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Schooling choices and parental migration. Evidence from Mexico

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Abstract

This paper investigates the role of parental absence due to migration on education and labor market outcomes of children left behind in Mexico. I look at the effect of absence at different moments of a child's educational career and estimate the impact of the timing of a parent's migration in order to understand how mother's and father's inputs affect children's outcomes at different ages. Results show that a mother's migration when the child has to start a new level of schooling, i.e. when investment decisions on children's education must be made, has a significant negative impact on children's schooling. Also the duration of mother's absence plays a role: the longer the mother's migration, the less children are educated. I find that, when the mother migrates, daughters substitute the mother's work in or outside the household, depending on their age.

Keywords International migration · Education · Left behind · Intra-household allocations · Mexico

JEL classification F22 · J16 · I25 · D13

1 Introduction

Research in economics has extensively emphasized the critical role of the family in shaping children's cognitive and noncognitive abilities (McLanahan and Sandefur 2009; Heckman 2006, e.g.). Early family environment can influence children's outcomes, including educational patterns, especially during primary education, when

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parents take most of the decisions concerning investments in children's human capital. The worldwide increase in the number of children growing up in non-intact families raises new concerns on the impact of families' structure on investment in children's education.

In a context with low divorce and non-marital fertility rate, migration is among the most important determinants of family's dissolution, with children living separated from one parent, even in cases of an unbroken wife–husband relationship. Indeed, migration during the era of the *Great Emigration*[1] had been a significant factor contributing to the changes in the structure of Mexican families (Nobles 2013).

The effects of family's dissolution due to migration crucially depends on the gender of the migrant parent: gender is a significant determinant of many decisions on investments in children's wellbeing, including inputs into education acquisition. Studies on the determinants of children's education suggest that a mother's human capital is more closely related to children's educational attainment than the father's and that maternal childcare time significantly increases a child's schooling, especially if mothers are highly educated (Behrman et al. 1999; Datcher-Loury 1988). There is also evidence showing that income and assets managed by women have a higher impact on children's health and education compared to being managed by men (Duflo 2003; Thomas 1990, 1994). Moreover, women today are more likely to migrate alone becoming the principal wage earners to pursue better economic conditions. As a consequence, the number of children growing up with at least one parent living abroad is increasing, especially in developing countries (Le Goff 2016; UNICEF 2007). It calls for more research on the effect of adults' absence on children's educational attainment, with a specific focus on the gender of the absent parent.

This paper investigates the role of parents' absence due to migration on education and labor market outcomes of children left behind in Mexico. I focus on the effect on children in families where one of the parents migrates alone to the USA. The primary outcome of interest is the years of completed education; furthermore, I also look at the effect of parental absence on the probability of doing household work and of being employed outside the household.

The main contribution of the paper is to estimate the impact of parental migration based on the gender of the parent away from home. Moreover, I look at the effect of absence at different moments of a child's educational career, specifically when children and parents have to make decisions on schooling investment, and the parent's role and counseling are fundamental. It allows me to estimate the effect of the timing of a parent's migration and to understand how mother's and father's inputs affect children's outcomes at different ages.

I use data from the 1992 and 1997 cross-sections of the National Survey of Demographic Dynamics (ENADID) and focus on movements from Mexico to the USA. The ratio of women moving from Mexico to the USA has increased over time, even if women are still less likely than men to migrate to work in the USA. Cerrutti and Massey (2001) find that the determinants of female migration has changed through the generations, suggesting common labor force motivations for the international migration of both younger men and women.

[1] A period spanning from 1970 to 2005, during which Mexican migration to the USA increased steadily up to 10.5% in 2005 (Hanson and McIntosh 2010).

Any study aiming at estimating the causal effect of a change in the family's structure has to deal with the problem of selection. In this paper, I adopt a family fixed-effects strategy and compare siblings experiencing mother's or father's absence due to migration at different stages of their educational career. Siblings experience a parents' migration at the same point in time but at different schooling stages, yielding the opportunity to define treatment and control groups within the same family. Family fixed-effects strategy has been primarily used in economics to study the effect of family's shocks on children's outcomes, given its advantage to capture any omitted variable related to background characteristics shared by all siblings and to deal with unobserved heterogeneity between families. In this specific context, using a family fixed-effects model allows to get rid of the problem of selection into mother's or father's migration, since the estimation of the impact of migration comes from the comparison between siblings who experience the same type of migration at different ages.[2] The fixed-effects model also accounts for the time-invariant unobservable endowments shared by siblings from the same family. However, with family fixed-effects models, it is not possible to control for potential time-varying shocks affecting both parental migration and children's education. In an attempt to overcome this limitation, I run a robustness check by adding, among the control variables, an interaction term accounting for the presence of shocks at the municipal level, affecting children differently according to their ages. I also perform a placebo experiment by adding lags to the explanatory variables of interest. In both cases, results reassure the validity of the proposed identification strategy (see section "Robusteness checks").

Although the number and proportion of working children have decreased in recent years, in 2015, almost one-third of the Mexican youth who were supposed to attend the last level of compulsory education spent a large part of their time working at home or abroad. As from 1993, compulsory education in Mexico includes attendance of primary and secondary education, which means children are supposed to reach nine years of schooling.[3] However, INEE data report that during the 1990s, in Mexico, the attendance rate of children aged 6–11 (primary school) was 89.4%, and 78.6% for children aged 12–14 (secondary school). In the same period, the average years of completed schooling for the population aged 15 or older was shortly above six years (i.e., slightly more than completed primary education).[4] Even if the attendance of primary and secondary school is compulsory in Mexico, there is noncompliance with this obligation, and families have a certain degree of discretion in making decisions on children's basic education investment. It is in line with the idea that the parents' presence at the moment of establishing schooling choices matters for the children's future educational outcomes.

[2] It is reasonable to think that there are unobservable characteristics at family level that differentiate families where the mother migrates and where the father migrates. To the extent to which they are constant over time, such unobservables are absorbed by family fixed-effects and then do not represent a concern in this paper, which does not aim at understanding the different determinants of mother's and father's migration.

[3] In 2004 and 2012, respectively, pre-primary school and the upper-secondary school also became compulsory. However, these periods are out of the empirical analysis of this paper.

[4] The statistics reported in this paragraph come from the La Educación Obligatoria en México. Informe 2018, prepared by the INEE (Instituto Nacional para la Evaluación de la Educación).

This analysis contributes to the debate about the role of mothers and fathers on children's outcomes.[5] Children growing up in single-parent households (not only as a result of migration) suffer disadvantages, including poor school performance. However, it is still far from clear whether the mother's absence differs from the father's and how to disentangle the two effects. Moreover, I measure the impact of a mother's or father's migration on long-run children's outcomes. The data allow me to recover episodes of parents' migration happened at any time of their life, and I can estimate the effect on children's outcomes as measured at the time of the survey, i.e. (even many) years after the experience of a parent's migration. The paper also contributes to the vast literature studying the effect of parental migration on children's education by accurately estimating the impact of the timing of a parent's migration rather than the impact of migration per se. By exploiting variation in the time of migration within the same family, I overcome the problem of comparing migrant families with non-migrant families, and identify treated and control groups of children as those experiencing the same episode of migration but at different ages. It allows this study to contribute to the understanding of the effect of parental inputs and economic resources on children's outcomes at different development stages. Cunha and Heckman (2008) shows that the formation of (cognitive and noncognitive) skills may be differently affected by parental inputs at different stages of life. The departure of a parent from home might have an impact not only on early ages of a child but as well as later on in life, during adolescence, when cognitive skills might not be entirely determined yet. The findings of this analysis can have important policy implications. Knowledge of the stage in the child's educational career when the absence of a parent has a detrimental effect would allow policy-makers to design interventions that benefit individuals exposed to the most adverse conditions.

The remainder of the paper is structured as follows: section "Literature review" reviews the related literature; section "Data" presents data and descriptive statistics; section "Institutional setting and empirical strategy" describes the details of the institutional setting and the empirical strategy; in section "Results" results and robustness checks are discussed; section "Concluding remarks" concludes.

2 Literature review

Various disciplines have studied the relationship between family structure and children's outcomes, and many studies in economics have tried to understand the consequences of divorce or separation for children's schooling attainment. This strand of research has first focused on the USA; given the rising social concerns for children spending part of their childhood in a single-parent family, already back in the 1980s. USA studies suggest an adverse effect of living in a single-parent or divorced family on adults' educational attainment, with the effect depending on the length and the period of absence (Couch and Lillard 1997; Krein and Beller 1988). Economists have also emphasized the difficulty of disentangling correlation from causation since there can be unobservable factors at the family level that jointly affect the family structure and

[5] Haveman and Wolfe (1995) is a useful reference for a complete review of the methods and findings on children's attainment in the USA.

children's outcomes (Manski et al. 1992; Painter and Levine 2000). Numerous papers have used a sibling-difference approach to overcome this problem since this strategy solves the issue of endogeneity of background family characteristics. Studies in the UK and Sweden discovered that children experiencing family dissolution have a lower level of education. The negative effect persists even after controlling for the family economic conditions (Ermisch and Francesconi 2001; Jonsson and Gähler 1997).

Another strand of the literature has focused on the effect of parental death on children's outcomes by claiming that parental death can be considered a more exogenous event rather than divorce or separation. Findings reveal that losing a mother can have a more detrimental effect on college attendance than losing a father (Chen et al. 2009) and that the effect is the highest for individuals at the transition between primary and secondary school and between junior secondary and secondary (Gertler et al. 2004).

While parental migration is a different phenomenon compared to divorce or death of a parent, all three events have something in common: that children experience parental absence. Besides, migration can also entail a positive impact on the education of left-behind children due to remittances. Indeed, many economists have studied the attenuation of credit constraints and the positive income effects that remittances have on left-behind families. Edwards and Ureta (2003) find that remittances, an income source not directly correlated with parental schooling, have a significant impact on school retention in El Salvador. Bansak and Chezum (2009) show that remittances from abroad have a positive effect on school attendance for school-age children in Nepal. Yang (2008) exploits exchange rate shocks experienced by Filipinos working overseas, as a consequence of the 1997 Asian financial crisis, to show that schooling and educational expenditures increase when family members left behind receive more remittances.

Attempts to estimate the total effect of a household's member migration, i.e., the concurrent positive effect of remittance and the negative effect of absence, on children's education provide mixed evidence, with statistically significant estimates of both positive and negative sign (e.g., Hanson and Woodruff 2003; McKenzie and Rapoport 2011, for Mexico). Many papers rely on an IV approach to overcome the problem of the endogeneity of migration and use as an instrument either the historical migration rate or the labor market conditions in the country of destination.

While most of the papers look at the effect of a household member's migration, few studies focus on the impact of mother or father's absence due to migration. Among them, Antman (2011) studies the short-run effect of paternal migration to the USA on outcomes of children living in Mexico and finds a negative short-term effect on hours devoted to studying in the period following paternal migration and an increase in working hours of boys aged 12–15 years. Cortes (2015) explores the effect of a mother's migration on children's wellbeing in the Philippines and estimates a significant positive effect of a mother's migration on the probability that a child is lagging in school. Both papers rely on an instrumental variable approach to account for the endogeneity of migration decision, while a different empirical strategy is adopted in Antman (2012), who uses a family fixed-effect strategy and compares Mexican siblings experiencing father's migration to the USA at different ages. She estimates a positive effect of a father's migration on his daughters' completed schooling. The empirical strategy in this paper is inspired by the previous one. However, the central hypothesis on which it relies is different. In Antman (2012), the underlying assumption is that education of children suffering migration after turning

20 years old is not affected by a father's being in the USA, since, at this age, individuals are very likely to be already out of school enrollment. In such a framework, by construction, only later-born siblings are affected by a father's migration, potentially adding a bias to the results. In contrast, the identification strategy used in this paper does not generate any systematic relations between a parent's migration and the birth order of the children, because it exploits migration episodes at different moments of each child's educational career. It ensures that migration at any stage is distributed quite uniformly over birth orders, as discussed later (see section "Identification issues"). Moreover, Antman (2012) is interested in the effect of the father's migration. Instead, the focus here is to detect the effect of migration, depending on the gender of the migrant spouse. Another crucial difference concerns the choice of the data. ENADID sample is representative of the Mexican population as a whole and collects quite detailed information on the migration history of all household members, including children. The MMP (Mexican Migration Project), used in Antman (2012), collects data on communities that are not randomly selected. Such data, although give a proper representation of Mexican migrants to the USA, are not representative of the population and do not collect information on children's migration history. Such information is crucial since parental choices on an offspring's education and migration can be simultaneous. Assuming a negative (positive) correlation with education acquired in Mexico and migration to the USA, it is reasonable to expect that parents give less (more) education to children with the prospect of future migration. The exclusion of migrant children from the estimation sample would contribute to a clearer identification of the effect at interest.

3 Data

The data used in this paper come from the 1992 and 1997 cross-sections of the National Survey of Demographic Dynamics (ENADID, Encuesta Nacional de la Dinámica Demográfica) conducted by Mexico's National Statistical Agency (INEGI). The ENADID is a large survey, representative of the Mexican population, that collects personal information on household characteristics, including detailed information on individual migration, on the country of destination and on time spent away.[6]

3.1 Variables and sample definition

I use the years of completed education as the main outcome variable, including years spent attending vocational courses.[7] It is a well-recognized measure of

[6] ENADID is available also in 2006, 2009, 2014, and 2018. However, these are very different years compared to the 1990s in terms of both migration rate and family size, as well as aggregated economic conditions. Moreover, due to changes in the structure of the questionnaires, 1992 and 1997 are also the waves more directly comparable.

[7] Vocational education and training provide a combination of theory and company-based training to prepare individuals with skills to participate productively in the labor market. Author's computation on ENADID data reveals that vocational courses are very important, especially for girls: controlling for girls' age, attendance of such courses results in a higher probability of working out of the household and in a smaller probability of doing household works.

investment in human capital, more informative than alternatives, such as school attendance. I also run some regressions to look at the impact of parents' migration on the probability of doing household work and the likelihood of being employed.

Years of completed education might be a censored measure for those children still attending school, and not taking it into account can result in biased estimates. This problem is addressed in two ways. First, the analysis focuses on children older than 16 years, because at this age, they are not expected to be enrolled in school. Indeed, this is a sample for which censoring is not a major problem (a robustness check is performed by using only children older than 19 years, see section "Robusteness checks"). Second, an age and gender-specific school index is built and used as an outcome variable. The index is defined as the difference between the years of schooling of the individual i of gender g of cohort c, S_{igc}, and the average years of schooling of his/her age and gender cohort, $\overline{S}_{gc}$. By using this approach, individual schooling attainments are rescaled relative to the performance of students of the same gender and cohort. This outcome variable has the advantage of using all individuals in school age, i.e., all children aged 6 or older, then to increase the sample size.

To identify parental migration episodes, I use all the available sources in ENADID: household members are asked if they have ever worked in the USA. Respondents are also asked to provide information on their prior residence; another source of information is the section in which respondents report episodes of migration up to five years before the survey. Importantly, this information is also recovered for individuals not living at home at the moment of the survey, but still considered as household members. I only focus on migration experiences from Mexico to the USA.

The estimation sample includes daughters and sons of the head of the household. It ensures that parents, and no one else, are making decisions on their schooling. The main estimation sample includes all children aged 16 or older; when the outcome variable is the index of schooling, the estimation sample includes all children in school age, i.e., 6 years old and older children. The focus is on families in which either the father or the mother experienced any migration to the USA. The family fixed-effects strategy also requires to use only families in which there are at least two kids and to omit families with only one child at schooling age. One major consequence of this strategy is that the results of this study cannot be generalized to one-child families, but they are valid only for families with two or more children.[8] Children who have migrated at least once to the USA are excluded from the sample: the expectation of their future migration can bias investment in one child's education.

[8] It does not represent a major problem in the context of this study. The sample is made by children of mothers who took their fertility decisions across the 1970s and 1980s, when total births per woman were about seven and four, respectively (source: https://data.worldbank.org/indicator/SP.DYN.TFRT.IN?locations=MX). In ENADID 1992 and 1997 data, the share of the single-child family is about 15% in the sample of school-age children, i.e., aged 6 or more, with at least a migrant parent. *T*-tests comparing migrant mother (father) households with single and multiple children show that families with a single child are significantly different from families with more children, in terms of parents' characteristics. This result reduces the external validity of this study only to multiple children's household.

Table 1 Summary statistics

	Mean	Standard deviation	Observations
Panel A—sample including 16 years old and older children			
Years of schooling	8.554	3.4	7494
Working outside the household	0.628	0.483	7494
Doing household work	0.177	0.382	7494
Attendance rate	0.227	0.419	7494
Mother migration to the USA	0.063	0.244	7494
Father migration to the USA	0.937	0.244	7494
Male	0.489	0.5	7494
Age	20.91	5.58	7494
Birth order	2.871	2.001	7494
Panel B—sample including 6 years old and older children			
Attendance rate	0.653	0.476	21,638
Mother migration to the USA	0.056	0.229	21,638
Father migration to the USA	0.944	0.229	21,638
Male	0.504	0.5	21,638
Age	14.174	6.316	21,638
Birth order	3.291	2.305	21,638

Means and standard deviations of main characteristics of children included in two different samples: Panel A, all children aged 16 or older; Panel B all children aged 6 or older, living in households where either the mother or the father migrated to the USA and with at least two children

Table 1 reports summary statistics for the two samples used in the analysis: in Panel A, there are means and standard deviations for all children aged 16 or older, while in Panel B, the same statistics are reported for all children aged 6 or more. In both cases, the samples only include children of families in which either the father or the mother migrates to the USA and with a minimum of two kids. Individuals in Panel A have on average about 8.5 years of schooling; about 94% of kids experienced father's migration while the remaining 6% experienced mother's migration; the average individual is aged 21 and is the third born in the family; the share of males and females in the sample is quite balanced. Summary statistics for the sample in Panel B are quite similar to those in Panel A, except for age and birth order. This implies that when all children of schooling age are included, the average individual is younger, and also higher birth parities are included in the analysis.

In Table 2 households with migrant mothers are compared with households with migrant fathers. As expected, the two types of families differ significantly in some dimensions. Migrant fathers are less educated than non-migrant fathers, while migrant mothers are older and more educated than non-migrant mothers. Additionally, families in which the father migrates are bigger than families in which the mother migrates. The share of males in the two types of families is not significantly different. The differences between families in which the mother migrates and families in which the father migrates suggest that the process of selection into migration works differently for migrant mothers and fathers. It might be that such differences also drive differences in the estimated impact or rather that the two types of families

Table 2 Tests on household characteristics

Migrant father vs migrant mother			
	Mean migrant father	Mean migrant mother	*p* values
Father's age	44.435	43.160	0.075
Father's years of schooling	4.851	7.722	0.000
Mother's age	37.657	38.950	0.001
Mother's year of schooling	5.064	6.326	0.000
Family size	5.112	4.234	0.000
Share of male children	0.502	0.472	0.082

The characteristics of the households in which the mother migrates are compared with the characteristics of the households in which the father migrates; the *p* values in the last column derive from a *t*-test on the equality of the mean between the two groups

react differently to one parent's migration (e.g., mothers care for children when the father migrates, while when the mother migrates other relatives take care of the children), thus having heterogeneous results in families with migrant mother and father.

4 Institutional setting and empirical strategy

Any study aiming at estimating the causal effect of migration has to deal with the problem of selection. In this specific context, selection may arise if, for example, parents who care more about children's education are also more likely to migrate. Thus, the comparison between migrant and non-migrant families would lead to an overestimation of the effect of migration on education. Moreover, since this paper aims to estimate the effect of the migration of both mothers and fathers, it is necessary to also account for the fact that households in which the mother migrates can systematically differ from those in which the father migrates. A comparison between families experiencing the two types of migration would produce biased estimates.

To get rid of the problem of selection into (father's and mother's) migration, I adopt a family fixed-effects strategy and compare siblings experiencing the same type of migration at different moments of their educational career.

4.1 Institutional setting

Basic education in Mexico is divided into three steps: primary, lower-secondary, and upper-secondary school.[9] Children enter primary school at the age of 6 and attend grades one to six until age 12. Then, they enter lower-secondary schools for three years, grade seven to nine, and upper-secondary school for another three years, from grades ten to twelve (see Fig. 1 for a sketch of the Mexican education system).

Since 1992, education in Mexico is compulsory until the completion of lower-secondary school (grade nine). UNESCO data reveal, however, that the average years

[9] The names in Spanish are: *primaria*, *secundaria* and *preparatoria*, respectively.

of completed schooling for adults aged 25 or more was about 5.99 years in 1990 and 6.72 years in 2000: a vast majority of Mexicans do not go beyond primary education.[10] Furthermore, the percentage of out-of-school children at primary school age was about 4.27% in 1997, while children of lower-secondary school age who were out of school were about 25.9% in 1999. Even if schooling is compulsory and free until grade nine, there is a significant share of children not attending primary education and an even greater share staying out of secondary school. It is important to understand why it happens and how policy-makers can intervene to increase schooling attendance and compliance with the schooling obligation.

Table 3 reports other statistics on education in Mexico for the school years 2000–2001 and 2001–2002, computed at national level.[11] The drop-out rate indicates the percentage of pupils who abandon school before completing the specific educational level: only 2% of pupils abandons primary school before completion; while about 7 and 8% of pupils abandon lower-secondary school before completion; as for upper-secondary school, the drop out rate increases to more than 15%. The second index, the rate of completion, is defined as the percentage of pupils who manage to complete each educational level during the *n* years devoted to that specified level, that is, with no delay or repetition. This value is high for both primary and lower-secondary schools (close to 90% and 80%, respectively) and a bit lower for upper-secondary school (about 60%).[12] These statistics suggest that once children start primary and lower-secondary education, they are very likely to complete the entire level of schooling and to do it on time. Still, low compliance with compulsory schooling is observed. Possibly, decisions of enrollment made at the beginning of each new level of school are the critical choices preventing children from attending compulsory education: it is then crucial to understand what factors are affecting this choice.

4.2 Empirical strategy

The empirical model captures the moments of the choice with two dummies taking value one if (i) the child experiences parental absence when he/she is 6–7 years old (corresponding to the moment in which decisions on entering primary education must be taken) or (ii) the child experiences parental absence when he/she is 12–13 years old (when decisions on entering secondary school must be considered).

I estimate the following equation:

$$Years\_of\_Schooling_{if} = \alpha + \sum_{p=mother,father}(\beta_{1,p} * Mig - Primary_{if,p} + \beta_{2,p} * Mig - Secondary_{if,p}) + \beta_3 X_{if} + u_f + v_{if} \quad (1)$$

where the dependent variable is the years of completed schooling, as measured at the time of the survey, of child *i* in family *f*. I also run some regressions by using as outcome variables the probability of doing household work and the probability of

[10] Data Source: http://data.uis.unesco.org/Index.aspx?queryid.

[11] I cannot use the information on schooling years before 2000/2001 because they are not available.

[12] The rate of completion gives indirect information on repeaters: the high share of pupils completing primary and lower-secondary school on time suggests that repeaters are few at these two school levels.

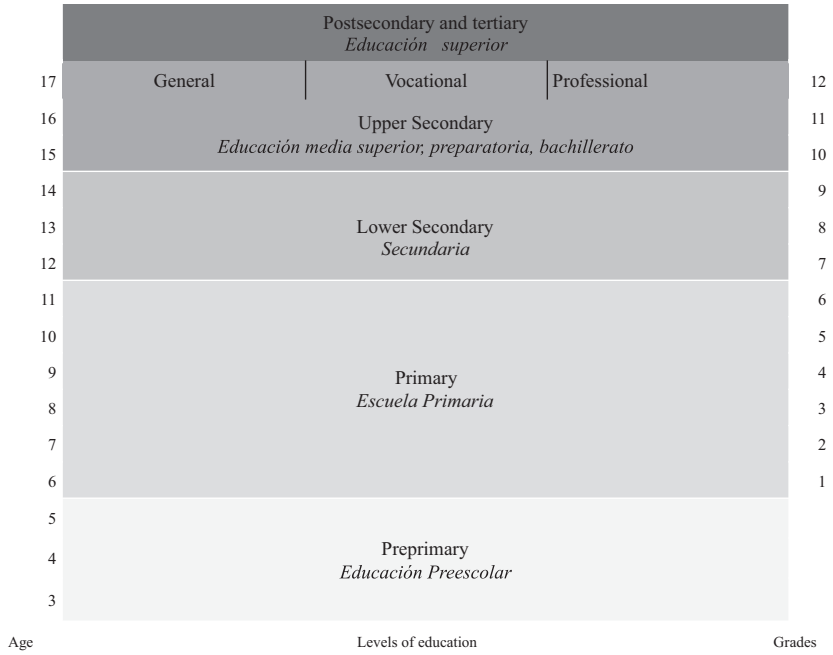

Fig. 1 Mexican educational system. Author's reproduction from National Center for Educational Statistics

working, both measured at the time of the survey. *Mig-Primary* is a dummy variable and takes value one if the mother (father) was absent when the child was 6–7 years old and *Mig-Secondary* is equal to one whether the child was experiencing one parent's absence when he/she was 12–13 years old.[13] The list of controls includes age, age squared, year of birth dummies, gender of each child, birth order dummies and a dummy for school attendance at the time of the survey.[14] I also add a control for children affected by the 1992 school reform. The family fixed-effects, u_f, capture all time-invariant characteristics common within a family; v_{if} is the idiosyncratic component. The coefficients of interest are $\beta_{1,p}$ and $\beta_{2,p}$, which are computed for father's and mother's migration.

Using a family fixed-effects strategy allows me to get rid of the problem of selection into the mother's or father's migration, since the estimation of the impact of migration comes from the comparison between siblings who experience the same

[13] The two-year age bins choice is justified by the fact that in 1992 and 1997 ENADID data, among children attending the first grade of primary school, about 85% are 6 or 7 years old, while, among children attending the first grade of secondary school, ~75% are in the age range 12–13. The reason for not further expanding the treated age range is that the average birth spacing among children is about 2.7 years. An age bin larger than two years would assign the treatment to more than one sibling in the family, potentially reducing within family variability.

[14] Attendance can be seen as a bad control in this regression, according to the definition provided by Angrist and Pischke (2014): it has been measured after parent's migration, and it could have been affected by the migration itself. However, it is reassuring that the effect of parental migration in the unconditional estimations remains significant and similar in magnitude than in the conditional estimates (see Table 5) and that the main results remain unchanged if this control is excluded.

Table 3 Mexican schooling indicators

	Drop-out rate		Rate of completion	
Schooling year	2000/2001	2001/2002	2000/2001	2001/2002
Primary school	2%	2%	86%	88%
Lower-secondary school	8%	7%	75%	78%
Upper-secondary school	17%	16%	59%	59%

Source: Instituto Nacional de Estadistica y Geografia (INEGI)

type of migration at different ages. The fixed-effects model also accounts for the time-invariant unobservable endowments shared by siblings from the same family. The counterfactual child in this analysis is the child experiencing parental migration at ages different from 6–7 and 12–13 rather than the child who never experienced episodes of parents' migration. While these estimates accurately measure the impact of the timing of migration on children's education (rather than the effect of migration per se), they say nothing about the difference with children who have never experienced parental migration, who can still be worse off than they would have been if their mother or father had migrated.

4.2.1 Identification issues

A potential threat to this approach is the endogeneity of the timing of parental migration compared to the child's education. In other words, parents might decide to migrate at the beginning of a child's school level on purpose since the child can compensate for a parent's absence staying out of school. A similar problem of reverse causality emerges if parents migrate at the beginning of a child's school level to repay for his/her education. Table 4 shows the *t*-tests associated with the difference in the probability of parental migration at the ages of the choice versus other ages within the same school level. In Panel A.1, I report the *t*-test for the mother's absence in primary school while, in Panel A.2, the same test is performed for the mother's absence in secondary school. In both cases, the difference is minimal and never statistically significant, suggesting that, conditionally on having a migrant mother, it is equally probable that she is absent at the moment of the choices and at other ages. Panel B.1 and B.2 report the same test for the father's absence. While there is no statistically significant difference in the probability of the father's absence at different ages in secondary school, there is evidence of a significant difference in primary school. The negative sign suggests that fathers are more likely to be absent at other ages than at the periods of choices in primary school. One possible reason is that the father may have multiple episodes of migration compared to mothers; then, I may be able to register father's absence when the child is 8–9 (or 10–11) years old but not when the child is 6–7 years old. Results on the father's migration must be interpreted with caution.

As a further robustness, I also run the placebo regressions to validate the timing of the children's choice of schooling. The exercise involves two dummies for parents' migration turning to one when the child is already in a specific school level (i.e., the

Table 4 *T*-tests on the probability of parents' migration at ages of the choice versus other ages

	Difference	*p* value
Panel A.1—mother's absence at primary school		
Difference between probability of mother's absence when the child is 6–7 and		
Mother's absence when the child is 8–9	0.000	1.000
Mother's absence when the child is 10–11	0.005	0.653
Panel A.2—mother's absence at secondary school		
Difference between probability of mother's absence when the child is 12–13 and		
Mother's absence when the child is 14–15	0.013	0.124
Panel B.1—father's absence at primary school		
Difference between probability of father's absence when the child is 6–7 and		
Father's absence when the child is 8–9	−0.006	0.028
Father's absence when the child is 10–11	−0.009	0.005
Panel B.2—father's absence at secondary school		
Difference between probability of father's absence when the child is 12–13 and		
Father's absence when the child is 14–15	−0.000	0.860

The table reports the difference between the probability of mother's absence at child's ages of the choice of primary and secondary school and mother's absence at other ages within the same school level l (Panel A.1 and A.2, respectively). In the last column, *p* values associated with a *t*-test on the mean difference are reported. Panel B.1 and B.2 report the same statistics for father's absence

dummy for migration when taking the decision on primary school turns to one when the child is 8–9 years old and the dummy for secondary school when the child is 14–15). This is similar to adding lags to the explanatory variable of interest. Results are reported in section "Robusteness checks" below.

A common concern when using a family fixed-effects model is that it does not account for time-varying shocks that could affect both parental migration and children's education. I perform a robustness check in which I add to the control variables an interaction between the municipalities' fixed-effects and a three-year indicator for a child's birth. Such interactions allow controlling for the presence of shocks at the municipality level that hit children differently according to their ages and, at the same time, affect parental migration. It is reassuring that the principal results remain unchanged.

Another pitfall of the empirical strategy is the sample selection due to using only families with at least two children. I study children at schooling age in Mexico during the 1990s, where the fertility decisions of their mothers were made across the 1970s and 1980s. According to the World Bank Data, the total fertility rate was about 6 children per woman in the 70s and 4 children per woman in the 1980s.[15] In the 1992 and 1997 ENADID sample, among women with at least one child at school age (six years or more), those with a single child represent less than the 10%.

A further possible threat to the identification strategy comes from the eventual correlation between a mother's and father's migration and their decision on fertility: mothers, for instance, may decide to migrate only after the births of all children, while fathers may be more likely to migrate in between the births. This discrepancy

[15] Data source: https://data.worldbank.org/indicator/SP.DYN.TFRT.IN?locations=MX.

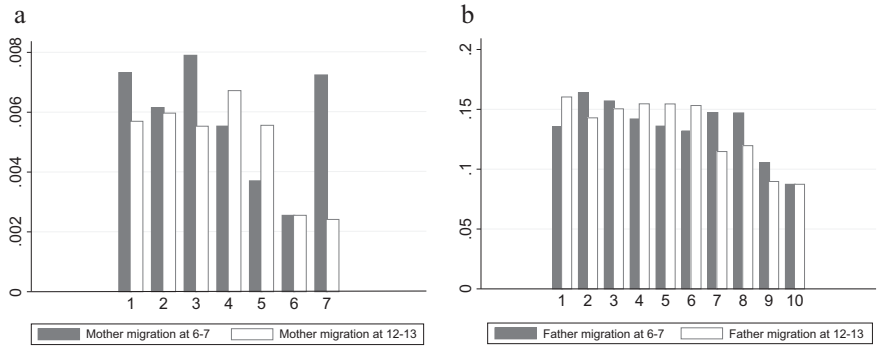

Fig. 2 Birth Order and migration. **a** For each birth order, on the *x*-axis, the percentage of children experiencing mother's migration at the ages corresponding to school choice is plotted. **b** For each birth order, on the *x*-axis, the percentage of children experiencing father's migration at the ages corresponding to school choice is plotted. Author's computation on the ENADID sample made on children of migrant mothers or fathers aged 6 or more

might generate correlations between the timing of mothers' and fathers' migration and their fertility decisions. If this were true for any household size, only firstborns would have suffered a mother's migration later in their educational career. If a correlation between the timing and spacing of births and migration exists, a correlation between birth order and children's age at the time of parental migration must also exist. Descriptive evidence is provided to show that it is not the case. Figure 2a, b shows the probability of experiencing a mother's (father's) migration at each critical threshold, that is when the child is aged 6–7 or 12–13 years. A father's migration at any stage is distributed more uniformly over birth orders compared to a mother's migration. However, a mother's and father's time of migration do not show a systematically different pattern compared to the birth order of the children. Then, even if there are small differences in the timing of migration by the gender of the migrant, they do not represent a threat to the validity of the proposed identification strategy.

5 Results

This section reports the results of the estimation of Eq. (1). The sample for the estimation includes all children who are 16 years and older. The dependent variable is years of completed school, and the controls are defined in section "Empirical strategy". Standard errors are clustered at the family level.

The results unambiguously suggest that children's schooling is affected by the timing of parental absence due to migration to the USA. Interestingly, the impact differs according to the age of the child during a parent's absence and it also varies based on the gender of the migrant spouse and the gender of the child.

Table 5 reveals that suffering maternal absence when secondary school should start, namely at 12–13 years old, results in having about 2 years of school less than the siblings enjoying the presence of their mother at the same age. In column (1), I report results with no controls; in column (2), I only add a control for the gender of

the child interacted with dummies for parental migration; column (3) and (4) report results, including all the controls. The detrimental effect of maternal migration in the unconditional model holds once I include individual level controls. Moreover, the interaction of parent's migration with the gender of the child in columns (2) and (4) reveals that the mother's absence is detrimental at any stage for girls, with statistically significant and negative results also for maternal absence at the beginning of primary school. Boys are, instead, negatively affected only by maternal absence at the beginning of secondary education; the coefficient for boys is higher than the coefficient for girls. However, such difference is not statistically significant. Girls experiencing mother's migration at the beginning of secondary school have about 1.5 years of schooling less than the daughters enjoying the presence of their mother at that age. Looking at the average value of years of schooling, reported at the bottom of the table, it suggests that treated girls stop attending at about six years of education, i.e., after primary school. It is in line with the assumption that they do not even start to attend secondary school if the mother is away when the enrollment decision must be made.

The presence of parents at home, when the decision on entering a new level of schooling must be chosen, can be seen as the extensive margin effect. By exploiting information on the duration of parental absence, it is possible to shed light on the effect of one more year of a parent's absence on children's schooling, i.e., the intensive margin effect. I expect a longer parent's absence to be associated with a lack of parental inputs and values concerning important life choices, including education. Duration is measured here as the years of a parent's absence before the child turns, respectively, 6 and 12 years old. Table 6 displays the results of the duration of parental absence on the years of schooling. They show that daughters are negatively affected by the duration of maternal absence at the beginning of both primary and secondary school, while sons are negatively affected only at the beginning of secondary school. Coefficients in column (2) reveal that one more year of mother's absence before the daughter starts primary education reduces schooling by 0.7 years on average, and by 0.6 years when accounting for the years of maternal absence before starting secondary education. The detrimental effect of a longer maternal absence can be linked to the lack of parental inputs and values concerning important life choices, among which education, and the absence of positive role models, played especially by the most-educated parent.

Following, I report results on the impact of parents' absence on two different outcomes: the probability of doing household work and the probability of being employed outside the household. Table 7 shows that the mother's absence at 6–7 increases children's probability of doing household work. This last outcome is measured at the time of the survey, and the estimation sample is made on children aged 16 or more. It means that the estimated effect is not simultaneous with the episode of mother's migration, but it is measured at least ten years later. The persistence of this effect suggests that children experiencing mother's migration when they are too young to work outside the household, start to 'substitute' the mother in household work and keep this habit also later on in life.

Another result of Table 7 is that the mother's migration at the beginning of secondary school has a negative effect on the probability of daughters doing household work. If a daughter is experiencing maternal absence at 12–13 who is not

Table 5 The effect of parental migration on children's years of schooling

	(1)	(2)	(3)	(4)
Mother's absence				
Beginning of primary	−0.710	−2.443**	−0.422	−2.050**
	(0.654)	(1.018)	(0.608)	(0.991)
Beginning of secondary	−2.147***	−1.744**	−1.847***	−1.488**
	(0.705)	(0.694)	(0.670)	(0.676)
Beginning of primary*male		2.672**		2.344*
		(1.228)		(1.198)
Beginning of secondary*male		−1.089		−0.957
		(1.217)		(1.198)
Father's absence				
Beginning of primary	−0.044	0.136	0.078	0.218
	(0.168)	(0.206)	(0.164)	(0.198)
Beginning of secondary	−0.140	−0.263	−0.063	−0.137
	(0.163)	(0.198)	(0.155)	(0.186)
Beginning of primary*male		−0.341		−0.269
		(0.258)		(0.245)
Beginning of secondary*male		0.234		0.161
		(0.257)		(0.244)
Male		−0.232***	−0.256***	−0.244***
		(0.088)	(0.079)	(0.085)
Age			0.590***	0.589***
			(0.165)	(0.165)
Age squared			−0.012***	−0.012***
			(0.003)	(0.003)
Birth order 2			−0.299***	−0.295**
			(0.115)	(0.115)
Birth order 3			−0.420**	−0.417**
			(0.179)	(0.180)
Birth order 4			−0.198	−0.193
			(0.247)	(0.248)
Birth order 5			−0.291	−0.282
			(0.311)	(0.312)
Birth order 6			−0.365	−0.355
			(0.384)	(0.385)
Birth order 7			−0.335	−0.339
			(0.452)	(0.453)
Birth order 8			0.106	0.110
			(0.574)	(0.575)
Birth order 9			0.193	0.196
			(0.644)	(0.647)
Birth order 10+			0.685	0.689
			(0.723)	(0.723)

Table 5 continued

	(1)	(2)	(3)	(4)
Attendance			0.832***	0.829***
			(0.119)	(0.120)
Reform			1.960**	1.949**
			(0.952)	(0.953)
Average schooling	8.286	8.286	8.286	8.286
verage attendance rate	0.227	0.227	0.227	0.227
List of controls	No	No	Yes	Yes
Family fixed effect	Yes	Yes	Yes	Yes
Year of birth dummies	No	No	Yes	Yes
Observations	7494	7494	7494	7494

Only children aged 16 or older. Dependent variable: years of completed schooling including the attendance of vocational courses. In column (2) and (4) the coefficients for mother's and father's absence are interacted with a dummy for males. Standard errors clustered at the family level are in parentheses. Significance at the 10% level is represented by *, at the 5% level by **, and at the 1% level by ***

doing household work and is also less educated than her sisters, what is she really doing? Results in Table 8 seem to suggest that they are working outside the household. Again, this last result can be interpreted as a mother-daughter substitution: girls experiencing maternal migration at 12–13 are more likely to start working outside the household, possibly in order to help the family repay the cost of the migration. Another interesting result of Table 8 is a significant and negative impact of the mother's migration at the beginning of primary school on the probability of being employed. Children experiencing maternal absence at young ages are less likely to go and work, but more likely to do household work.

5.1 Robusteness checks

In the first robustness, I study the effect of parental absence and its duration on an alternative measure of years of schooling, i.e., an index defined as the difference between the years of schooling of the individual i of gender g of cohort c, S_{igc}, and the average years of schooling of his/her age and gender cohort, $\overline{S}_{gc}$. Individual schooling attainments are rescaled relative to the performance of students of the same gender and cohort. This dependent variable allows me to include in the sample all children in schooling age and to reduce the sample cut due to the selection of children who are at least 16 years old. Regression results are based on a sample of more than 20,000 children.

Results (see external document in the online Appendix) reveals that the sibling experiencing mother's migration at the beginning of secondary school has about half a year of schooling less than his/her cohort with respect to his/her siblings enjoying the presence of the mother at home at the same age. When parents' migration interacts with the gender of the child, the coefficients are not very precisely estimated

Table 6 The effect of the duration of parental migration on children's years of schooling

	(1)	(2)
Duration of mother's absence before		
Beginning of primary	0.086	−0.753***
	(0.205)	(0.280)
Beginning of secondary	−0.608*	−0.630**
	(0.352)	(0.277)
Beginning of primary*male		0.885***
		(0.221)
Beginning of secondary*male		−0.083
		(0.308)
Duration of father's absence before		
Beginning of primary	0.015	0.077
	(0.052)	(0.070)
Beginning of secondary	0.055	0.001
	(0.060)	(0.073)
Beginning of primary*male		−0.109
		(0.075)
Beginning of secondary*male		0.100
		(0.092)
Male	−0.251***	−0.246***
	(0.079)	(0.082)
Age	0.597***	0.594***
	(0.165)	(0.166)
Age squared	−0.012***	−0.012***
	(0.003)	(0.003)
Birth order 2	−0.292**	−0.285**
	(0.114)	(0.115)
Birth order 3	−0.411**	−0.404**
	(0.179)	(0.179)
Birth order 4	−0.177	−0.175
	(0.247)	(0.247)
Birth order 5	−0.281	−0.272
	(0.311)	(0.312)
Birth order 6	−0.340	−0.324
	(0.384)	(0.385)
Birth order 7	−0.296	−0.296
	(0.451)	(0.452)
Birth order 8	0.151	0.161
	(0.572)	(0.573)
Birth order 9	0.240	0.247
	(0.643)	(0.645)
Birth order 10+	0.735	0.739
	(0.721)	(0.722)

Table 6 continued

	(1)	(2)
Attendance	0.835***	0.834***
	(0.119)	(0.120)
Reform	1.947**	1.946**
	(0.953)	(0.953)
Average schooling	8.286	8.286
Average attendance rate	0.227	0.227
Family fixed effect	Yes	Yes
Year of birth dummies	Yes	Yes
Observations	7494	7494

Only children aged 16 or older. Dependent variable: years of completed schooling including the attendance of vocational courses. In column (2) the coefficients for the duration of mother's and father's absence are interacted with a dummy for males. Standard errors clustered at the family level are in parentheses. Significance at the 10% level is represented by *, at the 5% level by **, and at the 1% level by ***

and never statistically significant at 5% or lower significance level. In addition, a longer duration of the mother's absence when the decision of entering secondary education must be taken is significantly detrimental for girls (see column (2) of Table external document in the online Appendix).

The identification relies on the main assumption that only parental absence at the beginning of a new level of schooling has an impact on children's years of education. Statistics reported in Table 3 on the drop-out and completion rates suggest that a child entering primary or secondary education in Mexico is very likely to attend each level of school entirely. To defend the validity of this assumption, I also run a placebo test, by defining the treated group with lags, i.e. the dummies for mother and father's absence at the beginning of primary and secondary school turn to one when the child is already in primary and secondary school, at 8–9 and 14–15 years respectively. The definition of these dummies is conditional on parents not being absent when the decision on entering primary and secondary education must be made. Table external document of the online Appendix reports placebo estimates run on the sample of children who are at least 16 years-old (column (1) and on the sample of all children in schooling age with the index of schooling as the outcome variable (column (2). The family fixed-effects estimation results in never statistically significant effects.

As a further check of the results, I run a regression on the sample of children who are 16 years and older by adding to the list of controls an interaction term between municipality fixed-effects and a three-year indicator. The interaction term accounts for events occurring at the municipal level and affecting children differently depending on their ages, as, for example, the construction of new schooling or other factors that could have influenced the mother's or father's migration at a specific time. Results are reported in Table external document of the online Appendix and confirm the negative effects of the mother's absence at the beginning of secondary school, although standard errors are big because the specification is very demanding.

Table 7 The effect of parental migration on household work and employment

Dependent variable	(1) Probability of doing household work	(2)
Mother's absence		
Beginning of primary	0.173***	0.236*
	(0.060)	(0.124)
Beginning of secondary	−0.127*	−0.236***
	(0.076)	(0.089)
Beginning of primary*male		−0.062
		(0.146)
Beginning of secondary*male		0.273**
		(0.123)
Father's absence		
Beginning of primary	−0.018	−0.037
	(0.019)	(0.030)
Beginning of secondary	−0.030	−0.032
	(0.021)	(0.030)
Beginning of primary*male		0.037
		(0.034)
Beginning of secondary*male		0.005
		(0.036)
Individual level controls	Yes	Yes
Year of birth dummies	Yes	Yes
Family fixed effect	Yes	Yes
Observations	7494	7494

Only children aged 16 or older. Dependent variable: probability of doing household work. In column (2) the coefficients for mother's and father's absence are interacted with a dummy for males. Standard errors clustered at the family level are in parentheses. Significance at the 10% level is represented by *, at the 5% level by **, and at the 1% level by ***

In Table external document, the results for an alternative sample, including only children aged 19 years or older, are shown. This sample shows a lower average attendance rate (relaxing the potential bias coming from comparing children still in school with children already out) at the cost of being smaller in size. Results of the estimation of Eq. (1) for this sample are in line with the previous ones: the mother's absence at 12–13 is the only one that has a significant effect.

6 Concluding remarks

This paper studies the impact of mother's and father's migration to the USA on the well-being of Mexican children, as measured by educational attainment and labor market outcomes.

Table 8 The effect of parental migration on household work and employment

Dependent variable	(1) Probability of being employed	(2)
Mother's absence		
Beginning of primary	−0.170**	−0.302**
	(0.077)	(0.136)
Beginning of secondary	0.204*	0.316**
	(0.121)	(0.139)
Beginning of primary*male		0.171
		(0.156)
Beginning of secondary*male		−0.288*
		(0.166)
Father's absence		
Beginning of primary	0.001	−0.012
	(0.025)	(0.034)
Beginning of secondary	0.016	0.008
	(0.026)	(0.035)
Beginning of primary*male		0.025
		(0.040)
Beginning of secondary*male		0.016
		(0.044)
Individual level controls	Yes	Yes
Year of birth dummies	Yes	Yes
Family fixed effect	Yes	Yes
Observations	7494	7494

Only children aged 16 or older. Dependent variable: probability of working. In column (2) the coefficients for mother's and father's absence are interacted with a dummy for males. Standard errors clustered at the family level are in parentheses. Significance at the 10% level is represented by *, at the 5% level by **, and at the 1% level by ***

The problem of selection into migration is partially solved by exploiting a family fixed-effect strategy, which also ensures that the selection bias arising from the differences between female and male migrant households is adequately taken into account. In practice, treated and controls are defined within the same family, by exploiting the age of each child when one parent was absent because of migration to the USA. This strategy allows me to accurately estimate the effects of the timing of parental absence on children's schooling.

The empirical evidence suggests that mother's migration has an adverse impact on children's schooling achievements. This negative and significant result holds for the mother's absence at ages when the decision on entering a new level of schooling must be taken. Results on the duration of the migration experience confirm that a longer absence of the mother, at specific schooling stages, negatively affects

children's educational achievement. When I use the probability of doing household work and the likelihood to be employed as outcome variables, I find that daughters are likely to 'substitute' the mother when she migrates. More specifically, daughters experiencing mother's migration at a younger age are more likely to do household work, while daughters experiencing mother's migration during adolescence are more likely to declare being employed at the time of the survey.

Descriptive evidence shows that migrant mothers are, on average, more educated than migrant fathers. Possibly, the detected effect operates through the reduction of time spent with the most skilled parent. This conjecture is in line with the results on the duration of the absence: the longer the mother's migration, the less she can exert influence on children's behavior and, consequently, the children will attend less schooling.

The increase in migrant women in response to global changes in the labor market raises relevant policy questions. Women are now more likely to migrate independently and to work abroad to fulfill the demand for cheap female labor, especially as caregivers or to perform other women's work. As this study points out, maternal absence at the initial stages of the educational career can be very detrimental for children's educational attainments, especially for girls. Policymakers should be aware of the possible negative implications of mother's migration, not to prevent women from migration, but rather to design policies compensating for the negative impacts on children left behind.

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Compliance with ethical standards

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References

Angrist, J. D., & Pischke, J.-S. (2014). *Mastering'metrics: the path from cause to effect*. Princeton University Press.

Antman, F. M. (2011). The intergenerational effects of paternal migration on schooling and work: what can we learn from children's time allocations? *Journal of Development Economics Economics*, *96*, 200–208.

Antman, F. M. (2012). Gender, educational attainment, and the impact of parental migration on children left behind. *Journal of Population Economics*, *25*, 1187–1214.

Bansak, C., & Chezum, B. (2009). How do remittances affect human capital formation of school-age boys and girls? *American Economic Review*, *99*(2), 145–148.
Behrman, J. R., Foster, A. D., Rosenweig, M. R., & Vashishtha, P. (1999). Women's schooling, home teaching, and economic growth. *Journal of Political Economy*, *107*, 682–714.
Cerrutti, M., & Massey, D. S. (2001). On the auspices of female migration from mexico to the United States. *Demography*, *38*, 187–200.
Chen, S. H., Chen, Y.-C., & Liu, J.-T. (2009). The impact of unexpected maternal death on education: first evidence from three national administrative data links. *American Economic Review*, *99*(2), 149–153.
Cortes, P. (2015). The feminization of international migration and its effects on the children left behind: evidence from the philippines. *World Development*, *65*, 62–78.
Couch, K. A., & Lillard, D. R. (1997). Divorce, educational attainment, and the earnings mobility of sons. *Journal of Family and Economic Issues*, *18*, 231–245.
Cunha, F., & Heckman, J. J. (2008). Formulating, identifying and estimating the technology of cognitive and noncognitive skill formation. *Journal of Human Resources*, *43*, 738–782.
Datcher-Loury, L. (1988). Effects of mother's home time on children's schooling. *Review of Economics and Statistics*, *70*(3), 367–373.
Duflo, E. (2003). Grandmothers and granddaughters: old-age pensions and intrahousehold allocation in south africa. *World Bank Economic Review*, *17*, 1–25.
Edwards, A. C., & Ureta, M. (2003). International migration, remittances, and schooling: evidence from el salvador. *Journal of Development Economics*, *72*, 429–461.
Ermisch, J. F., & Francesconi, M. (2001). Family structure and children's achievements. *Journal of Population Economics*, *14*, 249–270.
Gertler, P., Levine, D. I., & Ames, M. (2004). Schooling and parental death. *Review of Economics and Statistics*, *86*, 211–225.
Hanson, G. H., & McIntosh, C. (2010). The great mexican emigration. *The Review of Economics and Statistics*, *92*, 798–810.
Hanson, G. H., & Woodruff, C. (2003). Emigration and educational attainment in mexico. *Documento de Trabajo del IR/PS*. http://irpshome.ucsd.edu/faculty/gohanson/working_papers.htm, 1–39.
Haveman, R., & Wolfe, B. (1995). The determinants of children's attainments: a review of methods and findings. *Journal of Economic Literature*, *33*, 1829–1878.
Heckman, J. J. (2006). Skill formation and the economics of investing in disadvantaged children. *Science*, *312*, 1900–1902.
Jonsson, J. O., & Gähler, M. (1997). Family dissolution, family reconstitution, and childrenas educational careers: recent evidence for sweden. *Demography*, *34*, 277–293.
Krein, S. F., & Beller, A. H. (1988). Educational attainment of children from single-parent families: differences by exposure, gender, and race. *Demography*, *25*, 221–234.
Le Goff, M. (2016). Feminization of migration and trends in remittances. *IZA World of Labor*, *220*, 1–10.
Manski, C. F., Sandefur, G. D., McLanahan, S., & Powers, D. (1992). Alternative estimates of the effect of family structure during adolescence on high school graduation. *Journal of the American Statistical Association*, *87*, 25–37.
McKenzie, D., & Rapoport, H. (2011). Can migration reduce educational attainment? Evidence from mexico. *Journal of Population Economics*, *24*, 1331–1358.
McLanahan, S., & Sandefur, G. (2009). *Growing up with a single parent: What hurts, what helps*. Harvard University Press.
Nobles, J. (2013). Migration and father absence: shifting family structure in mexico. *Demography*, *50*, 1303–1314.
Painter, G., & Levine, D. I. (2000). Family structure and youths' outcomes: which correlations are causal? *Journal of Human Resources*, *35*(3), 524–549.
Thomas, D. (1990). Intra-household resource allocation an inferential approach. *Journal of Human Resources*, *25*(4), 635–664.
Thomas, D. (1994). Like father, like son; like mother, like daughter: parental resources and child height. *Journal of Human Resources*, *29*(4), 950–988.
UNICEF (2007). *The state of the world's children 2008: child survival*, Volume 8. Unicef.
Yang, D. (2008). International migration, remittances and household investment: evidence from Philippine migrants' exchange rate shocks. *The Economic Journal*, *118*, 591–630.