

# Mother's Autonomy and Child Welfare - A New Measure and Some New Evidence

Tanika Chakraborty\*  
and Prabal K. De†

## Abstract

Existing literature on the effects of a mother's autonomy on her child's welfare assumes that greater income for women automatically translates into greater autonomy in decision making. However, it is not generally known if a dollar earned by a woman is spent by her own volition or at the discretion of her other family member(s) since the exact process of who decides what remains unobservable to researchers. We address this by creating an autonomy index from the principal components of a variety of household decision variables and find that greater autonomy for mother leads to better schooling outcome only for young boys; not girls. Our findings are similar when we use alternative definitions of autonomy and correct for the potential endogeneity of mothers decision by an instrumental variable strategy. These mixed results also caution against the growing popularity of gender-directed cash-transfer policies.

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\*Department of HSS-Economics, Indian Institute of Technology, Kanpur, UP, India 208016, Phone:+91-9005834827, Email: tanika@iitk.ac.in

†Department of Economics, The City College of New York, 160 Convent Avenue, New York, NY 10031, Phone:+1-212-6506208, Email:pde@ccny.cuny.edu

# 1 Introduction

Economists and policymakers have sought to answer the question whether more economic or political power in the hands of a female member in the family has the same welfare effects as equivalent power in the hands of a male member.<sup>1</sup> In the context of both developed and developing countries, it has been found that the effects of a dollar earned by a female member of a family are different from those of a dollar earned by a male member. Except for a few recent studies, evidence overwhelmingly fails to reject the conjecture that incomes accruing to female members of the household are beneficial to the family members, particularly children, in the conventional economic sense - greater female autonomy leads to a reduction in fertility, a rise in birth-weight, and an increase in survival rates.<sup>2</sup> Several countries have implemented policies that are geared towards greater transfer of income towards women.<sup>3</sup>

However, unless we have a measure of female autonomy, we do not know the effectiveness of this line of policy-making. In other words, unless we know that a dollar earned by a female member is spent by her own volition and not as directed by other male members, notably her husband, the efficacy of gender-sensitive policies will be confounded. For example, Rubalcava et al. (2008) show that higher income in the hands of women led to improvements in nutrition and higher spending on child clothing using Progres, the Mexican cash transfer program. On the contrary, using a later version of the same program, Angelucci(2008) and Bobonis et al. (2007) find an increase in aggressive behavior and violent threats from husbands as increasing income for their spouses hurt their ego. The latter evidence casts doubt on the assumption that women had full control over the cash transfers. Under such circumstances, we cannot be certain that the improvement in nutrition is a consequence of greater control of women over the resources.

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<sup>1</sup>Female autonomy has been researched in various contexts. Some notable being (1) autonomy in household decision (Anderson and Eswaran, 2009, Kantor 2003), (2) autonomy in political participation in developing countries(Chattopadhyay and Duflo, 2004) and (3)autonomy in contraceptive use and labor market participation in the United States (Goldin and Katz 2000, Orefice 2007)

<sup>2</sup>See Kantor (2003) and Rahman and Rao (2004)

<sup>3</sup>These range from micro-credit lending, to reservation in the legislature to conditional cash payments.

We attempt to fill this gap in two ways. We first create a direct measure of female autonomy exploiting the rich nature of Mexican Family Life Survey Data. We then we examine the effects of such autonomy for mothers on their secondary school-going children. Our autonomy measure is based on household member responses and not inferential. We also try to establish a causal link between mothers autonomy and her childs education.

Obtaining a direct measure of female autonomy empirically is challenging, because the decision making process among family members, particularly the spouses, remains unobservable to the researchers. To resolve this problem, researchers have used transitory income or conditional cash transfer programs as proxies for female autonomy in reduced form estimations or have conducted randomized experiments to estimate the effects of a change in relative income on the intra-household distribution of resources. Thomas (1990) was one of the first to point out that income effects across gender may be different. There is a vast literature that followed - Lundberg et. al (1997), Hotchkiss (2005), Ward-Batts (2008) and Brown (2009) to name a few. Ashraf(2009) conducted a field experiment in Philippines where private and public behaviors of spouses were tracked to elicit differential spousal behavior. In a related literature, Folbre (1984) and Lee (2007), deals explicitly with women's bargaining power within the family. Anderson and Eswaran (2009) address this issue to some extent and find that income earned outside family farm generates greater autonomy. Unfortunately, a full evaluation of this literature is beyond the scope of our paper. To summarize, majority of these studies tend only to reject the unitary model of intra-household resource allocation, as propounded by Becker (1991), without uncovering the intra-household decision making process. Relative income, whether transitory or permanent, is only one of the many variables that may potentially affect power sharing within the household (Chaippori et. al. 2002). Spouses negotiate decision-making on a large number of variables. Reggio (2010), Jensen and Oster (2009) and Pitt, Khandker, Cartwright (2006) do use direct autonomy measures, but their focus and methodology are different.

We have tried to open the blackbox of female autonomy and look into the underlying dy-

namics between spouses, creating an autonomy index that is replicable in other settings. We create the female autonomy index using a unique survey design that collects information on each spouse's perspective on domestic decision-making on a set of variables. Mexican Family Life Survey (henceforth, MxFLS) interviews each adult in the family such that the husband independently gives his opinion about who makes the decision- himself, his spouse or both (likewise for his wife). The setting is ideal to measure female autonomy "defined as the ability of women to make choices/decisions within the household relative to their husbands"(Anderson and Eswaran, 2009). We have reduced the dimensionality of the decision matrix by taking the principal component of the same and creating an index for female autonomy. This approach has several advantages. First, it is a continuous, time-variant measure that gives a range of autonomy. Second, it takes on the issue of decision-making directly, instead of inferring from indirect proxy measures such as access to transitory or transfer income. Third, with more and more surveys asking such questions, this measure is easily replicable.<sup>4</sup>

Our paper also contributes to a related pool of literature - whether greater autonomy of women in exercising their preference is always beneficial for children. For instance, Duflo (2003) finds that a pension program in South Africa leads to better health outcomes for girls when the pension recipient is a woman. However, Edmonds (2005) shows the same program leads to better education outcomes for children in families where the pension recipient is a man. Putting dollars in the hands of women does not always lead to the desirable outcome. We also obtain mixed results on female autonomy - higher female autonomy does not always lead to outcomes more desirable from the developmental point of view.

We use our autonomy index to examine the effects of female autonomy on children's education, particularly enrollment and retention at the secondary school level. Mexico is at a stage

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<sup>4</sup>For example, Demographic Health Surveys (DHS) in several countries have been asking these questions for all its rounds in several countries. However, DHS asks these decision questions only to the female members of a family. In this paper we use female and mother interchangeably since we restrict our sample of children whose both parents are alive. The idea of using principal components for constructing an autonomy index can be extended to any woman within a family.

of development where, except for some remote rural areas, primary schooling has been almost universal. Primary enrollment is likely to be invariant to the parental characteristics. However, secondary enrollment and completion have lagged much behind primary enrollment and completion. Students have a tendency to drop out of secondary school (Angelucci et al., 2010). Therefore, mother's autonomy in family decision-making is more likely to influence secondary enrollment.<sup>5</sup>

We find that the benefits of greater autonomy of mothers are restricted to younger boys. For instance, our estimates suggest that if the decision regarding child's education is taken by mothers instead of fathers, decision-making on other variables remaining the same, the probability of dropout decreases by 1.62 percentage points for boys in the 10-14 age group.<sup>6</sup> However, we do not find any improvement in the education outcomes of girls or older boys, with greater autonomy of mothers. Our analysis also sheds light on the mechanism through which benefits from higher autonomy of mothers accrue differently to boys and girls. Boys seem to gain at the expense of girls within the mixed-sex-sibling families. There is no effect of autonomy on boys for families with only sons.

Our results are robust to a number of sensitivity analysis. Husbands' responses with regard to the extent of autonomy of their spouses can suffer from measurement errors. Husbands may want to look magnanimous in front of interviewer. To correct this, we generate the same index using the women's responses. The results are qualitatively and quantitatively similar. We also perform the same analysis using the simple average measure, as this is the common norm in the extant literature and serves as a baseline.

Finally, we also attempt to address the potential endogeneity problems. Interpretation of the effects of our autonomy index as a causal effect is tenuous because of the unobserved variables (such as personality of a woman) that may affect both outcome variables and autonomy. Our

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<sup>5</sup>In this paper we use female and mother interchangeably since we restrict our sample of children whose both parents are alive. The idea of using principal components for constructing an autonomy index can be extended to any woman within a family.

<sup>6</sup>Changing one decision leads to a change in the value of the index leading to a change in outcome variable. This is discussed in detail in section 5.

identification strategy consists of two parts. First, we exploit the longitudinal nature of the data by using lagged values for independent variables. Second, as a robustness check, we use instrumental variables to address the concern that the results might be driven by omitted unobserved variables. We use the relative geographical proximity of husband and wife's parents, as a determinant of mother's autonomy. This is a valid instrument if it induces variations in mother's autonomy but is uncorrelated with other individual characteristics that affect both female autonomy and schooling of children.

We do find that relative proximity significantly explains autonomy. The exclusion restriction is much more complicated. While proximity to only wife's parents is likely to raise her autonomy, it might also improve child outcomes independently through greater child care. To address this, we have used relative closeness to mother's vis-a-vis father's parents. Since there is no a priori reason why a child's paternal grandparent will care about her more(less) than her maternal grandparents, the relative proximity measure is likely to be exogenous care-giving. Further concerns regarding the exogeneity of the instrumental variable arise if individual characteristics determine both child outcomes and grandparental proximity. We utilize information on the birth location of grandparents to construct our instrument. To the extent that birth locations are exogenous, our model is identified by the correlation between birth location and current location of grandparents. We provide further evidence that, in Mexico, individuals do not principally move to relocate themselves close to family or to get away from them. Migration decisions are mainly driven by employment and education considerations. Overall, we argue that while relative grandparental proximity is a strong predictor of mother's autonomy, it is unlikely that variations in grandparental proximity are correlated with unobserved characteristics that affect child outcomes. However, owing to the strong assumptions made in this context, we report these results as part of sensitivity analyses.

These findings have important implications for the new trend in global development policy - conditional cash or in-kind transfers handed out directly to the female member of a family. This is particularly relevant in Mexico, where large sums of money are spent on programs like Progresa

(or the more recent Oportunidades), that are targeted towards women. Our results caution against these ambitious policies directed towards women. While we do find significant improvement in the education of boys when mothers have greater decision making power, our findings also suggest an apparent redistribution of resources from boys to girls in families with higher mother's autonomy. The relevant policy question is whether a shift in the control over resources from men to women would improve the welfare outcome of children. We show that it may not necessarily be the case even when the women in the family themselves choose how to spend the money.

The rest of the paper is organized as follows. We discuss the Mexican Family Life Survey dataset in the next section. We present the logic of using principal component analysis to form a measure of female autonomy in section 3. The following two sections specify our empirical model and identification strategy and discuss our empirical findings respectively. We conclude our paper by summarizing our findings and discussing their policy implications.

## **2 Data and Descriptive Statistics**

The dataset comes from the Mexican Family Life Survey (MxFLS) - a nationally representative longitudinal household survey in Mexico. There are two waves of the data. The first round of survey took place in 2002, and a sizeable proportion of individuals were tracked in 2005 resulting in a two-year panel.

The survey contains detailed information on a wide range of individual and household characteristics, including household demographics, dwelling characteristics, household financial and non-financial assets, household member income and education levels (thereby helping us construct parental education), household consumption and household labor supply. In addition, as expounded in more detail in the next section, the survey interviews each adult member of the household about various aspects of household decision-making allowing us to look into the black box of intra-household decision-making and power-sharing. Finally, there is information on spa-

tial characteristics such as municipality, locality and urbanity which we use to control for spatial effects.

Please insert Table 1 here

Table 1 provides some basic characteristics of the data. There are 8044 and 8114 households surveyed in 2002 and 2005, respectively. Approximately 20% of the households are female-headed suggesting that decision-making power within a family still lies mostly with men. Additionally, only 20% of the female household heads are married implying that women generally run households only in the absence of male members. This information is probably banal in the context of most developing countries, but supports the fact in our context that women lack autonomy in decision making as a cultural default and a variation in such autonomy and its implications are no trivial questions. Female household heads also have significantly lower education. While nearly 40% of the male household heads have secondary education, the number is only 27% for the female household heads. A similar trend is present for workforce participation. Roughly speaking, the female workforce participation rate is about half of the male counterpart. Together, these statistics show us that Mexican families surveyed here are similar to the general experience of gender imbalance in developing countries - women study less, work more at home, earn lower wage income, and are less likely to run families when a man is around.

Please insert Table 2 here

Table 2 profiles primary and secondary school enrollment for children aged between 5 and 16 years. Not surprisingly, primary enrollment is almost universal (more than 96%), but secondary enrollment has lagged behind, both for 2002 and 2005.<sup>7</sup> Interestingly, while the primary enrollment rate is slightly higher for girls in the age group of 10-12 years, it is less than the boys in the

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<sup>7</sup>This is consistent with the aggregate, country-level data reported by World Bank (WDI, 2010). According to this database, net primary enrollment was 97.22% and 97.78% respectively for 2002 and 2005. However, secondary enrollment was only 61.65% in 2002, but grew to 67.57% in 2005.



next age group of 13-16 years suggesting that proportionally more girls drop out at the secondary level.

### **3 Measuring Female Autonomy - A Principal Component Approach**

The MxFLS survey includes questions on various decision making aspects which are asked to both adult male and female members of the household. In our case, we consider decision-making only by the adult members who have children. In other words, we are interested in the decision-making of parents, and consequently, the welfare of their children. We consider the decisions made on the following 12 categories: household food consumption, husband's clothes, wife's clothes, child's clothes, child's education, child's health, expenditure on durable assets, transfers made to parents or relatives of the husband, transfers made to parents or relatives of the wife, husband's labor force participation, wife's labor force participation and the use of contraceptives.

Each household member is asked about his(her) perception of who makes the decision in each of these categories, but we focus only on the responses of the parents in cases where both parents are alive. Moreover, we construct the female autonomy indices based on the father's responses rather than the mother's perception. In other words, our index, Mother's Autonomy Index (henceforth, MAI) can be thought of as an indicator of the degree of autonomy the husband is willing to give his wife.<sup>8</sup>

For any parent-child-combination  $i$ , we assume that with respect to a particular decision category, female autonomy is strongest when husband( $i$ ) perceives that his wife( $i$ ) takes the decision in

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<sup>8</sup>MxFLS is somewhat unique in asking these questions to both husbands and wives. Other surveys such as DHS and ENADID in Mexico ask these questions to only the female members of the family. We believe that in a mostly patriarchal society (see our discussion about households being mostly headed by male members), a male member's perception about the decision making autonomy of female members is a more accurate measure of female autonomy than their own perception of self-autonomy.

that category. On the other hand, female autonomy is weakest when the husband(i) perceives that he himself takes the decision in that category. The perception that both are involved in decision making lies somewhere in between.

One way of computing an index would be to compute the average proportion of categories in which the husband thinks his wife makes the decision. However, this method assumes equal weight for all categories in determining overall bargaining power within the marriage, which need not be the case. For example, the husband can choose to let the wife decide on her own about her clothes, probably a less important category, but keep the decision on her labor force participation to himself. Hence we adopt an alternative strategy and let the variability in the data decide how much weight to put on each category.<sup>9</sup> For each decision category, we create a categorical variable that equals 3 when the husband thinks that his wife takes the decision, equals 2 when he thinks that both take the decision and equals 1 when he thinks that he takes the decision. We use factor analysis to determine the weights that each decision category is assigned, similar to Filmer and Pritchett (2001). We then use the first principal component as a measure of female autonomy as perceived by her husband. In our sample, the first principal component explains about 25% of the variability in the data.

### 3.1 Method

Intuitively, the principal components approach helps reduce dimensionality of the data, while capturing the underlying variability. It produces mutually orthogonal linear combinations (eigenvectors) of a set of variables that capture the common pattern in the data. The eigenvector that has the highest eigenvalue, (i.e. the linear combination that captures the highest variability) is the first principal component. Formally, the strategy underlying the principal component methodology is the following: Suppose we have  $k$  variables for  $k$  decision categories that together determine the

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<sup>9</sup>Nevertheless, we check the robustness of our results with average number of categories in which the mother makes decisions as a measure of her autonomy.

bargaining power of the spouse within the marriage. Consider the following linear combinations:

$$z_1 = a_{11} * x_1 + a_{12} * x_2 + \dots + a_{1k} * x_k$$

$$z_2 = a_{21} * x_1 + a_{22} * x_2 + \dots + a_{2k} * x_k$$

$$z_k = a_{k1} * x_1 + a_{k2} * x_2 + \dots + a_{kk} * x_k$$

Where  $x_k$  is the variable denoting who takes decision in the  $k$ th category. In our case,  $k \in \{1, 2, 12\}$  and  $x \in \{1, 2, 3\}$ . For example, suppose category two is child's education. Then  $x_2$  takes a value 3 only if the mother takes decision about her child's education. Likewise,  $x_2$  takes a value 1 for the household where only the father makes decisions about the child's education. Principal components maximize the variance  $V(z_1)$  subject to the restriction that  $a_1' a_1 = 1$ . The normalization of eigenvectors  $a_i$  to unity is done because if any  $z_1$  (eigenvalue) maximizes  $V(z_1)$  any other vector  $n z_1$  will also have the same property. Thus principal component analysis minimizes the sum of the squared perpendicular distances.  $z_1$  is called the first principal component and is the linear combination that has the highest variance. Similarly, way we can find the  $k$ th principal component, the vector  $X a_k$ , which maximizes  $z_k' z_k$  subject to the normalization  $a_k' a_k = 1$  and subject to the additional restriction that these principal components are orthogonal to each other. The variances of the  $k$  principal components decrease from 1 through  $k$  (i.e.  $V(z_{k-1}) > V(z_k)$ ).<sup>10</sup> Table 3 provides a summary of the index, the first principal component, in our sample. The mean value of the index is zero by construction. The standard deviation is 1.63. Recall that each decision category takes a value of 1, 2 or 3 depending on whether only father decides, both parents decide or only mother decides, respectively.

Please insert Table 3 here

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<sup>10</sup>An ad hoc strategy to construct an index of the mother's autonomy would be to set the weights  $a_{ij} = 1$  (for all  $i$  and  $j$ ) and then use the average of all categories. We use that index for testing the robustness of our results.

Thus, if a category moves from the 1 to 2 (or 2 to 3), the index increases by the amount of its weight. For example, the index of female autonomy increases by approximately 0.87 units when the decision about child's education is taken by both parents as opposed to only by the father. However, female autonomy is higher by  $(0.87 \times 2)$  1.8 units when the decision is taken only by the mother as opposed to only by the father. In other words, as explained before, the weights in column 4 indicate the relative importance of each category in the construction of the index, where they are themselves determined by their variability in the data. Thus, a child's education decision seems to be the most important variable with regard to female empowerment, followed by decisions about child health.

### 3.2 Validation

One way to validate whether our index truly reflects female autonomy within marriage is to check its association with other measures of bargaining power or female autonomy that have been used in the literature. While there is a dearth of direct measures of female empowerment, the literature on power sharing within marriage outlines several important correlates of female bargaining power viz. parental education, outside options (employment status) and parental age among other things.

Table 4 illustrates the relationship between various parental characteristics and our index of female autonomy. Specifically, if we compare the high (75th percentile) and the low (25th percentile) ends of the distribution of the female autonomy index, we find that in the households characterized by higher female autonomy, mothers are more likely to have completed secondary education, younger in age and slightly more likely to be employed. The same is true for the father's characteristics.

Please insert Table 4 here

However, we do not find a significant difference in urbanization between households with high and low female autonomy.

### **3.3 Mother's Autonomy and Child Education - Stylized Facts**

Given the evidence on the validity of our index, we next turn to our second question in the paper - whether mother's autonomy in decision making affects child outcomes. The basic idea behind our regression strategy is illustrated in table 5.

Please insert Table 5 here

As before, high and low are defined as greater-than-75th and lower-than-25th percentile of the distribution of MAI, respectively. It shows the differences in the percentages of enrollment for the children with high and low degrees of mother's autonomy in decision making. Enrollment drops significantly as children progress from lower to higher secondary. However, a comparison of rows 1 and 2 shows that the drop in enrollment is much higher for lower levels of Mother's Autonomy. For male children, while enrollment drops by 24 percentage points in households with higher Mother's Autonomy, it drops by 32 percentage points in households in the bottom 25% of the Mother's Autonomy distribution, similarly for girls.

## **4 Regression Specification and Identification Strategy**

### **4.1 Effects of Mother's Autonomy on her child's Retention in secondary school**

While the descriptive evidence in table 5 suggests that children with more autonomous mothers have a higher rate of secondary enrollment on an average, it does not imply that autonomy has any impact on children's education after controlling for other potentially important variables. Hence, we turn to a formal regression analysis.

We first look at the relationship between the secondary enrollment outcome of the students in 2005 and the lagged value of their mothers' autonomy from 2002 to ameliorate the simultaneity

problem.<sup>11</sup> However, this measure can be imprecise because it includes students who were never enrolled in the first place in 2002, the year from which the autonomy index variable comes. Therefore, we also look at secondary enrollment of students who are 10-14 years old in 2005 conditional on the criterion that they were enrolled in school in 2002, either primary or secondary. Accordingly, if a student is not enrolled in secondary school in 2005, then she is categorized as a *dropout*. We also control for several candidate alternative explanations cited in the literature such as wealth and parental education.

Formally we estimate the following two regression equations

$$E_{i,2005} = \beta_0 + \beta_1 * MAI_{i,2002} + X_i * \gamma + u_i, \quad (1)$$

$$D_{i,2005} = \alpha_0 + \alpha_1 * MAI_{i,2002} + X_i * \theta + e_i, \quad (2)$$

where for each individual child  $i$ ,  $E_{i,2005}$  and  $D_{i,2005}$  are the binary outcome variables enrollment and dropout respectively.  $MAI_{i,2002}$  is the measure of mother's autonomy within a family in 2002, and  $X$  is the matrix of control variables that includes various individual, parental and household characteristics such as gender, age, family wealth and parental education. Our main coefficients of interest are  $\beta_1$  and  $\alpha_1$  in terms of the direction, magnitude and significance of change. We also provide the marginal coefficients from the latent model to understand the magnitude of the effect. In the first specification,  $E_{i,2005}$  is equal to unity if the relevant child is enrolled in school in 2005; in the second specification  $D_{i,2005}$  is equal to unity if the relevant child is not enrolled in school in 2005, but was enrolled in 2002, either at the primary or at the secondary level.

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<sup>11</sup> Since our dependent variable is binary, using an individual fixed-effects model is problematic as pointed out by Fernandez-Val (2009). Further, in order to identify the within family effect, one would need to see two children in the family facing the enrollment decision, one in 2002, and one in 2005.

## 5 Discussion of Results

### 5.1 Secondary Enrollment

Probit estimates of the effects of mother's autonomy on child's secondary school enrollment status are shown in table 6. The estimates are provided separately for lower secondary (10-14) and higher secondary (15-16) age groups. The estimates in column 1 suggest that mother's autonomy is positively and significantly associated with enrollment in the lower secondary school. However MAI does not seem to matter for education status at upper secondary levels (column 4). As expected, enrollment decreases at higher ages. Father's education seems to be a robust predictor of overall secondary enrollment. Surprisingly, wealth, proxied by landholding, and holding parental education constant, does not have an effect on secondary enrollment.

Please insert Table 6 here

However, when we decompose the sample into boys and girls, only boys seem to benefit from greater autonomy of their mothers. MAI does not have a significant impact on secondary schooling for girls in either of the age categories. The marginal estimates corresponding to the probit estimates in column 2 are reported in column 1 of table 8. The estimates suggest that a 1 percentage point increase in MAI leads to 1.3 percentage point increase in probability of secondary enrollment for a child whose mother has mean MAI.<sup>12</sup>

### 5.2 Secondary Dropout

Table 7 reports the educational status of the child in 2005 conditional on the fact that the child was enrolled in school in 2002. In particular, our dependent variable is the probability of dropping out

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<sup>12</sup>All marginal effects are calculated at the mean value of MAI and the results are summarized in Table 8 to avoid clutter.

while still in the school going age. As before, columns 1-3 show results for children who are 10-14 years old and columns 4-6 show results for children who are 15-16 years old.

Please insert Table 7 here

Mother's autonomy index has a negative and significant impact on dropout from secondary school in the 10-14 age group but has no effect on higher secondary schooling. Again this result holds only for boys, not for girls. The marginal effects imply that a one unit increase in MAI leads to a 1 percentage point fall in the dropout rate (table 8, column 2).

## **6 Robustness Checks**

In this section, we perform a variety of sensitivity analysis to see if our results are robust to various alternative definitions of mother's autonomy. First, we discuss our proposed instrumental variable strategy in detail and discuss the results from these specifications. Second, we construct an index of mother's autonomy using two alternative approaches: (i) from the responses of the mothers and (ii) the average number of all categories in which the mother takes decisions within the family.

### **6.1 Instrumental Variable Estimates**

While using a lagged value of MAI by exploiting the panel structure of the data accounts for any concerns of simultaneity, it cannot address the possibility of omitted variable biases. To account for both measurement error and omitted variable biases, we construct an instrumental variable by combining insights from the other social science literature and the pattern of domestic migration in Mexico.<sup>13</sup> Our instrumental variable strategy is based on the twin observation that proximity to

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<sup>13</sup>The previous literature has used a wide range of variables as exogenous determinants of female autonomy or bargaining position of female within marriage. For example, Hoddinott and Haddad (1995) use relative income while Schultz (1990) and Thomas (1990) use non labor income as proxy for bargaining power. Others have used current or inherited assets (Doss 1999, Quisumbing 1994). Brown (2009) uses dowry to proxy for bargaining position and



natal kin increases female bargaining power within her family, and forces behind location choice of agents are exogenous to the autonomy-child education relationship. In particular, the MxFLS asks all adult household members whether their parents were born in the same locality (in geographic terms, this is a subcategory of municipality) as they currently live in or whether they were born in a different locality. Husband's parents are proximate if the couple lives in the same locality as where the husband's parents (either of the parents) were born. On the other hand, wife's parents are proximate if the couple lives in the same locality as where the wife's parents (either of the parents) were born.<sup>14</sup> We construct relative parental proximity as a categorical variable that takes the value 3 when only wife's parents are proximate, the value 2 when both the husband and wife's parents are proximate or none is proximate and the value 1 when only husband's parents are proximate. For example, we define wife's parents to be proximate (in absolute sense) when either the wife's mother, or her father or both live in the same locality. Husband's parental proximity is defined similarly.

Sociological and anthropological literature has long documented that proximity to the natal kin influences women's position within marriage. For example, Dyson and Moore (1983), argue that patrilocal kinship structures like village exogamy in marriage leads to lower autonomy of women. By contrast, matrilocal kinship systems endow greater autonomy to women. Yanca and Low (2004) and Chen (2004) provide evidence in different contexts that geographic proximity to the natal kin positively influences various indicators of female empowerment like control over household resources or household work arrangement. Therefore, empirically, relative proximity of the wife's parents should be positively correlated with her autonomy. However, to be a valid instrument, the proximity measure should be excluded from the structural equation - i.e. proximity should not directly affect the outcome variable, nor should parental proximity be determined simultaneously

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then goes on to instrument dowry by grain shocks. However, most of these methods make strong assumptions about exogeneity. Finally, there are studies that use changes in divorce laws or other exogenous policies to proxy for female bargaining position (Lundberg, et al., 1997; Chiappori et al., 2002).

<sup>14</sup>This is the minimum spatial unit in the survey.

with female autonomy.

It is conceivable that proximity to the wife's parents can improve child outcomes not only through her improved bargaining position but also through care-giving from maternal grandparents to grandchildren. On the other hand, proximity to husband's parents may have a similar independent effect on child outcomes other than the effect through the lowering the bargaining position of the wife. Our relative proximity measure, however, is likely to affect child outcomes only through MAI since there is no a priori reason to believe that there exists systematically differential care-giving to grandchildren from the two sets of grandparents.

To understand the other threats to the exogeneity of our instrument concerns, first consider the case that proximity to respective parents might be determined as a result of selective migration of spouses towards or away from their respective parents. However, investigating the reasons for movement within Mexico, we find that employment is the most important determinant of migration for the adult members of the household (please refer to Appendix Table A1). With motive of moving close to, or away from, family explaining only 1% of overall adult migration in Mexico, it is unlikely that our instrument of relative proximity is determined by systematic migration of spouses towards their respective parents. Moreover, note that for the instrument to be invalid, the husband (wife) must choose to relocate away from his own parents and specifically locate closer to his wife's (husband's) parents. In general, this appears to be a rare scenario.<sup>15</sup>

Finally, our IV would also fail if proximity is determined by the current location of grandparents who endogenously choose to move to a locality where adult sons or daughters currently live. For example, parents of a pro-active wife could choose to move close by raising her autonomy level. The omitted variable, "pro-activeness" of the wife might affect both parental proximity and child outcomes in this case.

In order to avoid concerns of endogenous living locations of grandparents, our identifying

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<sup>15</sup>We do not exclude those families because we wanted to avoid having a selected sample and to not lose sample size further.

instrument is based on the exogenous birth locations of grandparents. Since birth locations are arguably exogenous and are correlated with current locations of grandparents, our model is identified by this correlation of current locations to birth locations. We define husband's parents to be proximate if the couple lives in the same region as where the husband's parents were born. On the other hand, wife's parents are proximate if the couple lives in the same region as where the wife's parents were born.

We provide evidence on the “relevance” of our instruments in Table 9 - that relative parental proximity of spouses and MAI are correlated.

Please insert Table 9 here

Table 9 shows the effect of the relative proximity of wife's parents to husband's parents on the index of female autonomy. Relative proximity of wife's parents has a significant positive impact on the relative decision making power of wives and the coefficient remains unchanged with the inclusion of various controls. Moreover, as the last column shows, when we separate out the indicators of wife's parent's proximity and husband's parent's proximity, it is the proximity of the former that increases female autonomy; female autonomy decreases when the husband's parents live nearby (however, the coefficient is imprecisely estimated). Given that our relative proximity measure strongly predicts MAI we present Two Stage Least Square (TSLS) estimates of model (1) to allay any endogeneity concerns arising from unobserved heterogeneity.

The instrumental variable estimates parallel to our main results are reported in table 10. We restrict our attention to the younger age group, because as shown above, education outcomes at the higher levels remain indifferent to the variations in mother's autonomy.<sup>16</sup>

Please insert Table 10 here

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<sup>16</sup>Similar results are obtained from a linear 2SLS specification also. While we have not reported them here to avoid clutter, they are available upon request.

The IV estimates confirm that greater mother's autonomy leads to higher enrollment and lower dropout for boys. The marginal effects for the enrollment and dropout results are reported in columns 3 and 4 respectively of Table 8. To understand the magnitude of the effect, consider the dropout results in column 4. Overall, a one percentage point increase in MAI implies a 3 percentage point fall in the dropout rate. In particular, a shift in the decision making power from fathers to mothers, in the category of child's education for instance, reduces the probability of dropping out from school by 5.7 percentage points.<sup>17</sup> All IV coefficients are larger than their probit counterparts. Given the nature of potential omitted variable bias in this situation, it is not a priori straightforward as to which way the probit estimates will be biased. For example, suppose the omitted variable from equation (1) is the relevant student's IQ, a staple variable in the labor literature. It is not straightforward if this leads to higher autonomy for the mother (where the father wants to give more decision space to wife, or wants more autonomy for himself). However, since our IV estimates are bigger than the probit estimates for both outcome variables, it may be the case that for more able children, the father takes over the decision-making (so that the correlation between IQ and mother's autonomy will be negative creating a downward bias for the positive probit estimates). Contrary to the boys, IV results for girls in lower secondary school (Column 2, Table 10) imply that higher mother's autonomy leads to higher dropout rates for girls. At first glance this might appear to be counter intuitive. However, a closer look reveals that intra household dynamics might be driving the results. We deal with this issue in further detail in section 7.

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<sup>17</sup>To see this, note that from (1),

$$MAI = \sum_i w^i (d_3^i - \bar{d}_3^i) = \sum_i w^i d_3^i - \sum_i w^i \bar{d}_3^i$$

Let us consider the category education (i=5).

In this category,  $w_5 = 0.87$  (from author's calculation). If  $d_3^5$  changes from 1 to 3 (decision taken by father alone to decision taken by mother alone), then MAI increases by  $0.87 \times 2 = 1.8$  units. To see the eventual impact on dropout, let us consider the estimated marginal effect from the IV regression for boys in the 10-14 age group i.e. for  $\beta_1 = 0.322$ . i.e. a 10 percentage point increase in MAI results in a 3 percentage point reduction in the dropout rate. Therefore, a switch in decision-making power, for child's education, in favor of the mother leads to 5.7 ( $1.8 \times 3.2$ ) percentage points decline in the probability of dropout.

## 6.2 Index using mothers' responses

Evidence from MxFLS survey shows that not only are the actual decisions taken by different members of the family, but also perceptions differ with respect to who takes decision in particular categories. Hence the mother's response to questions of who takes household decisions do not necessarily match that of father's response. Therefore, we construct the same index using the mother's responses and estimate the same model. The results are presented in Table 11

Please insert Table 11 here

Table 11 is estimated in the same way as equations 1 and 2, controlling for all relevant variables as before. Results from Probit and IV estimations are reported in column (1) and (2) respectively. The results are qualitatively the same as before - greater autonomy of mothers leads to lower dropout for sons, and the IV estimates are higher than the Probit estimates.

## 6.3 Index using average number of categories

As discussed above, a more common approach in this literature is to work with average number of categories in which a mother makes the decision as a measure of her autonomy.<sup>18</sup> Panel B in Table 11 presents results from estimating the same model with the Mother Autonomy Index being calculated as proportion of cases in which the mother of a child takes decision alone.

Looking at Panel B and comparing the results with row 1 in Table 11, we see again that the results are qualitatively similar. Together, these tables show us that the positive causal relationship between greater autonomy of mothers and better lower secondary education of sons is robust to differences in the specification and definition of MAI. We next turn to investigate the gender differences in results.

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<sup>18</sup>See Jensen and Oster (2010) among others.

## 7 Discussion of Gender Differences in Results

While differences in outcome between boys and girls are not new in developing countries, the reason is often complex and specific to the underlying social, economic and institutional features. A comprehensive analysis of the conflict of gender interests for children is beyond the scope of this paper. However, one important question in the intra-household resource allocation is whether boys and girls compete with each other for resources. This effect can be confounded in the regression analysis comprising the entire sample as no distinction is made between families with single sex children and families that have both boys and girls in the secondary school age group. To test this hypothesis, we divide our sample between mixed-gender sibling families (families with at least one boy and one girl) and single-gender sibling families (families with male only or female only siblings). Then we estimate the same model, in (1), separately for them. Results from this estimation have been presented in table 12.<sup>19</sup>

Please insert Table 12 here

Column 1 shows results for mixed-gender families. These results are qualitatively similar to that of our main results in table 7. However, for columns 2 and 3, showing results for boys-only and girls-only families, mother's autonomy is not a significant variable in explaining dropout anymore. These results point out the possibility that higher autonomy for mothers, as opposed to the previous literature, leads to greater resource allocation to young boys within mixed-gender families.

## 8 Summary and Policy Implications

Economists and policymakers have long engaged in answering the question whether a dollar in the hands of a female member in the family has the same welfare effects as a dollar in the hands of a

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<sup>19</sup>We restrict our analysis to Probit estimates in this case, as the sample size is too small for meaningful IV estimations.

male member. Even though unitary household models, where the benevolent household head maximizes total household welfare and distributes among members, assumes away such distinction, some empirical evidence shows that female members spend money in a way that is more amenable to the welfare improvement of children. These studies have been influential in shaping development policies around the world that have directed cash or in-kind subsidy towards the female household members. However, unless we have a measure of female autonomy, we will not know the effectiveness of this line of policy-making. In other words, unless we know the true underlying relationship between women's involvement in household decision-making and child welfare, the effects of gender sensitive policies will be confounded. This paper fills this gap in two ways. We first create a direct measure of female autonomy exploiting the rich nature of Mexican Family Life Survey Data and then examine the effects of such autonomy for mothers on their secondary school-going children. Our autonomy measure is based on household member responses and not inferential. Our results are mixed. While we do find that greater mother autonomy is better for her child's education (children of mothers with higher autonomy have less dropout incidence and higher enrollment); we find that this effect is weak for older children and particularly for girls. In fact, boys seem to have significantly better outcomes in households shared by both male and female children. Our results thus caution policymakers that gender-directed policies may not necessarily hasten the process of equitable development.

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**Table 1: Characteristics of household heads in Mexican family life survey**

Variable	2002			2005		
	Male HH Head	Female HH Head	Total	Male HH Head	Female HH Head	Total
Age	46.2094 (15.1624)	51.8129 (16.5693)	47.344 (15.6198)	47.4051 (15.5882)	54.5806 (16.1963)	48.9135 (15.9866)
HH Size	4.4298 (1.9873)	3.4546 (2.0407)	4.2322 (2.0362)	4.7396 (2.2275)	3.9719 (2.402)	4.578 (2.2867)
Married Dummy	0.7799 (.4144)	0.1933 (.395)	0.661 (.4734)	0.7715 (.4199)	0.1786 (.3831)	0.6467 (.478)
Secondary and Above	0.4177 (.4932)	0.2748 (.4466)	0.3887 (.4875)	0.4288 (.4949)	0.2758 (.447)	0.3966 (.4892)
Working for Last 12 Months	0.8843 (.3199)	0.4859 (.5)	0.8036 (.3973)	0.8581 (.3489)	0.4501 (.4977)	0.7723 (.4194)
Land Owner	0.2109 (.408)	0.1393 (.3463)	0.1964 (.3973)	0.1733 (.3785)	0.1159 (.3202)	0.1612 (.3677)
House Owner	0.7741 (.4182)	0.7571 (.429)	0.7706 (.4204)	0.7938 (.4046)	0.7699 (.421)	0.7888 (.4082)
Observations	6414	1630	8044	6406	1708	8114

Note: Standard deviations are in parentheses

**Table 2: Primary and secondary school enrolment**

Age	All	Male	Female
5-9	.9602 (.1955) 3292	.969 (.1734) 1645	.9514 (.215) 1647
10-12	.9723 (.1642) 2704	.9691 (.1731) 1359	.9755 (.1548) 1345
13-16	.7802 (.4142) 3430	.7925 (.4057) 1696	.7682 (.4221) 1734

Notes:

1. Pooled data for 2002 and 2005
2. Each cell represents proportion of students enrolled.
3. Standard deviations are in parenthesis.
4. The third row represents numbers of observations.

**Table 3: Mother's Autonomy in different categories of decision-making**

	Scoring Factors	Mean	Std. Dev.	weights = Score/SD
MAI		0	1.63	
<b>Decision Category</b>				
Food	0.1249	2.4046	0.6815	0.1832722
Father's clothes	0.1341	1.6016	0.7912	0.1694894
Spouse's clothes	0.0812	2.6334	0.6418	0.1265192
Child clothes	0.4482	1.8556	0.7978	0.5617949
Child education	0.5036	1.8033	0.5749	0.8759784
Child health	0.4896	1.8238	0.5839	0.8384997
Durable expend	0.1961	1.6978	0.5666	0.3460995
Transfer to parents-relative	0.2579	1.4917	0.5705	0.4520596
Transfer to spouse parents-relative	0.2388	1.843	0.7238	0.3299254
Father LFP	0.1307	1.3706	0.5943	0.2199226
Spouse LFP	0.0491	2.0701	0.7937	0.0618622
Contraceptive	0.2901	1.7081	0.5511	0.5264017

Notes: The mean is the proportion of cases in which the mother decides when we define decision as a binary taking value one when only mother decides and zero otherwise

**Table 4: Characteristics of parents and relation to mother's autonomy**

	All			MAI high			MAI low		
Variables	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
M Age	16817	36.87	8.84	4210	35.65	8.14	4205	40.25	9.75
M Sec Edu	16836	0.42	0.49	4210	0.45	0.50	4211	0.32	0.47
M Employ	16836	0.26	0.44	4210	0.28	0.45	4211	0.23	0.42
F Age	16811	40.50	10.00	4205	39.31	9.42	4202	44.20	10.79
F Sec Edu	16836	0.46	0.50	4210	0.46	0.50	4211	0.37	0.48
F Employ	16836	0.96	0.19	4210	0.97	0.17	4211	0.94	0.24
Urban	16836	0.55	0.50	4210	0.56	0.50	4211	0.53	0.50

Notes: M represents Mother; F represents Father. M Age measures average age of mothers. M Sec Edu and M Employ indicate fraction of mothers with Secondary Education and Employment, respectively. Similarly for fathers. Urban indicates proportion of household located in the urban regions.



**Table 5: Relationship between MAI and secondary enrolment**

	MALE		FEMALE	
Age	10-14	15-16	10-14	15-16
MAI high	.9452 (.2278) 511	.7055 (.4574) 146	.9256 (.2627) 484	.7039 (.458) 152
MAI low	.9267 (.261) 341	.6077 (.4896) 181	.9277 (.2593) 401	.5896 (.4931) 212
One tailed P-value for				
$H_a: \text{Enrol}_{\text{MAI high}} > \text{Enrol}_{\text{MAI low}}$	0.13	0.03	0.54	0.01

Notes:

1. Standard deviations are in parenthesis.
2. The third row in each panel represents numbers of observation

**Table 6: Probit Results: Effects of mother's autonomy on secondary school enrolment**

Dependent Variable: Enrollment						
	10-14 All	10-14 Male	10-14 Female	15-16 All	15-16 Male	15-16 Female
	(1)	(2)	(3)	(4)	(5)	(6)
MAI	0.0812** (0.041)	0.158*** (0.058)	0.0179 (0.055)	0.0309 (0.040)	0.0489 (0.068)	0.0140 (0.051)
age	-0.234*** (0.037)	-0.175*** (0.056)	-0.286*** (0.050)	-0.391*** (0.11)	-0.517*** (0.16)	-0.295** (0.15)
Mother Edu	0.140 (0.13)	0.324 (0.20)	0.00234 (0.17)	0.632*** (0.14)	0.712*** (0.21)	0.619*** (0.20)
Father Edu	0.421*** (0.12)	0.492*** (0.18)	0.470*** (0.16)	0.411*** (0.14)	0.620*** (0.22)	0.241 (0.19)
Land owner	0.0336 (0.12)	-0.174 (0.16)	0.320* (0.18)	-0.0334 (0.12)	0.0486 (0.19)	-0.113 (0.17)
Male	0.115 (0.100)			-0.0194 (0.11)		
Constant	4.640*** (0.61)	3.270*** (0.89)	4.195*** (0.71)	5.895*** (1.66)	8.287*** (2.48)	4.873** (2.28)
Observations	1753	826	855	707	325	370

Notes: Robust standard errors are in parenthesis.

\*\*\* significant at 1%, \*\* significant at 5%, \* significant at 10%

**Table 7: Probit Results: Effects of mother's autonomy on secondary school dropout**

Dependent Variable: Dropout						
	(1)	(2)	(3)	(4)	(5)	(6)
	10-14 All	10-14 Male	10-14 Female	15-16 All	15-16 Male	15-16 Female
MAI	-0.0691 (0.042)	-0.149** (0.060)	-0.00817 (0.057)	-0.0227 (0.041)	-0.0628 (0.069)	0.00925 (0.053)
age	0.239*** (0.037)	0.179*** (0.058)	0.300*** (0.053)	0.354*** (0.11)	0.562*** (0.16)	0.174 (0.15)
Mother Edu	-0.129 (0.13)	-0.365* (0.21)	0.0421 (0.17)	-0.638*** (0.15)	-0.697*** (0.22)	-0.641*** (0.21)
Father Edu	-0.453*** (0.13)	-0.538*** (0.19)	-0.505*** (0.17)	-0.339** (0.14)	-0.588*** (0.23)	-0.144 (0.19)
Land owner	-0.165 (0.13)	-0.0128 (0.17)	-0.405** (0.19)	0.0616 (0.13)	0.00785 (0.19)	0.136 (0.18)
Male	-0.149 (0.10)			0.0254 (0.11)		
Constant	-4.685*** (0.62)	-3.663*** (0.81)	-4.364*** (0.75)	-5.461*** (1.71)	-8.658*** (2.56)	-2.680 (2.33)
Observations	1716	814	830	671	308	351

Notes: Robust standard errors are in parenthesis.

\*\*\* significant at 1%, \*\* significant at 5%, \* significant at 10%

**Table 8 : Marginal effects: Mother's autonomy on secondary school dropout**

	Probit		IV	
	Enrol	Dropout	Enrol	Dropout
MAI	0.013** (0.005)	-0.010** (0.004)	0.302** (0.134)	-0.322*** (0.075)
Age	-0.014*** (0.004)	0.012*** (0.004)	-0.022 (0.016)	0.022 (0.016)
Mother Edu	0.025 (0.015)	-0.024 (0.014)	0.016 (0.053)	-0.018 (0.051)
Father Edu	0.038** (0.014)	-0.036** (0.013)	0.098** (0.039)	-0.102* (0.041)
Land Owner	-0.015 (0.015)	-0.001 (0.012)	-0.066 (0.047)	0.056 (0.047)
Urban			-0.022 (0.076)	0.038 (0.059)
Observations	826	814	507	502

Notes: Robust standard errors are in parenthesis.

\*\*\* significant at 1%, \*\* significant at 5%, \* significant at 10%

**Table 9: Determinants of mother's autonomy – First Stage**

Dependent Variable: MAI in 2002					
	(1)	(2)	(3)	(4)	(5)
Relative Proximity	0.102*** (0.037)	0.0922** (0.037)	0.0998*** (0.037)	0.0805** (0.037)	
Mother Edu		0.0865*** (0.02)	0.0801*** (0.02)	0.0717*** (0.021)	0.0516*** (0.016)
Father Edu		-0.0353** (0.017)	-0.0474*** (0.018)	-0.0435** (0.018)	-0.0360*** (0.013)
Urban			0.186*** (0.057)		
Land owner				0.0232 (0.067)	-0.0279 (0.059)
Matrilocal					0.0947** (0.048)
Patrilocal					-0.0748 (0.048)
Constant	0.472*** (0.078)	0.322*** (0.1)	0.284*** (0.1)	0.939*** (0.23)	0.935*** (0.14)
Observations	2198	2198	2198	2198	3137

Notes: Robust standard errors are in parenthesis.

\*\*\* significant at 1%, \*\* significant at 5%, \* significant at 10%

Matrilocal is an indicator that wife's parents are proximate. Patrilocal is an indicator that husband's parents are proximate. Relative Proximity is defined as a categorical variable taking value 3 if only wife's parents are proximate, 1 if only husband's parents are proximate and 2 if both parents are proximate.

**Table 10: Robustness Checks:**

**Instrumental variable results: Effects of mother's autonomy on secondary school enrolment and dropout**

	10-14 Male	10-14 Female
	(1)	(2)
MAI	0.891*** (0.072)	-0.749** (0.30)
Dependent Variable: Dropout		
MAI	-0.900*** (0.051)	0.814*** (0.13)
Observations	507	517

Notes: Robust standard errors are in parenthesis.

\*\*\* significant at 1%, \*\* significant at 5%, \* significant at 10%

**Table 11: Robustness Checks:****Results from alternative construction of the Autonomy Index**

<b>Dependent variable: Dropout(Male: 10-14 Years)</b>		
Panel A: Mother's response		
	(1)	(2)
	<b>Probit</b>	<b>IV</b>
MAI	-0.126*	-0.952***
	(0.07)	(0.055)
Panel B: Proportional measure		
MAI	-0.0811*	-0.494***
	(0.042)	(0.026)
Observations	795	486

Notes: Robust standard errors are in parenthesis.

\*\*\* significant at 1%, \*\* significant at 5%, \* significant at 10%

All control variables from Table 7 are included in the estimation, but not reported to avoid clutter. Similar results are obtained for enrolment also.

**Table 12: Sibling sex composition and the effects of MAI on dropout**

Dependent Variable: Dropout			
	Mixed Sex Sibling	Same Sex Sibling	
	10-14	10-14	10-14
	Male	Male	Female
MAI	-0.140** (0.062)	-0.0745 (0.13)	-0.0977 (0.12)
age	0.133* (0.073)	0.291*** (0.095)	0.271*** (0.067)
Mother Edu	-0.447* (0.27)	-0.267 (0.33)	0.101 (0.24)
Father Edu	-0.325 (0.26)	-0.732** (0.35)	-0.264 (0.25)
Land owner	0.0132 (0.20)	-0.251 (0.36)	-0.742** (0.33)
Constant	-2.817*** (0.86)	-4.870*** (1.19)	-4.551*** (0.85)
Observations	480	396	399

Notes: Robust standard errors are in parenthesis, \*\*\* significant at 1%, \*\* significant at 5%, \* significant at 10%  
 Similar results are obtained for enrolment also.



**Appendix Table 1: Motivations for migration in MxFLS**

	Male	Female
Education/training of any home member	11.44	9.48
Going back to place of origin	7.03	4.97
Job of any household member	56.26	40.24
Marriage/union	4.9	23.27
Pregnancy	0.05	0.37
Death of the spouse/couple	0.16	0.33
Somebody else's death	0.63	1.02
Own or spouse's/couple's health	1.05	1.11
Health reasons of somebody else	1.03	1.82
To be closer to the family	7.31	7.45
For insecurity reasons	0.75	0.84
Because of political issues or disturbances	0.3	0.06
To be independent from your family	1.28	1.11
Like that place	2.45	2.21
Natural disasters	0.4	0.31
Deported	0.26	0.08
Other	4.69	5.34

Notes: Figures in each cell indicate the percentage of individuals, male or female, who migrated due to the corresponding reason.