

Beyond Financial Resources: The Role of Parents' Education in Predicting Children's Educational Persistence in Mexico

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Abstract

Despite significant educational expansion in recent decades, Mexico's educational attainment rates are relatively low. Though primary school enrollment is at nearly 100%, less than half of adults ages 18-29 have finished upper secondary school. The current study examines how family-level factors, including parental education and household wealth, influence the likelihood of children dropping out of school early in Mexico. This article examines the role of both mother's and father's education in predicting children's educational persistence – and how this varies for boys and girls – using data from the *Encuesta Nacional de Deserción en la Educación Media Superior* (n=12,982), a nationally representative sample of high school aged youth in Mexico. Results indicate that increases in parental education decrease the likelihood of children dropping out, even when controlling for financial resources and other family-level characteristics. Notably, mother's education appears to have distinct and additive effects on their children's educational persistence.

Introduction

Despite sweeping educational expansion over the last few decades, educational attainment in Mexico remains relatively low. Less than half of adults ages 18-29 have finished upper secondary school, the U.S. equivalent of high school (Kattain & Szekely 2015). Mexico, a country that has recently made the shift from a low- to a middle-income country, has a growing economy that will need highly-skilled workers to continue to accelerate the country's growth (Rapoza 2014). Still, a large portion of the Mexican population do not finish upper secondary school – a necessary precursor to obtaining higher levels of education – despite educational expansions in Mexico that have led to increased primary school enrollment and completion. Trends across the world in the last half of the twentieth century show an increase in primary education, but translating this increase into enrollment and completion of secondary and tertiary school will likely take additional generations to accomplish (Wils and Goujon 1998).

Though students spend most of their time outside of school (Walberg 1984), much research primarily focuses on institutional or school influences on educational outcomes. However, family-level factors are particularly powerful forces in the lives of school-age children, as these contexts make up children's environments for most of their waking hours. The present study examines the role of parental education and family-level influences in predicting children's educational outcomes by focusing on the differential influence of each (and both) parent's level of education on children's educational outcomes in upper secondary school, highlighting the distinctive roles that mothers play in the lives of their children. Further, this study uses an innovative methodological approach. In a cross-national assessment of different approaches on how to model parental education effects on men and women's attainment, Tomescu-Dubrow and Domanski (2010) find that including both parents' education within the same model yields the best results for explaining educational attainment. The current study uses this method. Further, while previous research has documented the positive correlation between increases in mother's education level and children's likelihood of remaining in primary school within the Mexican context (Schmelkes et al. 1996), research examining the role of mother's education on *secondary* school persistence remains somewhat limited.

The current study examines how family-level resources, including parental education and household wealth, influence the likelihood of children dropping out of school early in Mexico. I empirically assess key questions relating to the influence of family-level factors on children's educational persistence. The primary focus of this article is on the following research questions: 1) Does parent education matter for children's educational persistence? 2) Are there differences in the level of influence between mother and father's education on their children? 3) If differences exist, is this primarily a function of economic resources? And, 4) How does parent education matter for boys and girls? I will test these hypotheses in Mexico using the Encuesta Nacional de Deserción en la Educación Media Superior (EDEMSS), a nationally representative survey conducted by the Mexican government in 2011, with a large sample (n=12,982) that includes enrolled and non-enrolled students. Results indicate that increases in parental education decrease the likelihood of children dropping out, even when controlling for financial resources and other family-level characteristics. Notably, mother's education appears to have distinct and additive effects on their children's educational persistence.

Background

Parents' education

Empirical research across multiple contexts has documented a long-established relationship between parents' schooling and children's educational outcomes. Increased parental education positively influences children's education through multiple pathways, including: increased financial investment, social resources, and cultural resources.

Broadly speaking, parent education significantly increases the likelihood that children will progress from one level of schooling to the next in Mexico (Creighton and Park 2010). Valdez and colleagues (2008) find lower levels of parental education among students who drop out early. In this study, financial burdens, low grades, and lack of interest were the top reasons for students leaving school early. Although students indicated that they wished they had more education, very few had plans for enrolling in school again, partly due to lack of clear institutional pathways for doing so (Valdez et al.

2008). Further, in a study of Mexican secondary school dropout, Gibbs and Heaton (2014) find that parental education and father's employment account for children's education, controlling for other contextual factors. Parental education is significantly and positively associated with children's educational persistence (Kandel and Post 2003).

Higher levels of parent education are particularly important for children's educational outcomes because parents are increasingly able to invest in their children's education. Higher educated parents have access to better paying jobs and higher incomes needed to invest in children's education, particularly at crucial stages of the early life course (Duncan and Murnane 2011). Higher levels of parent education are also associated with greater educational expectations for their children (Davis-Kean 2005). These expectations may then be transferred to their children's decisions regarding their own education.

As parent education increases, access to financial resources that provide more educational opportunities for children also increases (Cochrane et al. 1982; Heyneman & Loxley 1983; Vikram et al. 2012). Economic resources provided by parents predict educational outcomes during adolescence, although this effect is in part mediated by parents' expectations for their children (Faas et al. 2013). Still, despite the clear link between increased parental education and greater financial resources, parental education has long been associated as a predictor of children's educational attainment, even when controlling for household resources and other indicators of wealth (Dubow, Boxer, and Huesmann 2009).

Although increased parental education is associated with more financial resources that parents can then pour into their children's education, parental education matters through other pathways, including social capital. Social capital includes an understanding and knowledge of information channels, as well as norms and effective sanctions (Coleman 1988), which can help parents know how best to assist their children persist in and perform well in school. Further, research indicates that social capital within the family is predictive of children's educational attainment (Myroniuk, Vanneman, & Desai 2017).

Thus, parents' education matters for more than the increased financial resources it brings. the acquisition of social capital can lead to the attainment of cultural capital: an understanding of specific norms, values, and knowledge that is associated with specific groups or classes (Coleman 1988).

Bourdieu (1977:175) describes the purpose and power of cultural capital as “instruments for the appropriation of symbolic wealth socially designated as worthy of being sought and possessed.” Lareau’s (2011) concepts of concerted cultivation and the accomplishment of natural growth also highlight the importance of social and cultural capital as important products of parent’s social class (as measured by level of education) that allow them to navigate educational and institutional structures more effectively. Therefore, parents’ educational attainment influences children’s educational attainment through multiple pathways beyond increased financial resources.

Father’s vs. Mother’s Education

Father’s and mother’s education may have different effects on their children’s education, particularly due to the different roles that fathers and mothers play within their families. Although this has begun shifting within recent decades, men have historically been the primary breadwinners and financial providers for their families. Consequently, fathers’ educational attainment mattered for measuring household income and wealth – as educational attainment has historically been highly correlated with earnings (Blau and Duncan 1966; Haller & Portes 1973). Increased father’s education has long been associated with higher levels of positive social mobility, as well as increased educational attainment for children (Blau & Duncan; Sewell et al. 1969). Fathers also have a large influence on their children’s health, education, and behavioral outcomes (Abuya, Elungata, Mutisya, & Kabiru 2017).

In turn, women have primarily borne the burden of childcare and development, and mothers are often the parent most involved in children’s educational development (Pudrovska 2008). However, societal and economic shifts have also led to increasing women’s labor force participation. Further, the availability of increasingly effective contraceptive methods has led to greater female autonomy in determining the timing of first birth (Jejeebhoy 1995). These shifts have led to greater numbers of women getting a higher education and recent research indicates that, in many educational outcomes, women have not only reached parity but also are beginning to surpass men’s achievements (Buchmann & DiPrete 2006). Further, while father’s education is often used as a proxy for social class, the inclusion of

mother's education in studies actually reduces the effect of fathers on their children (Korupp, Ganzeboom, and Van der Lippe 2002).

While research largely focuses on children's final educational attainment, less research examines these same theories at earlier stages in the life course – in this case, educational persistence or attrition during high school. Because educational attainment and future occupational status are inherently influenced by whether students can obtain a high school education – a necessary precursor for enrolling in most universities and for obtaining many jobs in the contemporary labor market – it is worth studying the role of mother's education at this stage of the life course. Recent research indicates that an increase in mothers' educational attainment leads to higher educational expectations (Augustine 2017). Mother's socioeconomic background, including education and occupation, has a substantial influence on predicting children's educational attainment (Korupp et al. 2002). Mothers' class status appears to be particularly influential in predicting sons' outcomes (Beller 2009). Maternal education is also an important predictor of children's educational attainment and, consequently, future earnings (Dubow, Boxer, and Huesmann 2009).

Maternal education is positively associated with children's educational outcomes in the context of Mexico. In a case study of the quality of primary school in the Mexican state of Puebla, increases in mother's education are associated with higher likelihoods of children remaining in and completing primary school (Schmelkes et al. 1996). Higher maternal education is also positively associated with an increase in children reading books, particularly for those that are the most socioeconomically disadvantaged (Fernandez-Ruiz 2009). While mother's education is particularly influential in staving off the risk of early dropout at earlier stages in the life course, this effect decreases over time (Gibbs & Heaton 2014). Still, each additional year of mother's education is positively associated with higher likelihoods of enrolling in and completing upper secondary school (Sawyer 2016). Other research indicates that increased female autonomy of mothers (often a product of higher levels of education) is associated with higher levels of secondary school enrollment for their children (Chakraborty & De 2017). However, this is only true for boys.

In addition to positive educational outcomes, mothers' education also shapes children's social and health outcomes. Multiple studies indicate that in low- and middle-income countries (LMICs), maternal education is a particularly important predictor of children's health and is associated with many positive health benefits for children, including lower mortality rates (Quamruzzaman, Rodriguez, Heymann, Kaufman, & Nandi 2014; Cochrane et al. 1982; Bicego and Ties Boerma, 1993; Caldwell and McDonald 1982; Hobcraft 1993; Boyle et al. 2006). Mother's education matters for children's health, largely because of the increased human and cultural capital that allow mothers to access better care for their children (Vikram, Vanneman, & Desai 2012). These positive outcomes may be associated with an increase in women's autonomy that then leads to greater decision-making power for their children in the household. In fact, this research has informed many government cash transfer programs (discussed below) that specifically focus on the role of the mother within the child's life (Chakraborty & De 2017).

Parents' Influence for Boys and Girls

As investment patterns may differ depending on the gender of the child, we might expect that parents' education operates differently for boys and for girls. This is particularly true in LMICs, contexts where economic and social change have permeated many institutions – all while some gendered norms regarding education and work have remained. As women have historically been seen as the primary caretakers of children and men the primary breadwinners, differential investments and access to resources across the gender of children in a household would thus follow. As parents' education operates through financial, social, and cultural pathways to influence children's educational outcomes, differences in parent education may then lead to differences in parental investment in children.

Children's educational persistence may be a product of parents modeling specific types of behavior – in this case, attitudes or feelings about the importance or value of an education. Recent research reveals that individual parental socioeconomic background, including education and class, has differential effects on children across gender over the life course. While mother's education is particularly influential for children's achievement during their infancy, this effect is smaller over time, with father's

socioeconomic background being particularly influential in early adulthood (Erola et al. 2016). Further, additional research indicates that boys are particularly negatively influenced by absent fathers (Buchmann & DiPrete 2006).

Still, at a time when in many contexts women have not only reached parity with men in education but are outpacing their male counterparts (Becker et al. 2010), the role of women's education may be especially influential for their children. As women's educational achievement has continued to surpass that of men, mother's modeled behavior may increasingly influence children. These changing trends warrant further attention to understand how parents' education might matter differently for their children – and how these effects may be different for boys and girls.

Within the context of Mexico, family structure and economic background play an important role in predicting children's educational persistence – and these effects vary by gender. Intergenerational mobility processes appear to be particularly gendered within Mexico, where women are more likely to stay poor if they come from poor families – and where advantages are often given to boys rather than girls in the household (Torche 2015). In households with a labor migrant, girls receive greater economic resources while the labor migrant is away; however, when the labor migrant returns, boys receive more resources in the household (Antman 2015). Further, in a study of educational expectations in Mexico, mothers' expectations for daughters' schooling strongly predicted their educational decisions. This pattern did not hold for boys (Attanasio & Kaufmann 2014).

An in-depth, qualitative study conducted in Mexico in recent years reveals that unpaid caregiving by working mothers in the household negatively affects their education and work opportunities. Further, daughters within the household are also negatively influenced by unpaid care work within the household (Bergstrom & Heymann 2005). These results are underscored by the fact that while young men may leave school early to enter the labor market, young women often leave school early in order to help with household responsibilities (Giorguli-Saucedo 2002).

Previous research notes that the level of education of mothers and fathers influence their children in different ways. Thus, while overall effects of parents' education are important to consider, the benefits

of parents' education may be differentially distributed across children in the household according to gender.

Study Setting

The Mexican education system includes three years of pre-school (pre-primary), six years of primary school (grades 1-6), three years of lower secondary school (grades 7-9), and three years of upper secondary school (grades 10-12), in addition to post-secondary universities (Magaziner and Monroy 2016). In 1997, the Mexican government rolled out *Oportunidades* (originally called PROGRESA), an innovative, wide-scale government cash transfer program that gives grants to low-income mothers in order to offset the real and opportunity costs of sending their children to school and reduces the cost of medical care (OECD 2013). Money is given specifically to mothers, rather than fathers, in order to make sure the money makes it to their children, rather than to other household expenses (OECD 2013). Longitudinal studies of the program find that increased exposure to the program increases educational attainment (Behrman et al. 2005). Due to the success of this program and educational policies that made primary education compulsory, primary school enrollment is virtually 100% in Mexico.

A later policy in 2002 made enrollment in pre-primary education compulsory, and as of 2011, most Mexican children were enrolled in these programs (Magaziner and Monroy 2016). Although recent policy changes called for 12 years of mandatory education, aiming to include secondary school, currently, more than half of youth in Mexico do not complete high school (OECD 2017). This is particularly concerning given that a lack of access, resources, and income is often pinpointed as the reason for low educational attainment in low-income countries (Filmer and Pritchett 1999). The general assumption is that once individual countries continue to develop economically and make the transition to high-income countries, low educational attainment will be an artefact replaced by increasing levels of education among the population. The fact that Mexico, now a middle-income country, still has incredibly low rates of attainment despite increased access to resources and education reforms makes it worth focusing on this specific country. Results from Mexico can further inform our knowledge of additional barriers to

educational attainment and what mechanisms drive it – particularly in the face of large government programs aimed to offset costs.

Access to resources differs across race and ethnicity, gender, and socioeconomic status; each of these ascribed characteristics and other factors are potential barriers to education (Altamirano, Lopez-Calva, and Soloaga 2011). Similar to other low- and middle-income countries, educational reform has focused on children starting school earlier and persisting through primary school. However, there remains a large portion of youth who “choose” to leave school in high school – though this choice may be a result of constrained agency and, in fact, due to lack of resources and other social and economic barriers. Descriptive statistics indicate that socially structured barriers to education play a role – marginalized (low-income, indigenous) youth are more likely to leave school early (Altamirano, Lopez-Calva, and Soloaga 2011). I will explore how these dynamics differ across gender and indigenous background. The transition from primary to secondary school is a major turning point when significant portions of students leave school. The current research is not clear on what mechanisms drive this severe truncation in children’s educational attainment. Still, these results highlight the importance of studying the role of mother’s education on children’s educational persistence, especially within contexts where the role of mothers (and women, more broadly) has changed dramatically – and in many ways, remained the same – over recent decades.

Current Study

In the following study, I analyze the qualitative differences in family background and parental education between students who persisted in upper secondary school and those who dropped out of school early. Seeking to address current gaps in the literature, I focus on the role of mothers (and specifically their educational attainment) on their children’s persistence in school. Using a dataset that has extensive information on both students who are in school and those who are not (Buendia & Laredo), I examine the differing relationships between parents and their children according to child’s gender – and how family

contexts influence educational persistence. I focus on the distinct and additive effects of mother's education, in addition to father's education – a measure that has historically been used as a proxy for social class (Blau and Duncan 1967). This is also a move away from using a standard measure of parental education, in which the education of the most educated parent is used.

This study moves the field forward by contributing to our understanding of family-level influences on children's educational outcomes in important ways. The current study tests the importance of parental education using the time point at which parents left school. Further, the results suggest that role modeling may be a part of the educational persistence process and that financial resources do not explain attainment completely.

Testing the different effects of maternal and paternal education is also an important contribution to the literature, particularly because results suggest that maternal and paternal roles and responsibilities may matter differently for education. I test these ideas, controlling for household wealth and receipt of education-related financial resources, to see if parental education matters net of economic resources. Lastly, the results detailed below address gaps in the research concerning the role of mother's education in LMICs, as well as inform broader U.S. theories of social stratification and mobility.

I hypothesize the following:

Hypothesis 1: An increase in parents' education, when controlling for household and economic resources, will be positively associated with children's likelihood of staying in school.

Hypothesis 2: Mother's education will have distinct and additive effects on children's educational persistence.

Hypothesis 3: Mother and father's education will have distinct effects on children's educational persistence for sons and daughters.

Data and Measures

Data

I use data from the Encuesta Nacional de Desercion en la Educacion Media Superior (EDEMMS), a nationally representative survey of high-school aged youth conducted by the Mexican government. EDEMMS is a cross-sectional, individual-level survey (taken in 2011) that specifically focuses on gathering rich information for analyzing reasons for dropping out or staying in school for Mexican youth. The full sample (n=13,014) consists of three different groups: youth who entered high school but dropped out, youth who entered high school and finished or remain enrolled, and students who are not currently in high school and/or dropped out before entering high school (Buendia & Laredo).

Contrary to other educational datasets, this survey captures both students who are in school and have since dropped out. This is a strength of using this dataset for my analysis, as many educational surveys are administered within the structures of schools, making it particularly difficult to include students who have dropped out. Thus, is optimally suited to test how family-level factors, netting out financial resources, influence upper secondary school drop-out.

Sample

Because I am interested in drop-out and early attrition for those eligible for enrollment in upper secondary school and higher, I use full sample of students in my analysis. The age range for students in the full sample is from 14-25. While the Mexican education system does not have as rigid age norms for entering specific academic grades as the United States, I use “14” as the standard benchmark for when an on-time student would reach upper secondary school (Kattain & Szekely 2015). Thus, this retains all students in the sample, and I control for age in the analysis (as discussed below). I include all students where my outcome variable (dropping out vs. remaining in school) is not missing. This results in only a slight change to my final sample size of 12,982, where only 32 students were dropped because of missing information on the outcome.

The table below (Table 1) presents initial descriptive statistics for the full sample and separately for boys and girls. Of the students in the full sample, 33.8% had dropped out of school early at the time the survey was administered. Additionally, the sample is split about evenly across gender, with females

making up 53.2% of the sample. Nearly one-fifth of the sample received Oportunidades, a conditional cash transfer program to help offset the costs of school. About 20% of the sample received an academic scholarship of some kind during their time in school. Most of the sample have parents who have a middle school (lower secondary school) education or lower. Further, most of the sample lives with both biological parents (79.3%) and the mean household size is about five individuals. Additional controls, including measures of child's age and household wealth are also included in the models; further information is found in Table 1.

[Table 1 here]

Missing Data

To handle missing data for my key variables and controls, I used multiple imputation software in Stata, specifically using chained equations with the *ice* command. Multiple imputation divides the full data set into m smaller and separate data sets, allowing for pooled m parameter estimates for the missing values in the full sample (Acocck 2005). Following recommendations in the literature (Royston & White 2011), I ran 25 imputations for my data. Most of the variables had less than 1% missing data, with receipt of Oportunidades missing 2%, father's education missing 8.9%, and mother's education missing 5.4% of the data. Wealth measures were missing on 46% of the data; these rates are similar for the income information. I use multiple imputation to include wealth measures, rather than income measures, due to its generally greater accuracy (Filmer & Pritchett 2001) within developing country contexts.

MEASURES

Dependent Variable

I use students' persistence in school as my main outcome. I constructed a binary variable where those who left school early are coded as 1, and those that remained in high school is coded as 0. I coded high school retention as a binary variable due to the variable's original construct and thus, I use logistic regressions to model the probability of dropping out of school early.

Independent Variables

My main independent variables are mother's education and father's education. These are two different categorical variables and I include both in my model, rather than one measure of parental education. Both variables are coded in identical ways. While each parent's education was originally coded in the survey using nine different categories ranging from "didn't finish primary school" to "Postgrad: master's or doctorate (start or finish)," I conducted multiple cross-tabulations and preliminary models to examine how distinct each of these categories are. I chose the following five categories because they appeared to be the key turning points and where there was the most statistical difference in outcomes. As such, I recoded each variable to have five distinct categories instead for parents' educational attainment: primary or lower, started lower secondary but did not finish, finished lower secondary, high school (start or finish), and college and higher.

Control Variables

I include a number of sociodemographic and other control variables in my regression models. First, I include child age and gender as standard controls in every model to account for differences in age and experience across the life course as well as gendered experiences. Age is a continuous variable with ages ranging from 14 to 25. Gender is a binary variable that is coded 1 for female and 0 for male. I also include controls that account for family structure: whether children live with both parents, as well as household size. Whether children live with both biological parents is a binary variable that is coded 1 if this condition is met and 0 if it is not. Household size is a continuous variable with number of people living in the child's household ranges from 1 to 12 and up.

Lastly, I include measures of wealth as well as other education-related financial resources. For the measure of wealth, I employed principle components analysis (PCA) to construct a wealth measure from 15 different binary variables that indicated household measures of wealth, including whether a family owned a gas stove, if they owned a landline telephone, etc. (Filmer and Pritchett 2001). I used the PCA score from the first component. Worth noting is that my results did not change when I accounted for

household monthly income. As noted in the data section above, I accounted for missing data in this variable by conducting multiple imputation across all independent variables. To account for education-related financial resources, I included measures of whether students' families received Oportunidades, a conditional cash transfer meant to offset the costs of education, as well as whether students received an academic scholarship. Both variables are binary indicators, where "1" indicates that they received these financial resources and "0" indicates that they did not.

METHOD

Analytic Strategy

I use logistic regression models to examine the likelihood that Mexican youth who have entered high school will drop out early. Given that the outcome is coded as a binary variable, this type of generalized linear model is best suited for my analysis. As access to resources and educational opportunities varies in Mexico across region, I use regional fixed effects (Stock and Watson 2008) in each of the models listed below. I use regional fixed effects to compare people in the same region, specifically netting out unobserved differences in educational expectations, aspirations, and access across geographic space among regions in Mexico.

Further, I adjust standard errors by clustering by *municipio* (district) in each of my models to account for people living in the same district. Lastly, I applied individual-level weights to all analyses. The base model equation (Model 1) for the analyses is listed below, with each additional model adding in additional variables, including household wealth and financial resources.

$$\log\left(\frac{\pi}{1-\pi}\right) = \alpha + \beta_{Father'sEd} + \beta_{Mother'sEd} + \beta_{female} + \beta_{Child'sAge} \\ + \beta_{LiveswithBothParents} + \beta_{HouseholdSize} + \beta_{Indigenous\ status} + \beta_{Region}$$

To test the hypotheses previously mentioned, I run a variety of models. I use odds ratios for ease of interpretation, and calculate these by exponentiating the coefficients (betas) in each of the models. In

the following results section, I include tables with each of these models using the full sample. The analytic strategies for Models 1 through 7 are detailed below; each of these models are clustered by *municipio* (district) for robustness.

Models 1-3: Mother and Father's Education

Models 1 through 3 are a nested regression, where each model include additional variables added to the previous model. Model 1 is a regional fixed effects logistic regression predicting the likelihood of students dropping out of school early, using both mother and father's education as the primary predictor as well as all controls. I use this model to predict the effect of both mother's and father's education on children's educational outcomes, as measured by early drop-out, independent of household wealth. Model 2 includes the PCA measure of household wealth. Model 3 includes receipt of *Oportunidades* and individual scholarships, to account for the effect of education-related resources.

In additional analyses, not included here¹, I also modeled mother and father's education separately in different models. Results listed here are consistent with those that had mother and father's education in separate models. That is, both parents' education continues to be significant and the effect sizes remain constant. These models are available upon request.

Models 4-7: Models stratified by gender

Due to previous models that included interaction terms between parent's education and child gender, I include the same models indicated above, stratified by gender. Both interactions (gender x mother's education, gender x father's education) were significant overall in early models, not shown here. These results are available upon request. As such, for ease of interpretation, I stratify the results according to gender, including the base and full model for both boys and girls.

¹ Results available upon request.

RESULTS

Parent's Education: Fathers and Mothers

First, I begin by highlighting the results from Model 1, the base regional fixed effects regression model for the full sample, here detailed in Table 2. In Model 1, which includes both father's education and mother's education, along with relevant controls, increases in parental education are negatively associated with children dropping out of school early. Controlling for other variables in the model, students with fathers who finished lower secondary school are 32% less likely to drop out of school early than students whose fathers had a primary school or lower education ($p < .001$). The size of this effect grows as the level of father's education increases, with students whose fathers have a college or higher education being 71% less likely to drop out of school early than those whose fathers had a primary or lower education ($p < .001$).

[Table 2 here]

Similar results exist for mother's education. Worth noting, however, is that mother's education has a significant effect at lower levels of mother's education. Students whose mothers started lower secondary school but did not finish are 30% less likely to drop out than students whose mothers have a primary or lower level of education ($p < .001$). Further, students whose mothers had a college or higher education are 79% less likely to drop out than students whose mothers have a primary or lower level of education ($p < .001$).

I will turn my attention briefly to discuss the role of the control variables in predicting children's educational persistence or early attrition from school. Gender does not significantly predict dropping out or remaining in school². Speaking or understanding an indigenous language is not statistically significant in the base model. Child's age significantly predicts the likelihood of dropping out, with a one-year increase in age increasing the odds of dropping out of school early by 21% ($p < .001$). Living with both biological parents appears to be a protective factor against dropping out, with the odds of dropping out

² Though gender is not significant across any of the models within the full sample, additional analyses (not shown here) indicate that the interaction between gender and mother's education is statistically significant ($p < .05$). As such, later results will show the same models stratified by gender. The interaction between gender and father's education is not statistically significant as a whole, but it is significant across several of the categories.

being 29% lower for students who live with both biological parents than those whose family situations differ from this ($p < .001$). Lastly, household size is associated with early attrition; controlling for other variables in the model, a one-person increase in household size increases the odds of dropping out by 4% ($p < .1$).

Financial Resources

Finally, household wealth is significantly and negatively associated with children's likelihood of dropping out of school early. In Model 2, an increase in household wealth is associated with a 30% lower likelihood of them dropping out of school ($p < .001$).

Even when controlling for measures of household wealth and economic status (Model 2), parental education continues to significantly predict whether students end school early. For example, children with fathers who finished lower secondary school are 18% less likely to drop out early than students whose fathers had a primary or lower education, controlling for other variables in the model ($p < .05$). The magnitude of this effect grows as the level of father's education increases.

Additionally, mother's education has similar and additive effects on predicting whether students will drop out of school early. Controlling for household wealth and other variables in the model (Model 3), students with mothers who started lower secondary school but did not finish are 24% less likely to drop out than students with mothers who have a primary or lower level of education ($p < .01$). Once more, the magnitude of this effect grows as the level of mother's education increases, with students whose mothers have a college or higher education being 66% less likely to drop out of school early than students whose mothers have a primary school or lower level of education ($p < .001$).

Family structure, household size, and child's age continue to be significantly associated with secondary school attrition. Speaking or understanding an indigenous language becomes statistically significant in the second model, with the level of significance decreasing in Model 3. Specifically, when controlling for wealth and other financial resources, adolescents who speak or understand an indigenous

language are 27% less likely to drop out of school than those who do not speak or understand an indigenous language ($p < .05$).

These results do not change significantly when education-related financial resources, specifically the receipt of *Oportunidades* and individual scholarships, are added to the model. Receipt of *Oportunidades* is itself significant. Students who received *Oportunidades* were 34% less likely to drop out than students whose families did not receive this conditional cash transfer ($p < .01$). Further, the receipt of individual scholarships is also significant, with students who received a scholarship being 53% less likely to drop out of school early than students who did not receive a scholarship ($p < .001$).

Boys vs. Girls

As noted above, in the models with the full sample, gender is not significantly associated with students leaving school early. However, additional analyses revealed that the interaction between gender and mother's education was significant, as well as several categories in the gender and father's education interaction³. Thus, I stratify the models described above by gender in Table 3, with results for boys in Models 4 and 5 ($n=6,284$) and results for girls in Models 6 and 7 ($n=6,698$). Separating the results into gender-specific models allows for greater ease of interpretation and highlights how the role of parents' education differs across gender lines. I include a base model (mother and father education plus all relevant controls) and the full model for both boys and girls. While the full results are in the table below, I will turn my attention to note any major changes that occurred when the models were run individually for girls and boys.

[Table 3 here]

Models 4 and 5 in Table 3 specifically focus on boys. Contrary to the results found for girls, mother's education appears to matter less at lower levels of the education spectrum. The comparison between starting lower secondary school and not finishing versus having a primary or lower education

³ Results available upon request.

level is not statistically significant across both models. Still, mother's education continues to matter overall for boys' overall educational persistence; this holds true even when wealth, government assistance, and scholarships are taken into consideration. These results are consistent with additional analyses that included an interaction between gender and mother's education that was statistically significant ($p < .01$) overall⁴, and significant or marginally significant across all categories except the "started secondary school but did not finish" category.

As noted in Table 3, the magnitude of the effect of mothers' education on girls' likelihood of dropping out is even more pronounced than with the full sample. For example, Model 6 indicates that girls whose mothers started secondary school but did not finish are 38% less likely to drop out than girls whose mothers had a primary or lower education ($p < .001$). Further, mother's education at lower levels is statistically significant for girls even though this is not true for boys. In Model 7, girls whose mothers started secondary school but did not finish were 34% less likely to drop out than those whose mothers had a primary school or lower education ($p < .01$). The comparison between starting secondary school and primary or lower education is not significant at all for boys. The rest of the results are similar to those in the full sample.

Earlier models (not shown here) included an interaction between gender and father's education. This interaction was not significant overall, except for one category. Consistent with the lack of statistical significance of the full interaction between gender and father's education, the results for father's education are nearly identical to those in the full sample. The only category that was significant in this interaction was the comparison between high school and primary or lower education, where girls with fathers who had a college or higher education were significantly less likely to drop out than those with a primary or lower education ($p < .01$).

Sensitivity Analyses and Robustness Checks

⁴ Results are not shown here.

To test for biased results, I ran additional models with variations of the sample, including: high school students only (dropped out or currently enrolled), non-high school students only (dropped out or currently enrolled), as well as other combinations. Each model yielded similar results and, for reasons noted above, I chose to include the full sample in my analyses.

Further, additional analyses examined the roles of mother's and father's education separately, using the same base model (Model 1) as the one noted above. Including both mother's and father's education in the analyses did not change the significance or magnitude of the results⁵. I also conducted tests to detect multi-collinearity – a concern if including both mother's and father's education – and did not find significant multi-collinearity, as the mean variation inflation factor (VIF) was substantially less than 10 (mean VIF=1.62) and no individual VIF was near the threshold of 10 (O'Brien 2007).

Lastly, to gauge the true effects of parental education, for each model I ran diagnostic tests to determine whether each category of education was statistically different from one another. Across most models, comparisons across category were statistically significant at $p < .05$ or greater significance⁶. Thus, the results shown above can be interpreted with greater confidence that these results are capturing actual difference.

Discussion and Conclusion

The primary purpose of this study was to examine the role of parental education, with a special focus on mothers, in predicting children's educational persistence – and how this varies across gender. While both parents' education levels matter for predicting children's educational persistence, the effect of mothers' education is felt even at lower levels of education. Thus, the results highlighted across all models in Table 2 provide empirical support for my second hypothesis that mother's education will have distinct and additive effects on children's educational persistence. Given that lower levels of education

⁵ Results available upon request.

⁶ Available upon request.

are not typically associated with higher incomes, this finding further underscores the distinct influence of mother's education on their children beyond simply providing monetary resources for the family.

Further, while educational opportunities have expanded to women in recent years, men have historically had greater access to schooling; thus, we might expect the effect of lower levels of education to disappear for fathers if there has historically been a standard level of education that most men achieve. An alternate explanation is that men are not as penalized as women in the job market for having lower levels of education. Thus, the financial resources that fathers can provide are not significantly different at lower levels of education than their counterparts with slightly more education. These factors work together to bear weight on children's persistence in schooling.

Even when controlling for economic resources, parental education continues to matter for children's educational outcomes. Economic resources themselves, however, are also statistically significant. These results are supported by well-established patterns in the literature that indicate socioeconomic divides in educational outcomes (Duncan and Murnane 2011), and they provide support for the first hypothesis proposed. However, most important is that parents' education matters for children's educational persistence *despite* controlling for household wealth. Thus, parents' education matters for children's education beyond the financial resources that it can provide for their children.

Differences across gender are also worth noting. If mother's education matters at all levels for girls while only at some levels for boys, there may indeed be gender-specific role modeling happening within households. Consistent with my third hypothesis, mother and father's education have distinct effects on children's educational persistence across the gender of the child (Table 3). The evidence shows that even when controlling for household wealth and other forms of income, there are still high correlations between parents' education and children's educational outcomes. While the individual influence of parents' education differs across the gender of the parent and child, each increase in the level of education attained by parents is negatively associated with early dropout. That is, increases to parents' education appear to be protective for children's likelihood of dropping out of school early.

The reasons for the observed trends are not completely self-explanatory, but I advance some ideas that may explain the phenomena. First, role modeling by parents may be particularly important for children's choices to continue, stall, or quit their schooling in a context where both internal and external migration are socially accepted, viable alternatives for achieving social mobility (Kattain and Szekely 2015). Further, previous research highlights the important role of early childhood experiences in determining future educational and life outcomes for children (Heckman 2006). Thus, the unobserved portion of the sample's childhood experiences may have some bearing on the results that emerge in this study.

Further, family-level characteristics matter for children's educational outcomes both directly and indirectly. Families are the primary non-school context that children encounter at early stages of their lives. Heads of households within families also determine the neighborhoods that children live in – and, consequently, the schools they have access to and later attend (Alexander et al. 2014). These family- and parent-level decisions are inherently influenced by financial resources and social and cultural capital. Thus, the results from this study may indeed be underestimating the influence of parents' education on children's educational outcomes. Mexico is a particularly important case for studying family-level influences because even despite wide-scale educational expansion, this expansion in educational opportunities has not led to higher rates of social class mobility (Pfeffer & Hertel 2014).

As with any empirical study, there are limitations to the current study. Given the cross-sectional nature of the data used for this analysis, it is not possible to track the results we see over the course of time. Additionally, given that this survey is made up of a sample of Mexican youth, the primary focus of the questions is on the youth themselves; thus, there is little detailed information about parents and their socioeconomic status beyond educational attainment. Information about migration status and history is also not included in this specific dataset. Because historically large migration streams to the United States have continued to provide alternative – and culturally accepted – pathways to economic mobility for low-income youth (Kattain and Szekely 2015), future research should test these same ideas and consider the role of migration. Higher secondary school dropout rates among males suggests that migration

opportunities may be particularly important for educational attainment among Mexican men (Kattain and Szekely 2015). In an analysis of migration on children's educational outcomes in Mexico, McKenzie and Rapoport (2010) find that migration to the United States accounts for decreases in schooling for boys. Thus, future research should consider the role of migration in children's educational attainment and persistence.

However, despite these limitations, the results detailed above provide a compelling case for including mothers' socioeconomic status when examining children's educational attainment and potential for upward social mobility. Furthermore, while the data used is cross-sectional, the recent nature of the data collection (taken in the summer of 2011) gives us a rich picture of present-day Mexico; the results from this study provide a rich foundation upon which future research can build.

While this study works to move the needle forward on better understanding the role of family-level socioeconomic status on educational attainment (and subsequent social mobility) by including both parent's education in the empirical analyses, future research should continue to examine the distinct influence of each parent on children's educational outcomes. Further, more studies need to take into consideration mother's education specifically. Given what we know about how mothers often are primarily responsible for caring for their children, we should expect that mothers have distinct effects on their children's outcomes. Where possible, scholars should include measures of both parents' socioeconomic status, rather than relying on the most highly-educated parent's (or, in many cases, father's) education. Moreover, future data collection projects should collect rich data for both men and women, rather than relying on current (and changing) societal trends to dictate the type of questions deemed appropriate for each gender. This will allow scholars to analyze not only the differential roles of mothers and fathers on their children but also how these factors influence intergenerational mobility over time.

The results of this study have important policy implications. Given the established importance of mothers' education in influencing their children, policymakers and stakeholders should lend special attention to increasing the educational attainment and access of girls around the globe. As these young

women will one day become mothers to the next generation, acquiring high levels of educational attainment will be especially important for future generations. Further, increased access to education allows women to be more civically engaged in their societies (Stromquist 2004).

Even when controlling for measures of household wealth and other forms of family income, the associations between mother's and father's education and children's educational persistence remains statistically significant. Further, mother's education has distinct and additive effects on predicting children's educational persistence – effects that cannot be fully captured by father's education and household wealth alone. Additionally, these results vary across the gender of the child. As noted, I find empirical support for each of the hypotheses I proposed.

Parents' education and social status clearly influence their children's educational outcomes. As educational persistence is a precursor for future educational opportunities that are connected to more favorable labor market outcomes, understanding this issue is of the utmost persistence. In the context of Mexico, a country that has developed and changed significantly in recent years, this is particularly important. Given the tremendous amount of time that children spend in non-school environments, family-level factors play a powerful role in shaping their lives. The current study seeks to address this gap in the research and provide suggestions for future research. As widespread societal changes influence changes in family structure and parental roles, continuing to examine the differential roles of mothers and fathers on their children will become increasingly important.

Table 1. Sample Descriptive Statistics

	Full Sample	Boys	Girls
	Frequency or Mean (Standard Deviation)	Frequency or Mean (Standard Deviation)	Frequency or Mean (Standard Deviation)
<i>Dependent Variable</i>			
Dropped out of school early	33.8%	32.6%	35.0%
<i>Independent Variables</i>			
Father's Education			
Primary or lower	34.2%	29.8%	38.0%
Started lower secondary, didn't finish	7.9%	8.2%	7.5%
Finished lower secondary	23.0%	24.9%	21.2%
High school (start or finish)	23.0%	24.0%	22.1%
College and higher	12.0%	13.1%	11.1%
Mother's Education			
Primary or lower	34.4%	30.6%	37.8%
Started lower secondary, didn't finish	7.7%	7.5%	7.9%
Finished lower secondary	26.0%	28.2%	24.1%
High school (start or finish)	22.6%	23.7%	21.7%
College and higher	9.2%	10.0%	8.5%
<i>Controls</i>			
Female	53.2%	--	--
Child's Age	18.3 (3.2)	18.2 (3.1)	18.5 (3.2)
Lives with Both Parents	79.3%	80.8%	78.0%
Household size	5 (1.8)	4.9 (1.8)	5.1 (1.9)
Understands/speaks indigenous language	5.0%	5.0%	5.1%
Household Wealth			
First Quintile	22.7%	21.3%	24.4%
Second Quintile	21.0%	19.5%	22.2%
Third Quintile	20.3%	20.3%	19.8%
Fourth Quintile	20.2%	21.6%	19.0%
Fifth Quintile	15.9%	17.3%	14.7%
Family Received Oportunidades	18.7%	17.9%	19.3%
Student Received Scholarship	20.1%	18.1%	22.0%

n=12,982

Note: All results are weighted using individual-level weights.

Table 2. Logistic Regression Predicting Dropping out of School Early Using Regional Fixed Effects

	Model 1 OR (SE)	Model 2 OR (SE)	Model 3 OR (SE)
Father's Education (vs. primary or lower)			
Started Secondary, didn't finish	0.93 (0.088)	0.99 (0.10)	0.94 (0.099)
Finished lower secondary	0.68*** (0.050)	0.82* (0.066)	0.77** (0.064)
High School (start or finish)	0.44*** (0.041)	0.60*** (0.055)	0.56*** (0.052)
College and higher	0.29*** (0.038)	0.47*** (0.065)	0.44*** (0.061)
Mother's Education (vs. primary or lower)			
Started Secondary, didn't finish	0.70*** (0.068)	0.79* (0.077)	0.76** (0.077)
Finished lower secondary	0.68*** (0.048)	0.83* (0.062)	0.80** (0.060)
High School (start or finish)	0.43*** (0.036)	0.61*** (0.054)	0.58*** (0.052)
College and higher	0.21*** (0.032)	0.35*** (0.054)	0.34*** (0.052)
<i>Controls</i>			
Female	0.96 (0.049)	0.92 (0.051)	0.93 (0.052)
Child's Age	1.21*** (0.011)	1.23*** (0.011)	1.22*** (0.011)
Lives with Both Biological Parents	0.71*** (0.051)	0.79** (0.058)	0.79** (0.059)
Household Size	1.04* (0.018)	1.03 (0.019)	1.04+ (0.019)
Speaks/understands indigenous language	0.95 (0.13)	0.64** (0.096)	0.73* (0.11)
Household Wealth		0.70*** (0.015)	0.69*** (0.015)
Family Received Oportunidades			0.76** (0.066)
Student Received Scholarship			0.47*** (0.038)
Observations	12,982	12,982	12,982

Robust SE eform in parentheses. Results are clustered by municipality.

*** p<0.001, ** p<0.01, * p<0.05, + p<0.1

Table 3. Logistic Regression Predicting Dropping out of School Early by Gender Using Regional Fixed Effects

	Boys		Girls	
	Model 4 OR (SE)	Model 5 OR (SE)	Model 6 OR (SE)	Model 7 OR (SE)
Father's Education (vs. primary or lower)				
Started Secondary, didn't finish	1.02 (0.14)	1.02 (0.15)	0.87 (0.10)	0.90 (0.12)
Finished lower secondary	0.77* (0.086)	0.86 (0.10)	0.62*** (0.064)	0.72** (0.079)
High School (start or finish)	0.51*** (0.067)	0.66** (0.093)	0.38*** (0.052)	0.49*** (0.066)
College and higher	0.31*** (0.058)	0.51*** (0.100)	0.28*** (0.050)	0.40*** (0.079)
Mother's Education (vs. primary or lower)				
Started Secondary, didn't finish	0.82 (0.11)	0.91 (0.13)	0.62*** (0.089)	0.66** (0.10)
Finished lower secondary	0.65*** (0.068)	0.76* (0.087)	0.73** (0.076)	0.84 (0.092)
High School (start or finish)	0.47*** (0.057)	0.65** (0.085)	0.40*** (0.051)	0.52*** (0.071)
College and higher	0.24*** (0.050)	0.39*** (0.080)	0.19*** (0.040)	0.29*** (0.068)
<i>Controls</i>				
Child's Age	1.21*** (0.017)	1.22*** (0.019)	1.21*** (0.013)	1.21*** (0.014)
Lives with Both Biological Parents	0.73*** (0.069)	0.79* (0.082)	0.69*** (0.065)	0.78* (0.077)
Household Size	1.02 (0.023)	1.03 (0.026)	1.06* (0.026)	1.05+ (0.027)
Speaks/understands indigenous language	0.89 (0.18)	0.66* (0.13)	1.00 (0.15)	0.80 (0.14)
Household Wealth		0.68*** (0.022)		0.69*** (0.019)
Family Received Oportunidades		0.82 (0.100)		0.71** (0.079)
Student Received Scholarship		0.44*** (0.053)		0.50*** (0.047)
Observations	6,284	6,284	6,698	6,698

Robust SE eform in parentheses. Results are clustered by municipality.

*** p<0.001, ** p<0.01, * p<0.05, + p<0.1

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