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The Impact of Family Structure on Educational Attainment: An Analysis for Mexico Using EMOVI-2017

Martín Finkelstein

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The impact of family structure on educational attainment: an analysis for Mexico using EMOVI-2017 *

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Abstract

Using the 2017 Mexican Social Mobility Survey (ESRU-EMOVI 2017), this study documents how family structure during upbringing is a key determinant of educational results. Individuals raised in two-parent households attain between 0.25 and 0.38 more years of education and show, on average, a two to three percentage point higher probability of completing higher education than their peers raised without one of their parents at home. An analysis of why individuals drop out of the education system indicates that differences in educational attainment may stem from a lack of opportunities. The evidence points to parental death as a significant contributor to this gap. Individuals who lose a parent during their formative years complete, on average, between 0.9 and 1 fewer years of education and are 3 to 5 percentage points less likely to complete higher education. The timing of parental death is critical: experiencing the loss of a parent during adolescence (between ages 13 and 18) is particularly detrimental to the likelihood of achieving key educational milestones.

Keywords: Education and Inequality, Family Structure, Household, Latin America

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1 Introduction

Latin America has a long-standing history of high levels of inequality. This inequality is reflected not only in terms of income, but also in other key dimensions of overall well-being, such as education, health, or even labor market outcomes (De La Mata et al., 2022). These persistent disparities are closely linked to differences in human capital accumulation. Motivated by this issue, the present study analyzes how the family environment during uprbringing affects human capital formation. More specifically, it seeks to examine whether individuals raised in two-parent households show better educational trajectories than their peers raised in non–two-parent family structures.

The data used in this study come from the ESRU-EMOVI 2017 survey, a social mobility survey conducted in Mexico in 2017, representative of men and women aged 25 to 64 across Mexico City and the country's five main regions. A key feature of the survey is that it measures intergenerational social mobility. As such, the questionnaire collects retrospective information on the educational attainment of respondents and their parents [1].

This retrospective approach not only makes it possible to reconstruct educational levels, but also to identify family structure during upbringing, based on who respondents were living with at age 14. The inclusion of these retrospective questions, along with others, such as reasons for leaving school or the timing of a parent's death, sets this dataset apart from other similar datasets and is precisely what allows the study to address its main research questions.

It is important to note that the data set used in this study presents some limitations that hinder a complete understanding of the past family situations of the respondents, as will be discussed in the data section. Consequently, this study does not intend to take a causal approach. However, even from a non-causal perspective, the findings contribute novel insights to the existing literature for two main reasons.

First, there is a lack of evidence on this topic in Latin America. Most studies that explore the relationship between parenting dynamics and the accumulation of human capital focus on trends observed in developed countries (Bertrand and Pan, 2013; Frimmel et al., 2024; Kearney, 2022). Second, the fact that working with non-causal results should not be dismissed as irrelevant, as establishing a causal link between the variables under study is extremely complex. This is why accumulating descriptive evidence across different contexts is useful for identifying patterns and reinforcing stylized facts.

Beyond the main result of the study, this paper is innovative in its attempt to approximate

[1] Educational attainment is not only important per se but also serves as a predictor of many non-pecuniary outcomes (Torche, 2021). In addition, it is straightforward and reliable to collect, especially when working with retrospective questions. Educational variables generally show low measurement error and low rates of non-response (Gasparini et al., 2012) Another advantage is that, after a certain point in the life cycle, they remain relatively stable, unlike measures of income or occupation.

the mechanisms that may lead to different educational trajectories. To that end, it explores the reasons why individuals drop out of the education system, aiming to use those outcomes as a potential explanation for differences in educational attainment and to examine how parenting environments correlate with the reasons underlying school dropout. Additionally, this study also makes a significant contribution to the literature by attempting to measure how a specific disruption in family structure—such as the death of a parent—may impact children's educational outcomes.

Lastly, it is worth emphasizing that this work is relevant for at least two key reasons: equity and efficiency. Equity, one can argue that it is unfair for a person's educational, occupational, or labor outcomes to be shaped by a factor beyond their control (such as the environment where they are born). And efficiency, because being shaped by one's early environment may result in highly skilled individuals or those with a broad set of natural talents not reaching their full potential. In aggregate terms, this would represent a loss for society as a whole.

The document is organized as follows: Section 2 provides a review of the literature related to the topic under study, followed by a presentation of the data used in Section 3 and a discussion of the methodology and main results in Section 4. Section 5 analyzes a particular instance of family structure disruption by examining how the death of a parent affects the respondents' educational trajectories. Section 6, in contrast, focuses on a specific mechanism to explain differences in educational attainment. It explores whether there are differences in the reasons that lead respondents to drop out of school. Finally, Section 7 summarizes the main conclusions of the study.

2 Related literature

This study falls within at least two strands of the literature. First, it is related to research on the determinants of human capital formation, since it examines family structure during childhood as a factor shaping future educational outcomes. Investing in human capital within a household involves allocating both monetary and non-monetary resources to support children's personal and educational development. Financial constraints or limited time available for parenting may play a crucial role in this process. Second, this paper also contributes to the literature on intergenerational mobility. In this regard, the study by Neidhöfer et al. (2018) is a clear reference. Throughout this paper, the authors analyze trends in educational mobility in 18 Latin American countries over more than five decades. Similarly, contributions such as Torche (2021) offer valuable insights, particularly regarding the methodological and conceptual foundations of intergenerational mobility measurement.

As discussed in the previous section, most of the existing literature focuses on developed countries. These studies consistently find that individuals raised in two-parent households tend to achieve better outcomes than their peers from other family structures. Moreover, differences may emerge not only between individuals raised in different types of households but also between population subgroups. Three potential sources of heterogeneity stand out: gender, socioeconomic background, and birth cohort.

There are many relevant studies that delve into the gender dimension. For instance, Kearney (2022) uses data from the United States to examine higher education outcomes and finds that men might be particularly affected by growing up in a household without both parents. Similarly, Bucheli and Vigorito (2023) use data from Uruguay to study separation or divorce events and end up finding that men are the ones most negatively affected in the medium term by parental separation. This finding holds across a broad set of outcome variables used as proxies for well-being, such as education, occupation, and socio-emotional indicators. Along the same lines, studies such as Bertrand and Pan (2013) and Wasserman (2020) reach similar conclusions: men appear to be particularly affected by growing up outside of a two-parent family structure.

The evidence regarding differences according to socioeconomic levels is, on the other hand, less conclusive. Following the findings of Grätz (2017), who uses information from Germany analyzing separation, individuals from disadvantaged socioeconomic backgrounds are particularly affected by the dissolution of the family nucleus. However, studies like Martin (2012), which analyze the U.S. population, find contradictory evidence: those who appear to be most affected by the breakup of the family nucleus are children of more educated parents.

Thirdly, it is also possible to distinguish outcomes according to birth cohorts. As shown in Figure A.1, taken from the GenLAC database (CEDLAS, 2023), which uses data from Mexico's National Household Income and Expenditure Survey, over the past 20 years the proportion of single-parent households has increased by around 5 percentage points. This increase appears to be driven by a rise in the proportion of single-parent households headed by women. There is also a significant increase in the percentage of single-parent households with a female head of intermediate educational attainment. The idea justifying the division by generations is simple: single-parent households from twenty-five or thirty years ago might differ, in observable and unobservable characteristics, from single-parent households of the last ten or fifteen years, for instance[2].

[2] Another interesting point to delve into is the fact that in recent years, educational attendance across the entire region has expanded (Neidhöfer et al., 2018) This could influence the results found if a generational division is not taken into account.

3 Data

As previously noted in the introduction, this study's primary data source is the 2017 Mexican Social Mobility Survey (EMOVI-2017). A distinctive feature of this dataset is the inclusion of retrospective questions. Specifically, respondents are asked to report, looking back from the present, their family structure during childhood and the educational attainment of their parents. This allows us to reconstruct each respondent's family situation at age 14. This information is vital to address the study's research questions, since similar data from other sources (e.g., censuses) usually applies only to individuals who were living with their parents at the time of the survey. Retrospective questions help avoid co-residence bias, which are challenging to overcome in those alternative datasets (Emran et al. (2018) or Emran and Shilpi (2021)). Additionally, this method enables analysis of outcomes beyond adolescence and early adulthood, a period where most existing studies focus [3].

To answer the core research question, the sample is split between individuals raised in two-parent households and those raised in single-parent households. A two-parent environment is defined by the presence of both parents in the home during upbringing, as reported by the respondent, whereas a single-parent environment involves only one parent [4]. Moreover, the EMOVI-2017 includes other unique questions that offer qualitative depth beyond other datasets. These allow us to investigate potential mechanisms explaining observed differences. First, the survey asks whether the respondent experienced the death of a parent and, if so, the age at which this occurred, with questions such as: "Does your mother/father currently live?" and "How old were you when your mother/father died?"

Based on this information, Section 5 explores whether the death of a parent during the formative years (a specific disruption of family structure) helps explain differences in educational attainment. We focus on parental death for two reasons. First, it represents a clear, exogenous shock beyond the individual's control that could plausibly affect educational paths. Second, data availability: EMOVI-2017 includes information on parental death, but not on other family-structure disruptions. Therefore, we caution against generalizing these results to other forms of household change. As noted in the literature (for instance Biblarz and Gottainer (2000)), the impact of parental death may differ significantly from that of divorce or separation.

[3] Focusing exclusively on educational outcomes during adolescence or early adulthood can yield incomplete findings, especially when the aim is to assess higher education attainment. Many individuals continue their educational trajectories beyond these early stages, which would result in underreporting their full achievements.

[4] It is important to recognize that this is not an exhaustive definition within the spectrum of family compositions. Family structures can, and often do, exhibit far greater complexity and dynamism than this static, dichotomous classification suggests.

In contrast, Section 6 shifts focus toward mechanisms underlying educational differences, analyzing reasons for school dropout. EMOVI-2017 includes the question: "You studied up to (last educational level); what was the reason you stopped studying?" This allows us to examine dropout causes and use them to understand possible pathways explaining educational gaps.

Despite its strengths, EMOVI-2017 has some limitations. First, family structure is captured at a single point in time, preventing analysis of transitions or changes that may themselves be traumatic or stressful and impact education. Second, following insights from Kalil et al. (2014) the survey does not capture whether the absence of a parent was partially offset by the presence of other relatives (e.g., grandparents, aunts/uncles). Nonetheless, the information provided remains valuable and highly relevant for this study.

4 Main results

The focus of this study is to determine whether the family environment during upbringing acts as a determinant of respondents' educational outcomes in adulthood. To this end, ordinary least squares (OLS) regressions are estimated using the following equations:

$$Y_i = \beta_0 + \beta_1 \underbrace{\text{BiParental}_i}_{\substack{\text{1 if raised} \\ \text{by both parents}}} + \beta_2 \underbrace{\text{Male}_i}_{\substack{\text{gender of} \\ \text{respondent}}} + \beta_3 \underbrace{\text{ParentEDU}_i}_{\substack{\text{1 if at least} \\ \text{one parent has} \\ \text{"bachillerato"} \\ \text{or higher education}}} + \varepsilon_i \tag{1}$$

$$Y_i = \beta_0 + \beta_1 \text{BiParental}_i + \beta_2 \text{Male}_i + \beta_3 \text{ParentEDU}_i + \beta_4 X_i + \beta_5 \underbrace{\text{Interaction}_i}_{\substack{\text{family structure} \times \\ \text{subgroup variable}}} + \varepsilon_i \tag{2}$$

The dependent variable Y_i captures educational outcomes of the respondent which can be expressed as an ordinal measure (based on the total years of education completed, or as a binary outcome that indicates the probability of having completed specific educational milestones (e.g., "bachillerato" [5] or tertiary education). This dual specification is important because treating education strictly as an ordinal continuous variable can overlook meaningful distinctions at critical educational thresholds. Although years of education offer valuable information, focusing only on the ordinal dimension can mask relevant insights [6]. There-

[5] Bachillerato in Mexico corresponds to approximately 12 years of education or 6 years in addition to primary school

[6] An additional year of education might have different implications if for example a student goes from 3 to 4 years than if a student goes from 11 to 12 years of education and manages to complete an educational level

fore, the analysis also incorporates binary indicators for high school completion and higher education attainment, enabling a more nuanced understanding of educational progression.

Regarding explanatory variables, BiParental is a binary variable equal to 1 if the respondent reports having been raised by both parents and 0 otherwise. Male captures the gender of the respondent, while ParentEDU is a binary variable equal to 1 if at least one parent completed high school or higher, and 0 otherwise. The term X_i denotes a vector of control variables, including functions of the respondent's age, region of residence, rural versus urban upbringing and birth order within the family. Finally, a set of interaction terms is included to assess whether the effect of family structure on education differs by gender, parental socioeconomic status (proxied by education), and birth cohort (with a dummy indicator for respondents older than 40). Standard errors are clustered and robust to heteroskedasticity.

This analysis serves two main purposes. First, to determine whether a statistically significant correlation between educational attainment and family structure during childhood exists, and to test the robustness of this relationship. Second, to explore whether the effect of being raised in different family structures varies between population subgroups (by gender, parental socioeconomic status, and birth cohort). Table 1 presents the results using years of education as the dependent variable.

Table 1: Differential in terms of years of education

	(1)	(2)	(3)	(4)	(5)
Bi-Parental	0.38***	0.39***	0.36***	0.25*	0.29*
	(0.12)	(0.11)	(0.12)	(0.15)	(0.15)
Male	0.87***	0.74***	0.74***	0.52***	0.74***
	(0.10)	(0.09)	(0.09)	(0.20)	(0.09)
Parent Edu		3.68***	3.55***	3.68***	3.68***
		(0.12)	(0.25)	(0.12)	(0.12)
Bi-parental ** Parent Edu			0.16		
			(0.28)		
Bi-parental ** Male				0.28	
				(0.22)	
Older 40 years					-0.04
					(0.24)
Bi-parental ** Older 40 years					0.23
					(0.22)
N	15090	15090	15090	15090	15090

Weighted results. Sample between 25 and 64 years. Robust standard errors
Control by age, region, order of birth, rural

According to Table 1, the coefficient for family structure at the time of upbringing is positive, statistically significant, and relatively stable across all specifications. In other words, growing up in a two-parent household is associated with an increase in education of, on

average, between 0.25 and 0.38 years (depending on the specification), controlling for a range of observable variables. Interaction terms, while not negligible in magnitude, do not appear to be statistically significant. In other words, no meaningful differences in educational achievement are observed within analyzed subsamples.

When the probability of completing bachillerato is used as the dependent variable, the logic of the results remains largely unchanged. The interpretation of the coefficients shifts, now indicating that growing up in a two-parent household is associated with an increase of between 4 and 5 percentage points in the likelihood of completing bachillerato, but the overall conclusion holds. That is, the family structure variable remains positive and significant across all specifications, no differences emerge in the interaction terms, and no variation across birth cohorts.

Table 2: Differential in probability of completing bachillerato

	(1)	(2)	(3)	(4)	(5)
Bi-Parental	0,05***	0,05***	0,05***	0,04**	0,04*
	(0,02)	(0,02)	(0,02)	(0,02)	(0,02)
Male	0,10***	0,09***	0,09***	0,08**	0,09***
	(0,01)	(0,01)	(0,01)	(0,03)	(0,01)
Parent Edu		0,43***	0,44***	0,43***	0,43***
		(0,02)	(0,03)	(0,02)	(0,02)
Bi-parental ** Parent Edu			-0,01		
			(0,04)		
Bi-parental ** Male				0,02	
				(0,03)	
Older 40 years					0,00
					(0,03)
Bi-parental ** Older 40 years					0,01
					(0,03)
N	15090	15090	15090	15090	15090

Weighted results. Sample between 25 and 64 years. Robust standard errors
Control by age, region, order of birth, rural

Lastly, when defining as the dependent variable the probability that a person completes any form of higher education (whether tertiary or university), the results slightly shift. The first three specifications show that growing up in a two-parent household is associated with an average increase of two to three percentage points in the probability of completing higher education. However, the most notable change is that the gender interaction coefficient becomes significant. From this, we conclude that men seem to experience a benefit, in terms of likelihood of completing higher education, from having been raised in a household with both

parents present.

Table 3: Differential in probability of completing higher education

	(1)	(2)	(3)	(4)	(5)
Bi-Parental	0,03***	0,03***	0,02***	0,01	0,03
	(0,01)	(0,01)	(0,01)	(0,01)	(0,02)
Male	0,04***	0,03***	0,03***	-0,01	0,03***
	(0,01)	(0,01)	(0,01)	(0,02)	(0,01)
Parent Edu		0,33***	0,30***	0,33***	0,33***
		(0,02)	(0,04)	(0,02)	(0,02)
Bi-parental ** Parent Edu			0,05		
			(0,04)		
Bi-parental ** Male				0,05**	
				(0,02)	
Older 40 years					-0,03
					(0,02)
Bi-parental ** Older 40 years					0,02
					(0,02)
N	15090	15090	15090	15090	15090

Weighted results. Sample between 25 and 64 years. Robust standard errors
Control by age, region, order of birth, rural

In the following sections, we analyze key mechanisms that may explain differences in educational achievement among respondents. Section 5 explores variation in educational outcomes associated with the death of one or both parents, while Section 6 examines differences in the underlying causes and patterns of school dropout.

5 Changes in family structure: Parental death

A tentative preliminary conclusion, grounded in the evidence presented throughout the previous section, is that individuals raised in two-parent households tend to experience better educational outcomes compared to those raised in other family structures. Nonetheless, as noted in the introduction, these conclusions are constrained by the limitations of the available data. Specifically, we cannot fully reconstruct the respondents' family circumstances during their upbringing. The EMOVI-2017 survey partially addresses this gap by including information on parental death, allowing us to delve deeper into this specific form of family structure disruption. This section aims to determine whether educational outcomes differ between respondents who experienced the death of a parent during their formative years and those who did not.

Parental death can logically impact the development of human capital through multiple channels, such as economic strain, reduced adult supervision, and emotional shocks, among others. Following frameworks such as Bucheli and Vigorito (2023) and the empirical analysis of De La Mata et al. (2022) in Peru, where the effects of parental death or divorce on children's education are examined, there is evidence to think that it is crucial to consider the timing of such shocks. The underlying intuition is that an individual who loses a parent after completing their education should not experience the same impact on their likelihood of finishing secondary school as someone who suffers parental loss during childhood or early adolescence. For the latter, the disruption comes at a critical stage of the educational trajectory.

Therefore, considering the importance of addressing the results with a temporal perspective, the regressions used in this section will be:

$$Y_i = \beta_0 + \beta_1 \underbrace{\text{i.Parental Death}}_{\text{Categorical variable}} + \beta_2 \text{Male}_i + \beta_3 \text{ParentEDU}_i + \varepsilon_i \tag{3}$$

$$Y_i = \beta_0 + \beta_1 \text{i.Parental Death} + \beta_2 \text{Male}_i + \beta_3 \text{ParentEDU}_i + \beta_4 X_i + \beta_5 \underbrace{\text{Interaction}_i}_{\substack{\text{Parental Death} \times \\ \text{subgroup variable}}} + \varepsilon_i \tag{4}$$

The methodology is very similar to the one proposed in Section 4, with the key distinction that instead of the general family structure coefficient, this section introduces a series of binary variables indicating whether the individual lost their father or mother throughout their childhood (up to 12 years old), adolescence (ages 13-18), or early adulthood (ages 19–24). These are compared with individuals who did not experience parental death before turning 25. The results are summarized in Tables 4, 5 and 6, where both the coefficient estimates and, crucially, the timing of the event are of interest.

As a preliminary note, the sample size in this analysis is smaller than in previous exercises, as reflected in the "N" row. This is because, for a small subset of observations (approximately 10% of the sample), it was not possible to collect the age of the respondent at the time of their parents' death.

Table 4 presents results using educational attainment (measured by years of schooling) as the dependent variable. Individuals who lost a parent during childhood or adolescence attain, on average, lower educational levels than those who had both parents alive at age 25. The loss of a parent between the ages 19 and 24 shows smaller and less consistent effects in all specifications. More precisely, those who lost a parent before age 12 report approximately 0.8 fewer years of education, and those who experienced parental loss between ages 13 and 18 report between 0.9 and 1 full year less than their peers who did not lose a parent before age

25. Interaction terms with gender and socioeconomic status reveal no significant subgroup differences.

Table 4: Educational attainment gaps by parental death, using the respondent's years of education as a reference.

	(1)	(2)	(3)	(4)	(5)
P. Death less than 12	-1,02***	-0,78***	-0,78***	-0,77**	0,00
	(0,24)	(0,23)	(0,25)	(0,32)	(0,37)
P. Death 13 to 18	-1,11***	-0,99***	-0,97***	-0,90***	-1,09**
	(0,32)	(0,30)	(0,33)	(0,26)	(0,52)
P. Death 19 to 24	-0,64***	-0,50**	-0,37*	-0,45	-0,23
	(0,20)	(0,21)	(0,22)	(0,28)	(0,31)
Male	0,87***	0,73***	0,73***	0,75***	0,72***
	(0,10)	(0,10)	(0,10)	(0,10)	(0,10)
Parent Edu		3,55***	3,59***	3,55***	3,56***
		(0,13)	(0,13)	(0,13)	(0,13)
Interaction less than 12			0,02	-0,01	-1,39***
			(0,65)	(0,46)	(0,47)
Interaction 13 to 18			-0,15	-0,20	0,17
			(0,66)	(0,65)	(0,62)
Interaction 19 to 24			-0,93	-0,10	-0,61
			(0,60)	(0,42)	(0,40)
N	12461	12461	12461	12461	12461
Interaction Parent Edu	No	No	Yes	No	No
Interaction gender	No	No	No	Yes	No
Interaction age	No	No	No	No	Yes

Weighted results. Sample between 25 and 64 years. Robust standard errors
Control by age, region, order of birth, rural

Table 5 examines the probability of completing "bachillerato" education. A significant negative correlation emerges for those who lost a parent during their childhood (a 9 to 11 percentage point decrease) or adolescence (an 8 to 10 percentage point decrease), compared to those who did not lose a parent before 25 years of age. No significant effects are observed for parental loss at ages 19–24. Furthermore, interaction effects within subgroups remain insignificant.

Table 5: Differences in the probability of completing bachillerato based on having experienced parental death

	(1)	(2)	(3)	(4)	(5)
P. Death less than 12	-0,13***	-0,10***	-0,11***	-0,09**	-0,06
	(0,03)	(0,03)	(0,03)	(0,04)	(0,06)
P. Death 13 to 18	-0,10***	-0,08***	-0,08***	-0,09***	-0,10**
	(0,03)	(0,03)	(0,03)	(0,03)	(0,05)
P. Death 19 to 24	-0,04	-0,02	0,00	-0,05	0,01
	(0,03)	(0,03)	(0,03)	(0,04)	(0,05)
Hombre	0,10***	0,09***	0,09***	0,09***	0,09***
	(0,01)	(0,01)	(0,01)	(0,01)	(0,01)
Parent Edu		0,43***	0,43***	0,43***	0,43***
		(0,02)	(0,02)	(0,02)	(0,02)
Interaction less than 12			0,08	-0,02	-0,07
			(0,08)	(0,06)	(0,07)
Interaction 13 to 18			0,01	0,01	0,04
			(0,08)	(0,06)	(0,06)
Interaction 19 to 24			-0,16	0,05	-0,08
			(0,10)	(0,06)	(0,06)
N	12461	12461	12461	12461	12461
Interaction Parent Edu	No	No	Yes	No	No
Interaction gender	No	No	No	Yes	No
Interaction age	No	No	No	No	Yes

Weighted results. Sample between 25 and 64 years. Robust standard errors
Control by age, region, order of birth, rural

Finally, Table 6 investigates the likelihood of completing higher education. Those who experienced parental death between the ages of 13 and 18 have a 5-point lower probability of completing higher education, while those who lost a parent in early adulthood (19-24) have a 3 to 5-point lower likelihood of finishing the same level. Childhood loss shows no significant association. In column (3), the interactions with parental socioeconomic status are significant and negative: individuals from more educated families who lose a parent during adolescence or early adulthood are disproportionately affected.

Table 6: Differences in the probability of completing higher education based on experiencing parental death

	(1)	(2)	(3)	(4)	(5)
P. Death less than 12	-0,05**	-0,03	-0,02	-0,02	0,01
	(0,02)	(0,02)	(0,02)	(0,03)	(0,04)
P. Death 13 to 18	-0,06***	-0,05***	-0,03	-0,04**	-0,07**
	(0,02)	(0,02)	(0,02)	(0,02)	(0,03)
P. Death 19 to 24	-0,07***	-0,05***	-0,03**	-0,04*	-0,06**
	(0,02)	(0,02)	(0,01)	(0,02)	(0,03)
Male	0,05***	0,03***	0,03***	0,04***	0,03***
	(0,01)	(0,01)	(0,01)	(0,01)	(0,01)
Parent Edu		0,33***	0,35***	0,33***	0,33***
		(0,02)	(0,02)	(0,02)	(0,02)
Interaction less than 12			-0,11	-0,03	-0,08*
			(0,10)	(0,04)	(0,05)
Interaction 13 to 18			-0,18***	-0,03	0,04
			(0,07)	(0,04)	(0,04)
Interaction 19 to 24			-0,19**	-0,03	0,02
			(0,07)	(0,04)	(0,03)
N	12461	12461	12461	12461	12461
Interaction Parent Edu	No	No	Yes	No	No
Interaction gender	No	No	No	Yes	No
Interaction age	No	No	No	No	Yes

Weighted results. Sample between 25 and 64 years. Robust standard errors
Control by age, region, order of birth, rural

Additionally, I analyze the difference in the probability of completing secondary education (which serves as an intermediate level between primary education and "bachillerato"). A significant negative correlation is observed for parental death during childhood and adolescence, but not for early adulthood.

As a robustness check, I replicate the analysis from Section 4, but this time, classifying individuals as having been raised outside of two-parent households if they did not have both parents in their home at age 14, yet did not report the death of either parent before that age. This new group includes individuals who lacked both parents due to reasons other than death, such as divorce, abandonment, or separation. While there is a lack of precise information on other causes of family structure disruption beyond death, these tables aim to assess whether other forms of family breakdown impact educational outcomes. The results using this new sample do not reveal a clear pattern of differences in educational achievements. The statistical significance of the coefficients of interest varies depending on the specification used. Tables A.1, A.2 and A.3 in the annex document these results, estimating differences in

years of education, the probability of completing "bachillerato" education, and the probability of completing higher education, respectively. These findings suggest that parental death is the primary factor underlying the relationship between family structure during upbringing and educational outcomes.

6 School dropout dynamics

Much has been written about the benefits of education. More educated individuals tend to have better outcomes across various dimensions of well-being, such as income, housing, health, and employment. Choosing to leave the educational system prematurely is rarely an optimal decision. Therefore, it is crucial to examine the reasons behind a person's decision to discontinue their educational journey. Building upon the findings presented in Sections 4 and 5, this section delves deeper into the mechanisms underlying the observed educational disparities. Drawing from the EMOVI survey, a question categorizes reasons for leaving the educational system into two main groups: opportunity-related reasons and non-opportunity-related reasons. A detailed breakdown of these categories is provided in the Annex.

The rationale behind this analysis aligns with the perspectives of Martin (2012) and Frimmel et al. (2024), who suggest that family environments differ in fundamental aspects like intergenerational closeness and support for academic tasks. From this, one can infer the idea that non-bi-parental environments may be settings with fewer incentives, or where children receive less stimulation, which may translate into different reasons for dropping out of school—even when controlling for region, socioeconomic level, and other relevant factors. To present the results, the following equations are used, incorporating four specifications per exercise:

$$SchoolDropout = \beta_0 + \beta_1 \text{BiParental} + \beta_2 \text{Male}_i + \beta_3 \text{ParentEDU}_i + \varepsilon_i \tag{5}$$

$$SchoolDropout = \beta_0 + \beta_1 \text{BiParental} + \beta_2 \text{Male}_i + \beta_3 \text{ParentEDU}_i + \beta_4 X_i + \beta_5 \text{Interaction} + \varepsilon_i \tag{6}$$

In these equations, the dependent variable is a binary indicator of school dropout due to lack of opportunities, coded as 1 when an individual reports leaving education for opportunity-related reasons. The second specification replaces the BiParental variable with the previously mentioned parental death variable from Section 5. This approach combines the analyses from Sections 4 and 5 to assess whether individuals who experienced parental loss during formative years drop out for different reasons compared to their peers. Two definitions of opportunity-related school dropout are utilized: one more lenient and the other stricter, both detailed in the annex. Summary statistics of dropout reasons are presented in Table A.4 in the annex.

Table 7, however, summarizes the probability of dropping out due to opportunity-related reasons. The first four columns adopt a "lenient" (L) perspective, while the last four columns use a "stricter" (S) perspective on dropout criteria.

The analysis reveals several noteworthy patterns. First, gender appears to play an important role, with males showing a 7 to 9 percentage point lower likelihood of dropping out for opportunity-related reasons compared to their female counterparts. Second, parental education emerges as a strong factor: individuals whose parents have higher educational attainment are 35 to 42 percentage points less likely to discontinue their studies due to limited opportunities, depending on the model specification. Finally, family structure also matters—those raised in two-parent households are 4 to 6 percentage points less likely to leave school for opportunity-related reasons than peers from non-biparental family settings.

Table 7: Probability of dropping out of the education system due to lack of opportunities

	(L1)	(L2)	(L3)	(L4)	(S1)	(S2)	(S3)	(S4)
Bi-Parental	-0,06***	-0,06***	-0,05**	-0,06**	-0,04**	-0,04**	-0,03	-0,04
	(0,02)	(0,02)	(0,02)	(0,02)	(0,02)	(0,02)	(0,02)	(0,02)
Parent Edu	-0,35***	-0,36***	-0,35***	-0,35***	-0,42***	-0,42***	-0,42***	-0,42***
	(0,01)	(0,03)	(0,01)	(0,01)	(0,02)	(0,03)	(0,02)	(0,02)
Male	-0,09***	-0,09***	-0,07***	-0,09***	-0,09***	-0,09***	-0,07***	-0,09***
	(0,01)	(0,01)	(0,03)	(0,01)	(0,01)	(0,01)	(0,03)	(0,01)
Bi-Parental ** Parent Edu	0,00							
	(0,04)							
Bi-Parental ** Male		-0,02				-0,03		
		(0,03)				(0,03)		
Older 40 years			-0,03				-0,00	
			(0,04)				(0,04)	
Bi-Parental ** Older 40 years			0,00				-0,01	
			(0,03)				(0,03)	
N	15086	15086	15086	15086	15086	15086	15086	15086

Lastly, when examining the probability of dropping out of the educational system due to opportunity-related reasons among individuals who experienced parental death during formative years, similar results are found. The timing of their parents' death appears to be a significant factor. Specifically, individuals who lost a parent between ages 13 and 18 have a 10 to 12 percentage point higher probability of dropping out for opportunity-related reasons compared to those who did not experience parental loss before age 25. Those who lost a parent during childhood also show a higher probability of dropping out, although this correlation is not consistent across all specifications.

Table 8: Probability of dropping out of the education system due to lack of opportunities.

Parental Death

	(S1)	(S2)	(S3)	(S4)
Death before age 12	0.11***	0.11***	0.07	0.07
	(0.04)	(0.04)	(0.06)	(0.06)
Death between age 13 and 18	0.10***	0.11***	0.12***	0.10*
	(0.03)	(0.04)	(0.04)	(0.06)
Death between age 19 and 24	0.05	0.03	0.08*	0.03
	(0.03)	(0.03)	(0.05)	(0.05)
Interaction less than 12		-0.08	0.09	-0.02
		(0.07)	(0.07)	(0.03)
Interaction 13 to 18		-0.06	-0.04	0.06
		(0.07)	(0.07)	(0.08)
Interaction 19 to 24		-0.15	-0.06	0.03
		(0.10)	(0.06)	(0.06)
N	12457	12457	12457	12457
Interaction with Parent Edu	No	Yes	No	No
Interaction with Gender	No	No	Yes	No
Interaction with Generation	No	No	No	Yes

These findings underscore the importance of family structure and parental involvement in educational outcomes. Disruptions such as parental death during critical developmental periods can significantly impact a student's likelihood of remaining in the educational system.

7 Concluding remarks

This study has focused on analyzing differences in educational attainment based on family structure during upbringing. The findings indicate that individuals raised in two-parent households, on average, achieve higher educational outcomes than their peers. This educational premium is consistent across multiple definitions of attainment, whether measured in continuous years of education or through thresholds such as completion of secondary or tertiary levels. Contrary to expectations in the existing literature, this paper does not observe significant differences within subgroups, such as the gender of the respondents, socioeconomic status or birth cohort, except in one case: completion of tertiary education. Here, men appear to specifically benefit from having two parents during their upbringing.

The analysis of parental death also yields valuable information. Experiencing the loss of a parent is associated with poorer educational outcomes, and the timing of the loss matters. Closer proximity to key educational decisions (e.g., transition between levels) seems especially impactful. Finally, regarding the probability of completing higher education, individuals from more educated backgrounds face a disproportionate loss in attainment when they experience parental death during adolescence or early adulthood. Moreover, in terms of school dropout dynamics, there is a negative correlation between being raised in a two-parent household and the likelihood of leaving the educational system for opportunity-related reasons. Additionally,

parental death plays a significant role in dropout probability—particularly when the loss occurs between ages 13 and 18.

This research makes an original contribution to the literature by quantifying a source of educational inequality from a relatively underexplored perspective in the region. Potential extensions to this current work might be, for example, examining parenting practices, other forms of family disruption, or inter generational proximity. Future work could replicate these analyses using data from other Latin American countries, such as Argentina's ENES 2014 or the 2021 CAF survey covering ten major cities, to assess the broader relevance of these findings. Additionally, one could explore whether a gender difference exists regarding the death of parents (an analysis not conducted in the present study due to the limited number of observations)

Also, one can recognize a number of relevant policy implications. First, it should not be overlooked that what is explored throughout the study remains a source of inequality beyond individuals' control or choice: no one can choose the environment in which they are raised. Because it is not possible to fully identify the mechanisms conditioning these differences, the proposed lines of action may be incomplete. However, it is clear that interventions aimed at ensuring support and educational continuity for people who lose one of their parents during their formative years, or who experience the breakdown of their family unit for other reasons, would be useful. Finally, it would also be valuable to work toward ensuring that the reasons individuals leave the education system are not conditioned to a lack of opportunities, and above all, to consider gender differences when addressing this issue.

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8 Annex

Figure A1: Share of household according to head of household

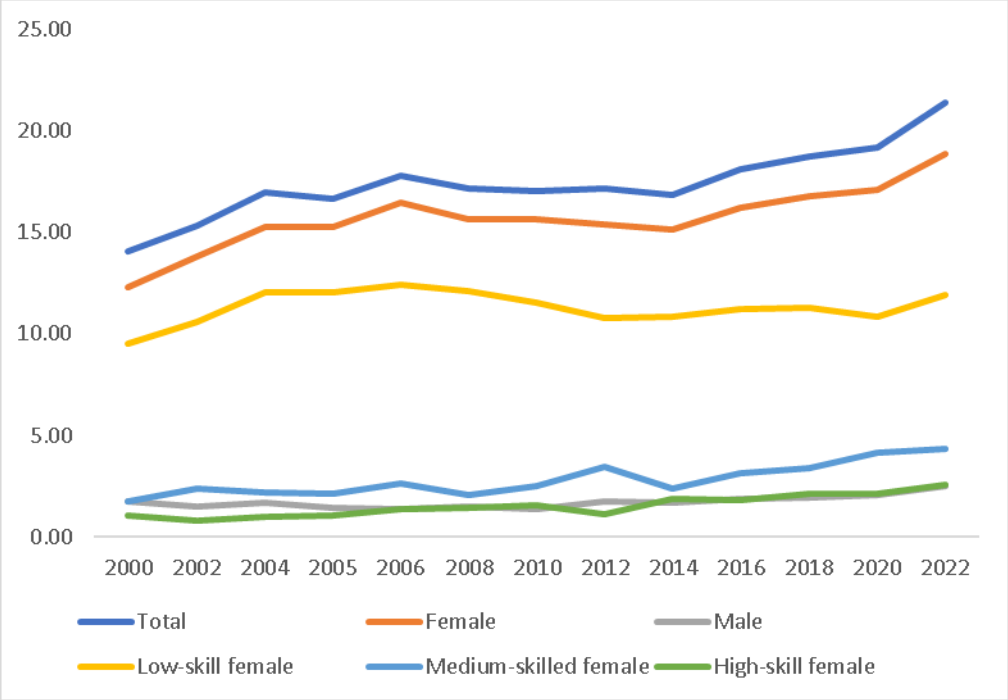

Table A1: Differentials in years of education (modified sample)

	(1)	(2)	(3)	(4)	(5)
Bi-Parental	0.12	0.25*	0.19	0.10	0.31*
	(0.15)	(0.14)	(0.19)	(0.19)	(0.19)
Male	0.85***	0.73***	0.73***	0.48*	0.73***
	(0.10)	(0.10)	(0.10)	(0.26)	(0.10)
Parent Edu		3.60***	3.37***	3.60***	3.60***
		(0.13)	(0.32)	(0.13)	(0.13)
Bi-Parental * Parent Edu			0.27		
			(0.35)		
Bi-Parental * Male				0.29	
				(0.28)	
Bi-Parental * Older 40 years					-0.16
					(0.28)
N	12533	12533	12533	12533	12533

Table A2: Differential in probability of completing bachillerato (modified sample)

	(1)	(2)	(3)	(4)	(5)
Bi-Parental	0.03	0.04*	0.03	0.06**	0.06**
	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)
Male	0.10***	0.09***	0.09***	0.08*	0.09***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
Parent Edu		0.43***	0.41***	0.43***	0.43***
		(0.02)	(0.04)	(0.02)	(0.02)
Bi-Parental * Parent Edu			0.02		
			(0.05)		
Bi-Parental * Male				0.02	
				(0.04)	
Older 40 years				0.05	
				(0.05)	
Bi-Parental * Older 40 years					-0.05
					(0.04)
N	12533	12533	12533	12533	12533

Weighted results. Sample between 25 and 64 years. Robust standard errors
Control by age, region, order of birth, rural or urban
*** p<0.01, ** p<0.05, * p<0.1

Table A3: Differential in probability of completing higher education (modified sample)

	(1)	(2)	(3)	(4)	(5)
Bi-Parental	0.02	0.03**	0.03**	0.00	0.03
	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)
Male	0.05***	0.03***	0.03***	-0.02	0.03***
	(0.01)	(0.01)	(0.01)	(0.03)	(0.01)
Parent Edu		0.34***	0.33***	0.34***	0.34***
		(0.02)	(0.05)	(0.02)	(0.02)
Bi-Parental * Parent Edu			0.01		
			(0.05)		
Bi-Parental * Male				0.06*	
				(0.03)	
Older 40 years				-0.05	
				(0.03)	
Bi-Parental * Older 40 years					0.02
					(0.03)
N	12533	12533	12533	12533	12533

Weighted results. Sample between 25 and 64 years. Robust standard errors
Control by age, region, order of birth, rural or urban
*** p<0.01, ** p<0.05, * p<0.1

Table A4: Distribution of opportunity-related reasons for dropping out of the education system

Reason	**Women**	**Men**
My family did not support me in continuing	14.05%	10.33%
I formed a partnership, got married, or had a child	8.98%	4.20%
I devoted myself to household tasks	6.59%	1.16%
I emigrated and did not continue studying	1.28%	1.96%
Work prevented me from continuing my studies	5.43%	15.00%
I did not enjoy studying	5.85%	7.60%
I lacked the financial resources	48.20%	51.84%
The school was too far from my home	4.54%	3.08%
I had very low academic performance	1.81%	2.44%
I had a poor result on the entrance exam	0.28%	0.49%
My GPA was not high enough to continue	0.35%	0.41%
Other reason	2.50%	1.42%

Questions used to measure family structure during upbringing

- When you were 14 years old, who did you live with?
- Who was the main breadwinner in your household when you were 14 years old?

Questions used to measure school dropout dynamics

1. My family did not support me in continuing
2. I formed a partnership, got married, or had a child
3. I devoted myself to household tasks
4. I had already achieved my educational goal
5. I emigrated and did not continue studying
6. Work prevented me from continuing to study
7. I did not like studying
8. I lacked the financial resources
9. The school was to far from home
10. I had very low academic performance

11. I had a poor result on the entrance exam
12. My GPA was not high enough to continue
13. Other reason

Definitions of school dropout related to lack of opportunities

- Respondent who dropped out of school for reasons 1, 2, 3, 5, 6, 8, 9, 10, 11, 12
- Respondent who dropped out of school for any reason other than having already achieved their educational goal