex ratio of mother's siblings	MoSibSR	1.302	1.191	0	9
Highest education on bari (%10)	MaxEdBari	.635	.425	0	1.7
Mother ever attended school	EverAttdMo	.366	.482	0	1
Father's years of education	YearsEdFa	.354	.367	0	1.7
Mother paid dowry at marriage	Dowry	.232	.422	0	1
Income of household head (%1000)	HeadIncome	.000	.018	-.004	.356
Household own's jewelry	OwnJewelry	.589	.492	0	1
Household has a dirt floor	DirtFloor	.057	.231	0	1
Household owns homestead land	HomestdLand	.964	.187	0	1
Acres of farmland (%100)	Farmland	.242	2.291	0	96
Household in a DSS "treatment area"	TreatmntArea	.485	.499	0	1

Table 10: Summary statistics of the variables in the schooling regressions.

Table 11 (a): Probit Estimation with No Controls

	CurrWorks	**EverAttd**	**CurrEnrolled**	**TwoYrsPrimSch**
	(1)	(2)	(3)	(4)
Head Widow	.0476	-.1041	-.0205	-.1114
	(.037)	(.0409)***	(.0277)	(.0402)***
Head Migrant's Wife	-.1313	.058	.055	.1061
	(.0214)***	(.0282)**	(.0177)***	(.0314)***
Controls	No	No	No	No
Number of obs	5534	5492	4691	5519
Psuedo R-squared	.0096	.0057	.0043	.0057
Chi-squared stat	22.2017	11.9955	7.2292	18.7477

Table 11(b): Probit Estimation with Controls

	CurrWorks	**EverAttd**	**CurrEnrolled**	**TwoYrsPrimSch**
	(1)	(2)	(3)	(4)
Head Widow	.0313	-.0946	-.0129	-.0041
	(.027)	(.0297)***	(.015)	(.0048)
Head Migrant's Wife	-.0397	.0111	.0221	.0222
	(.0234)*	(.0218)	(.0092)**	(.0127)*
Controls	Yes	Yes	Yes	Yes
N	5079	5038	4328	5245
Pseudo R-squared	.2169	.1398	.2461	.1432
Chi-squared statistic	711.4307	371.5118	468.6766	613.8344

Table 11: Results from Probit Estimation: The upper panel presents results for the case where control variables are excluded, while the lower panel presents results for regressions that include them. Notes: (i) Standard errors are listed in parentheses below the coefficients; (ii) The superscripts *, **, and *** on the standard errors indicate that coefficients are significant at the 10%, 5% and 1% level respectively; (iii) The variables "Head Widow" and "Head Married" indicate whether the child's mother was a widow or a married woman who was head of her own household.

Table 12: Two Stage Least Squares Estimation with No Controls

First Stage Results

	Head Widow	Head Married
	(1)	(2)
Frac of adults with sibs in other thana/dist	-.011 (.0331)	-.0777 (.0376)*
Frac of adults with sibs in city/abroad	-.1497 (.0416)**	.035 (.048)
Mother's father alive at marriage	-.019 (.0079)*	.0161 (.0082)
Average rain when mother aged 10–14	.0747 (.0192)**	-.0871 (.019)**
Controls	No	No
R-squared	.006	.0052
F-statistic	8.7812	7.5809

Second Stage Results

	CurrWorks	**EverAttd**	**CurrEnrolled**	**TwoYrsPrimSch**
	(1)	(2)	(3)	(4)
Head Widow	.836 (1.1108)	-.5104 (.3205)	.1027 (.0614)*	-.6744 (.522)
Head Widow (resid)	-.6621 (1.0234)	.2606 (.1654)*	-.3849 (.2177)*	.7357 (.6001)
Head Married	-.2461 (.137)*	.2702 (.2343)	.2509 (.0832)**	.3235 (.5552)
Head Married (resid)	.1023 (.062)*	-.9455 (.1394)	-.9436 (.049)**	-.425 (.0907)
Controls	No	No	No	No
N	5731	5813	4960	5710
Pseudo R-squared	.0182	.0161	.0143	.0067
Chi-squared statistic	34.8891	31.8415	18.0827	21.446
Test for WidowFH - MWFH = 0.0				
Chi-squared statistic	16.77	17.86	10.78	2.49
Prob > chi2	0.000	0.000	0.001	0.114

Table 12: Results from the first stage (second stage) are presented in the upper panel (lower panel). No control variables are included among the independent variables. Notes: (i) Standard errors are listed in parentheses below the coefficients, (ii) The superscripts *, **, and *** on the standard errors indicate that coefficients are significant at the 10%, 5% and 1% level respectively; (iii) The variables "Head Widow" and "Head Married" indicate whether the child's mother was a widow or a married woman who was head of her own household; (iv) Variables followed by *(resid)* are residuals from the first stage regression.

Table 13: Two Stage Least Squares Estimation with Controls

	First Stage Results	
	Head Widow	**Head Married**
	(1)	(2)
Frac of adults with sibs in other thana/dist	.0062	-.195
	(.0304)	(.0369)***
Frac of adults with sibs in city/abroad	-.1268	.0412
	(.0396)***	(.0473)
Mothers father alive at marriage	-.0276	.0168
	(.0072)***	(.0088)*
Average rain when mother aged 10–14	-.0401	-.041
	(.0202)**	(.0241)*
Controls	Yes	Yes
R-squared	.0594	.0613
F-statistic	16.312	16.882
Prob>F	.0000	.0000
F-statistic for instruments	8.65	8.07
Prob>F for instruments	0.0002	.0000

	Second Stage Results			
	CurrWorks	**EverAttd**	**CurrEnrolled**	**TwoYrsPrimSch**
	(1)	(2)	(3)	(4)
Head Widow	.9397	-.7253	.0428	-.187
	(.4271)**	(.6011)	(.1264)	(.2849)
Head Widow (resid)	-.8967	.3671	-.098	.059
	(.4169)**	(.3542)	(.3067)	(.133)
Head Married	-.1211	.1943	.0891	.4085
	(.3734)	(.0555)***	(.0434)**	(.1208)***
Head Married (resid)	.335	-.9959	-.4331	-1.8062
	(.5544)	(.2896)***	(.2223)*	(.5486)***
Controls	Yes	Yes	Yes	Yes
N	5440	5563	4645	5307
R-squared	.2406	.1668	.246	.1897
Chi-squared statistic	479.8298	293.1921	325.5894	521.4526
Test WidowFH - MWFH = 0.0				
Chi-squared statistic	3.52	8.65	2.33	10.53
Prob > chi2	.0608	.0033	.1265	.0012

Table 13: Results from the first stage (second stage) are presented in the upper panel (lower panel). Control variables are included among the independent variables. Notes: (i) Standard errors are listed in parentheses below the coefficients, (ii) The superscripts *, **, and *** on the standard errors indicate that coefficients are significant at the 10%, 5% and 1% level respectively; (iii) The variables "Head Widow" and "Head Married" indicate whether the child's mother was a widow or a married woman who was head of her own household; (iv) Variables followed by *(resid)* are residuals from the first stage regression.

Appendix

Full Results

Table A: Probit Regressions on the Determinants of Widowhood, Husband's Migration, and Female Headship.

	Widow	Migrant's Wife	Widow Female Head	Married Female Head
	(1)	(2)	(3)	(4)
Bride's age at marriage	.2093	.052	.0888	.0214
	(.0649)**	(.0404)	(.0334)**	(.023)
Groom's age at marriage	-.188	.6577	.255	.3944
	(.1034)	(.0593)**	(.0466)**	(.0581)**
Groom's age at marriage missing	.024	.2937	.4239	.4478
	(.0296)	(.0462)**	(.0891)**	(.1168)**
Groom's years of schooling	.0032	.0175	-.0056	.0156
	(.0111)	(.0076)*	(.0051)	(.0043)**
Bride ever attended school	-.0271	.0187	-.0123	.0068
	(.0089)**	(.0067)**	(.004)**	(.0047)
Sex-ratio of bride siblings	-.0541	.0412	-.0149	-.0006
	(.043)	(.0266)	(.0229)	(.0151)
Sex-ratio of brides children	-.0027	-.0166	-.0083	-.0122
	(.0034)	(.003)**	(.0024)**	(.0035)**
Farmland owned by groom's household	.0114	.0039	.0062	-.0395
	(.015)	(.0107)	(.0071)	(.0132)**
Farmland squared	-.01	-.003	-.0041	.0098
	(.0129)	(.0054)	(.0044)	(.0034)**
Bride's father alive at marriage	-.0009	.0013	-.0048	.0035
	(.0088)	(.0072)	(.0056)	(.004)
Dowry paid to groom as bride-wealth	-.0375	-.0138	-.013	-.0005
	(.0071)**	(.007)*	(.0034)**	(.0038)
Dowry paid to groom other than bride-wealth	-.0117	.03	.0022	.0015
	(.0065)	(.0103)**	(.0041)	(.0037)
Frac of the village with sibs in other thana/dist	.0083	-.0213	.0093	-.025
	(.0288)	(.0227)	(.0142)	(.0119)*
Frac of adults with sibs in city/abroad	-.0766	.0772	-.0089	.0812
	(.1028)	(.0762)	(.0456)	(.0446)
Averate rain when bride aged 10–14	-.0201	-.0108	-.0141	-.0125
	(.0164)	(.0118)	(.0085)	(.0078)
constant	-.802	-3.3732	-3.126	-4.1228
	(.5813)	(.3975)**	(.7243)**	(.8383)**
N	4885	4885	4885	4885
Pseudo R-squared	.1375	.1375	.2404	.3157
Chi-squared statistic	114.0519	236.9852	173.0119	178.5033

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Table A: Probit Regressions on the Determinants of Widowhood, Husband's Migration, and Female Headship.

	Widow	Migrant's Wife	Widow Female Head	Married Female Head
	(1)	(2)	(3)	(4)

Table A: Notes: (i) Standard errors are listed in parentheses below the coefficients, (ii) The superscripts *, **, and *** on the standard errors indicate that coefficients are significant at the 10%, 5% and 1% level respectively; (iii) The sample includes adult ever-women who were interviewed in the MHSS; (iv) For women who have married several times, the information used here is pertinent to the first marriage.

Table B: Probit Regressions For the Schooling Outcomes of Children

	CurrWorks	EverAttd	CurrEnrolled	TwoYrsPrimSch
	(1)	(2)	(3)	(4)
Age	-.0711	.0263	.0768	.3702
	(.0255)***	(.011)**	(.0197)***	(.0206)***
Agesq	.0379	-.0137	-.0423	-.127
	(.009)***	(.004)***	(.0072)***	(.0076)***
Female	-.0975	.0021	.0454	.0026
	(.0101)***	(.0059)	(.0099)***	(.0117)
Hindu	.033	-.0412	-.0743	-.0439
	(.0217)	(.0162)**	(.0243)***	(.0256)
FamSize	.1081	.0102	-.0932	-.0726
	(.0898)	(.0522)	(.0928)	(.1198)
FamSizeSq	-.064	-.0215	.0444	.0095
	(.0519)	(.0288)	(.0528)	(.0683)
MotherAge	.0049	.0023	-.0028	.193
	(.0084)	(.0053)	(.0088)	(.02)***
MoSibSR	-.0006	.0033	-.00009	-.1575
	(.0048)	(.0031)	(.0048)	(.0887)
MaxEdBari	-.0702	.0673	.1086	.0002
	(.0159)***	(.0117)***	(.0171)***	(.0001)
EverAttdMo	-.0397	.0431	.0609	.1066
	(.0118)***	(.008)***	(.0123)***	(.0142)***
YearsEdFa	-.0901	.0658	.1274	.141
	(.0193)***	(.0137)***	(.0202)***	(.0239)***
Dowry	-.0058	.0115	.0006	-.0489
	(.0131)	(.0084)	(.0144)	(.028)
HeadIncome	.0085	-.058	.1983	-.0119
	(.4465)	(.3195)	(.5255)	(.0179)
OwnJewelry	-.0681	.0331	.065	.2267
	(.0122)***	(.0079)***	(.0122)***	(.6343)
DirtFloor	-.0075	.0095	.033	.0406
	(.0284)	(.0205)	(.0273)	(.0387)

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Table B: Probit Regressions For the Schooling Outcomes of Children

	CurrWorks	**EverAttd**	**CurrEnrolled**	**TwoYrsPrimSch**
	(1)	(2)	(3)	(4)
HomestdLand	.0213	.0002	.0191	.0626
	(.0218)	(.0164)	(.0292)	(.0142)***
Farmland	-.0033	.0006	.0061	.0266
	(.0051)	(.0025)	(.0053)	(.0378)
TreatmntArea	.0107	-.0139	-.0236	.011
	(.0106)	(.0067)**	(.0107)**	(.0117)
Head Widow	.0281	-.0261	-.0422	-.0053
	(.0251)	(.0178)*	(.0259)*	(.004)
Head Married	-.0292	.0156	.0378	.016
	(.0195)*	(.0136)	(.0198)*	(.0138)
Constant	.6291	-.4228	-.8947	-8.6642
	(1.0752)	(.8467)	(.7589)	(.8824)***
N	4045	4504	4341	5066
Pseudo R-squared	.2336	.2137	.2667	.2272
Chi-squared stat	592.8065	340.6854	702.8718	868.3419

Table B: Notes: (i) Standard errors are listed in parentheses below the coefficients, (ii) The superscripts *, **, and *** on the standard errors indicate that coefficients are significant at the 10%, 5% and 1% level respectively; (iii) The variables "Head Widow" and "Head Married" indicate whether the child's mother was a widow or a married woman who was head of her own household.

Table C: First Stage IV Results

	Head Widow	**Head Married**
	(1)	(2)
Age	-.007	.0043
	(.0073)	(.0088)
Agesq	.0031	-.0023
	(.0028)	(.0034)
Female	-.0026	.0136
	(.0049)	(.0059)**
Hindu	-.0147	-.054
	(.009)*	(.0107)***
FamSize	-.6389	-.548
	(.0555)***	(.0617)***
FamSizeSq	.294	.2281
	(.034)***	(.0381)***
MotherAge	.0393	-.0034
	(.0053)***	(.0062)
MoSibSR	-.0134	-.1098
	(.0258)	(.031)***
MaxEdBari	-.0518	-.0313
	(.008)***	(.0096)***
EverAttdMo	-.0056	.0179
	(.0057)	(.0068)***
YearsEdFa	.0484	.0954
	(.0089)***	(.0108)***
Dowry	-.0295	-.0078
	(.0062)***	(.0075)
Household Income	.1049	.8221
	(.1127)	(.1726)***
OwnJewelry	-.0141	.0244
	(.0053)***	(.0063)***
HomestdLand	-.0421	-.0303
	(.0132)***	(.0159)
Farmland	-.003	-.0061
	(.002)*	(.0033)*
TreatmntArea	.0136	.0156
	(.0051)***	(.0061)**
Frac of adults with sibs in other thana	.0062	-.195
	(.0304)	(.0369)***
Frac of adults with sibs in city/abroad	-.1268	.0412
	(.0396)***	(.0473)
Mothers father alive at marriage	-.0276	.0168
	(.0072)***	(.0088)*
Average rain when mother aged 10–14	-.0401	-.041
	(.0202)**	(.0241)*

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Table C: First Stage IV Results

	Head Widow	**Head Married**
	(1)	(2)
Constant	.4229	.3942
	(.0671)***	(.0802)***
N	5451	5451
R-squared	.0594	.0613
F-statistic	16.312	16.882
F-stat for instruments	6.85	8.73
Prob > F		

Table C: Notes: (i) Standard errors are listed in parentheses below the coefficients, (ii) The superscripts *, **, and *** on the standard errors indicate that coefficients are significant at the 10%, 5% and 1% level respectively.

Table D: Second Stage IV Results

	Second Stage Results			
	CurrWorks	**EverAttd**	**CurrEnrolled**	**TwoYrsPrimSch**
	(1)	(2)	(3)	(4)
Age	.0001	.0405	.0468	.4094
	(.00007)	(.015)***	(.0133)***	(.0277)***
Agesq	.0105	-.0211	-.0238	-.1422
	(.003)***	(.0063)***	(.0049)***	(.0106)***
Female	-.0675	.064	.027	.0542
	(.0096)***	(.0127)***	(.0076)***	(.024)**
Hindu	.0102	-.0137	.0094	.0454
	(.0094)	(.02)	(.0279)	(.0754)
FamSize	.4523	.0691	.1537	.4161
	(.2255)**	(.1257)	(.1665)	(.32696)
FamSizeSq	-.225	.0068	-.0405	-.1383
	(.1192)	(.0212)	(.0642)	(.5322)
MotherAge	-.0229	-.0015	-.008	-.0134
	(.0346)	(.005)	(.0368)	(.0318)
MoSibSR	.1188	-.0303	.0081	.0807
	(.0501)**	(.0228)	(.0441)	(.1993)
MaxEdBari	-.0188	.1193	.0457	.2424
	(.0258)	(.0387)***	(.0211)**	(.0703)***
YearsEdFa	-.1096	-.0354	-.0004	-.0444
	(.0297)***	(.0213)	(.0115)	(.0624)
EverAttdMo	-.0442	.0196	.0095	.0526
	(.0131)***	(.0149)	(.0183)	(.0196)***
Dowry	.0016	.0099	-.0043	.0023
	(.0019)	(.0051)*	(.0777)	(.0124)
Household Income	.014	-.7113	-.052	-1.2674
	(.0275)	(.4952)	(.171)	(.46)***

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Table D: Second Stage IV Results

	Second Stage Results			
	CurrWorks	**EverAttd**	**CurrEnrolled**	**TwoYrsPrimSch**
	(1)	(2)	(3)	(4)
OwnJewelry	-.0333	.0184	.0162	.0207
	(.0184)*	(.2383)	(.0113)	(.0123)*
HomestdLand	.0289	.0279	.0483	.0896
	(.0183)*	(.0308)	(.1313)	(.0511)
Farmland	-.0383	.0134	.016	.0111
	(.041)	(.0058)**	(.0085)*	(.0089)
TreatmntArea	-.0098	-.0045	-.0205	.0099
	(.0085)	(.0178)	(.0132)*	(.0396)
Head Widow	.9397	-.7253	.0428	-.187
	(.4271)**	(.6011)	(.1264)	(.2849)
Head Widow (resid)	-.8967	.3671	-.098	.059
	(.4169)**	(.3542)	(.3067)	(.133)
Head Married	-.1211	.1943	.0891	.4085
	(.3734)	(.0555)***	(.0434)**	(.1208)***
Head Married (resid)	.335	-.9959	-.4331	-1.8062
	(.5544)	(.2896)***	(.2223)	(.5486)***
Constant	-3.7119	-1.5743	-2.2453	-8.6005
	(1.5912)**	(1.3004)	(1.7316)	(1.0763)***
N	5460	5413	4678	5444
Pseudo R-squared	.2547	.149	.239	.182
Chi-squared statistic	451.6944	271.7515	298.9854	448.3824

Table D: Notes: (i) Standard errors are listed in parentheses below the coefficients, (ii) The superscripts *, **, and *** on the standard errors indicate that coefficients are significant at the 10%, 5% and 1% level respectively; (iii) The variables "Head Widow" and "Head Married" indicate whether the child's mother was a widow or a married woman who was head of her own household; (iv) Variables followed by *(resid)* are residuals from the first stage regression.

Results for a Reduced Sample (Children Aged 9–14)

Table E: An Additional Comparison of Schooling Attainment of children from Households Headed by Men, Widows and Married Women.

	Descriptions			Comparisons	
	MHH	**WHH**	**MWHH**	**WHH – MHH Difference**	**MWHH – MHH Difference**
Hours a day in school	3.43	3.36	3.61	-.138	.205
				(.144)	(.120)*
Hours a day in school > 2	.668	.702	.752	.013	.097
				(.041)	(.034)***
Days of school missed	17.33	18.71	14.45	-.956	-2.788
				(3.002)	(2.33)
Missed more than 2 weeks	.439	.449	.445	-.041	.009
				(.059)	(.045)
Ability to read	.272	.269	.383	-.024	.125
				(.045)	(.039)***
Ability to write	.199	.181	.270	-.037	.085
				(.042)	(.036)***
Ability to add	.313	.292	.405	-.030	.107
				(.046)	(.040)***
Ability to multiply	.229	.239	.312	.004	.093
				(.046)	(.038)***

Table E: Notes: (i) MHH, WHH and MWHH stand for "Male-Headed Households", "Widow Headed Households" and "Married Woman Headed Households" respectively. (ii) The superscripts *, **, and *** on the standard errors indicate that the means are significant at the 10%, 5% and 1% level respectively.

Table F: First Stage IV Results for Additional Measures of Schooling Intensity and Cogitive Skills

	Head Widow	**Head Married**
	(1)	(2)
Age	-.0312	-.0176
	(.0209)	(.0252)
Agesq	.0126	.0075
	(.0087)	(.0104)
Female	.0132	.0131
	(.006)**	(.0073)
Hindu	-.0091	-.0658
	(.0098)	(.0151)***
FamSize	-.6575	-.6764
	(.0693)***	(.0792)***
FamSizeSq	.3025	.2924
	(.0417)***	(.0479)***
MotherAge	.024	.0028
	(.0064)***	(.0073)
MoSibSR	.0241	-.131
	(.0295)	(.0379)***
MaxEdBari	-.0387	-.0442
	(.0097)***	(.012)***
EverAttdMo	-.0074	.0175
	(.0069)	(.0083)**
YearsEdFa	.0398	.1079
	(.0108)***	(.0135)***
Dowry	-.0308	-.0049
	(.0073)***	(.0089)
Household Income	.1098	.8575
	(.149)	(.2026)***
OwnJewelry	-.0202	.0204
	(.0064)***	(.0078)***
HomestdLand	-.0261	-.042
	(.0154)	(.0184)**
Farmland	-.0038	-.0032
	(.0036)	(.0016)**
TreatmntArea	.0043	.0192
	(.0062)	(.0076)**
Frac of adults with sibs in other thana	.0269	-.2337
	(.0388)	(.0462)***
Frac of adults with sibs in city/abroad	-.1999	.093
	(.0479)***	(.0568)
Mothers father alive at marriage	-.0287	.0167
	(.0091)***	(.0111)
Average rain when mother aged 10–14	.0237	-.069

Continued on next page

Table F: First Stage IV Results for Additional Measures of Schooling Intensity and Cogitive Skills

	Head Widow	**Head Married**
	(1)	(2)
	(.025)	(.029)**
Constant	.5215	.596
	(.1394)***	(.1675)***
N	3565	3565
R-squared	.0561	.0718
F-statistic	10.0198	13.046

Table F: Notes: (i) Standard errors are listed in parentheses below the coefficients, (ii) The superscripts *, **, and *** on the standard errors indicate that coefficients are significant at the 10%, 5% and 1% level respectively; (iii) The variables "Head Widow" and "Head Married" indicate whether the child's mother was a widow or a married woman who was head of her own household; (iv) Variables followed by *(resid)* are residuals from the first stage regression.

Table G: Second Stage IV Results for Additional Measures of Schooling Intensity and Cognitive Skills

	SchHrsGrTwo	**MissedGrTwoWeeks**	**Literacy**
	(1)	(2)	(3)
Age	.2474	-.2619	.2952
	(.0983)**	(.2074)	(.1328)**
Agesq	-.0726	.1149	-.0801
	(.0401)	(.094)	(.0524)
Female	-.0348	.0295	-.0058
	(.0306)	(.0239)	(.0404)
Hindu	.0622	-.137	.0345
	(.0502)	(.2158)	(.0262)
FamSize	1.1387	-.7394	.0038
	(1.5269)	(3.3722)	(.0031)
FamSizeSq	-.5843	.1743	-.0598
	(.8358)	(.3923)	(.047)
MotherAge	-.026	-.0392	-.0282
	(1.043)	(.0717)	(.0232)
MoSibSR	.0659	-.199	.0297
	(.3406)	(.1805)	(.0252)
MaxEdBari	.1784	-.1095	.1371
	(.0645)***	(.1368)	(.0386)***
YearsEdFa	-.0695	.151	.1685
	(.0718)	(.3256)	(.4635)
EverAttdMo	.0916	.0875	.1108
	(.0507)*	(.0357)**	(.0323)***
Dowry	.0268	-.0549	.0113

Continued on next page

Table G: Second Stage IV Results for Additional Measures of Schooling Intensity and Cognitive Skills

	SchHrsGrTwo	**MissedGrTwoWeeks**	**Literacy**
	(1)	(2)	(3)
	(.0282)	(.4636)	(.0156)
Household Income	1.5148	1.039	-.4841
	(1.1304)	(2.6342)	(.1909)**
OwnJewelry	.041	.0315	.0973
	(.046)	(.1043)	(.0392)**
HomestdLand	.0344	-.0058	.0722
	(.0259)	(.007)	(.0239)***
Farmland	.0085	-.0104	-.0013
	(.005)	(.0081)	(.0017)
TreatmntArea	.03	-.038	.04
	(.2782)	(.0319)	(.023)*
Head Widow	.1818	-.2881	.2948
	(.8345)	(.7905)	(.2306)
Head Widow (resid)	-.7435	.3024	-.2995
	(4.5241)	(.661)	(.2162)
Head Married	.2144	-.5783	.0808
	(.1322)*	(.7977)	(.0408)**
Head Married (resid)	-.7501	1.699	-.0638
	(.4833)	(2.4811)	(.032)**
Constant	-10.4813	2.6873	-13.1744
	(3.7955)***	(3.2575)	(3.9737)***
N	1861	1648	2105
Pseudo R-squared	.2044	.0239	.2629
Chi-squared stat	196.9405	29.3	281.4964

Table G: Notes: (i) Standard errors are listed in parentheses below the coefficients, (ii) The superscripts *, **, and *** on the standard errors indicate that coefficients are significant at the 10%, 5% and 1% level respectively; (iii) The variables "Head Widow" and "Head Married" indicate whether the child's mother was a widow or a married woman who was head of her own household; (iv) Variables followed by *(resid)* are residuals from the first stage regression.

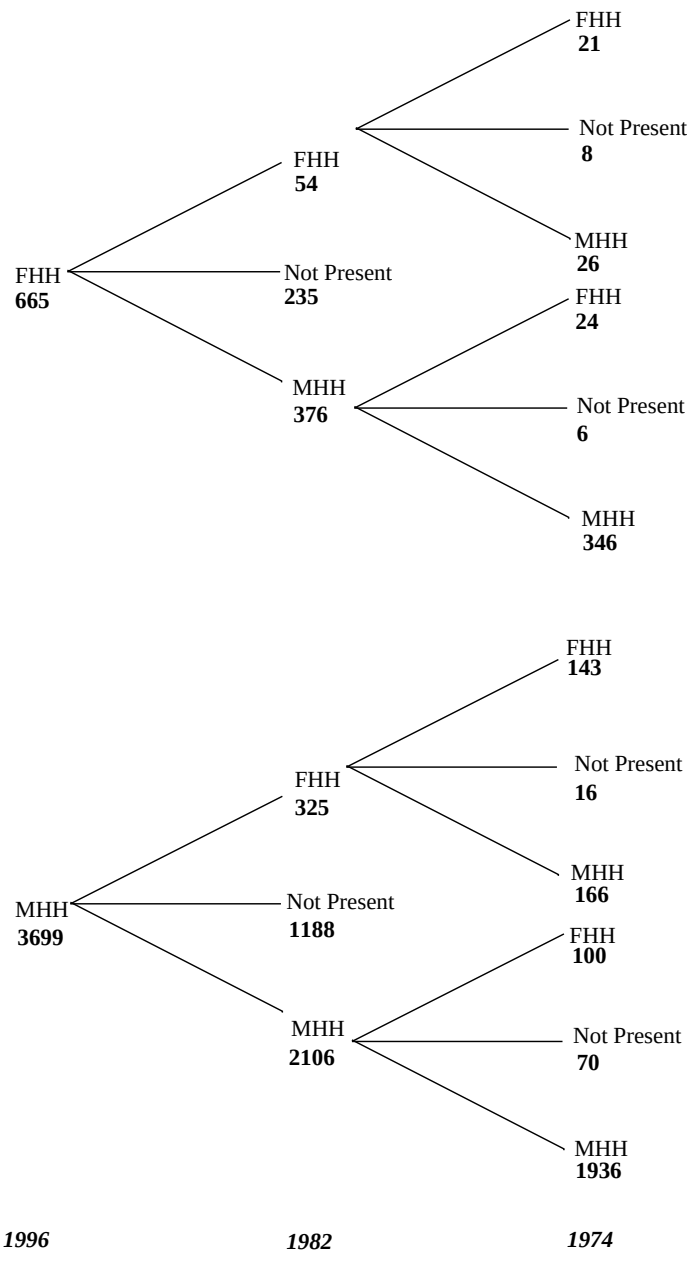

Figure 1: Household histories of male- and female-headed households at the time of the 1996 MHSS. Note the following: (i) There were 379 female-headed households in 1982 (54+325=379). Of these 379 households, 325 (85.7%) had become male-headed by 1996; (ii) There were 288 female-headed households in 1974 (21+24+143+100=288). Of these 288 households, 124 households (43%) became male-headed by 1982.