

# The (non) impact of education on marital dissolution

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Volume 14, numéro 4, 2022

URI : <https://id.erudit.org/iderudit/1113848ar>

DOI : <https://doi.org/10.15353/rea.v14i1.1803>

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Éditeur(s)

International Centre for Economic Analysis

ISSN

1973-3909 (numérique)

[Découvrir la revue](#)

Citer cet article

Aguirre, E. (2022). The (non) impact of education on marital dissolution. *Review of Economic Analysis*, 14(4), 503–523. <https://doi.org/10.15353/rea.v14i1.1803>

## Résumé de l'article

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# The (non) impact of education on marital dissolution

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Despite the relevant role attributed to education on marital outcomes, literature does not show a generalized consensus regarding a positive or negative effect from education on marital decisions with findings differing across countries and linked to differences in several factors such as the labour market conditions, social policies and strictness of divorce legislation. In this paper I investigate the impact of education on marriage dissolution exploiting a change in the length of compulsory education in Mexico in 1993 as an instrument for education. The federal government increased compulsory education from completion of primary school, sixth grade, to completion of secondary school, ninth grade, at a national level. In the first part of the analysis, the probit models show education is significant and negatively correlated to the probability of marital breakdown. An additional year of education is associated with a decrease between 0.6 and 0.9 percentage points in the probability of marital disruption for the 2002-2012 period. However, the results using the instrumental variables methodology indicate an additional year of schooling has no effect on the probability of marriage dissolution. This finding demonstrates the relationship between education and divorce is not causal in Mexico, suggesting although higher levels of education are an undeniable trait observed in non-broken marriages, it is not education by itself one of the mechanisms leading to better marriage outcomes in a Latin American country.

*Keywords:* Marriage; Marital Dissolution; Education; Instrumental Variables; Mexico.

*JEL Classifications:* C26; J12; I26

## 1 Introduction

Significant research has been carried out to determine the effect of different factors influencing divorce decisions. Evidence suggests female labour force participation, family structure and costs of divorce, amongst others, have an impact on marital dissolution (Chiappori et al. 2009; Dahl and Moretti 2008; Freiden 1974). Education has traditionally been identified as one of the main traits determining marriage outcomes. The accumulated level of schooling each partner

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\* Institute for Social and Economic Research, University of Essex. I gratefully acknowledge Karen Mumford, Thomas Cornelissen, Emma Tominey and participants at various seminars, for helpful comments; as well as the financial support provided by the Mexican Council of Science and Technology (CONACYT). I especially thank an anonymous referee and to Editor Jurek Konieczny for precise comments and suggestions.

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brings into the marriage is an important predictor of marriage stability. A higher level of schooling from either the wife or the husband stabilizes the marriage, as does complementarity in the schooling levels of the two partners (Weiss and Willis 1997). Education is also seen as an insurance against a bad marriage. The disparities in earning power and education across genders have contributed to create a vulnerable economic position for married women and women in bad marriages typically face one of two fates: either divorce and struggle as low-income single mothers or remain trapped in the marriage. In this sense education provides a route to emancipation for women (Guvenen and Rendall 2015). However, literature does not show a generalized consensus regarding a positive or negative effect from education on marital decisions. Marriages between highly educated individuals have greater gains given the spouses' higher levels of market and nonmarket skills. On the contrary, they have lower gains because they typically involve less specialization between spouses with higher educated individuals participating more in the labour force. Consequently, there is no clear theoretical prediction about the net effect of schooling level on the gains from marriage (Becker et al. 1977).

It has been argued higher educated individuals are better equipped to deal with divorce costs. It can be easier for them to understand and handle the legal process, feeling less risk averse to take the divorce decision and be more prone to file for divorce (Hoem and Hoem 1992). In addition, moral objections against divorce tend to lessen for individuals with higher levels of education and an increased confidence exists about setting up a new and independent home (Kalmijn and Poortman 2006).

In contrast, higher-educated men have more liberal views on women's work and are generally more willing to participate in child rearing. This makes them more attractive to higher educated women, leading to more satisfaction in their marriages and lowering the divorce risk (Kalmijn 2003). Supporting this approach, education may increase the marriage benefits as well-educated couples can interact better and build up stronger relationships, improving their marriage quality (Amato 1996).

Empirical efforts have been devoted to analyse the role of education on marriage outcomes. Initially for the United States an ambiguous effect between education and marital dissolution is found (Becker et al. 1977). Later on, the influence of various socioeconomic and demographic factors on the probability of marital disruption, including education, is estimated for young black and white women aged 14 to 24 who were married at any point between 1968 and 1973. For both groups, the negative association between education and marital disruption probabilities is highly significant (Mott and Moore 1979). More recently, trends in marriage dissolution rates by educational level for American women during 1975 to 1994 have been measured. Results indicate marital dissolution rates fell among women with a 4-year college degree or more, but remained high among women with less than a 4-year college degree (Martin 2006). Expanding the research to analyse not only the United States but also additional countries, findings for Austria and Lithuania support the conclusion that women with higher

levels of education face a lower divorce risk. However, data for France, Greece, Italy, Poland, and Spain, indicates the opposite, with a positive divorce educational gradient. Other countries such as Estonia, Finland, West-Germany, Hungary, Latvia, Sweden and Switzerland show no relationship between education and divorce (Harkonen and Dronkers 2006). Using data for the United Kingdom, Berrington and Diamond (1999) confirm the hypothesis of a positive association between education and marital stability, but the effect is reduced once early marital factors such as the age at marriage and childbearing status are included in the model. Hewitt, Baxter and Western (2005) analyse social factors associated with marital breakdown in Australia. The authors find higher education reduces the probability of divorce for men, increasing marriage stability. In contrast, women with a bachelor's degree or higher qualifications face a higher probability of marriage breakdown than women in the lowest educational levels, allowing educated women to leave an unsatisfactory marriage.

Causal evidence has also been provided. Oreopoulos and Salvanes (2011) estimate the causal effect of schooling on various outcomes including divorce. Exploiting changes in the United States compulsory schooling laws over time as an instrument for education, results indicate compulsory schooling decreases the chances of being divorced. In addition, using Norwegian data, findings show siblings and twins with more schooling are less likely to be divorced.

The evidence shows the effect of education on marital stability varies across countries and it is linked to differences in several factors such as the labour market conditions, social policies and strictness of divorce legislation. However, to the best of my knowledge, none of these studies have analysed this relationship in a Latin American setting. This is not surprising. In contrast to other countries, the Latin American region has lagged behind in terms of amendments to their divorce legislation and only recently divorce rates have started exhibiting remarkably upward trends (Aguirre, 2019). This paper aims to stimulate interest in the region, with more research taking place to better understand the role education plays in the Latin American context not only as a financial driver, but also considering its nonpecuniary benefits.

Latin America is characterized by deep structural problems in the economic, social and political spheres with high levels of persistent poverty and income inequality. Although diversity needs to be acknowledged, the common undeniable traits among the Latin American region, make the study of one of its countries an interesting reference point.

The analysis is conducted in two parts. First, different probit model specifications are estimated to examine the impact of education and other divorce determinants, on the likelihood of marital dissolution in Mexico. Later, to identify not only the impact of education on marital disruption but its causal effect, following Oreopoulos and Salvanes (2011), the use of an instrumental variable for education is incorporated into the analysis due to the potential omitted-variable bias in the model.

The length of compulsory education was raised in Mexico in 1993. The federal government increased compulsory education from completion of primary school, sixth grade, to completion of secondary school, ninth grade,<sup>1</sup> at a national level. The modification in 1993 is an exceptional opportunity to create an instrument for education in Mexico, exploiting the change in the law as an exogenous variation in the number of years of schooling.

The results obtained from the probit specifications indicate an additional year of education reduces the probability of marital breakdown between 0.6 and 0.9 percentage points. However, when determining its causal effect, the estimates indicate education does not have a statistically significant effect on the probability of marital dissolution, suggesting it is not education by itself one of the mechanisms leading to better marriage outcomes in Mexico.

The paper is organized as follows: Section 2 presents the data. In Section 3 the estimation strategy is discussed, followed in Section 4 and Section 5 by the empirical findings. Section 6 concludes.

## 2 Data

The Mexican Family Life Survey (MxFLS) is the first longitudinal, multi-thematic survey representative of the Mexican population at national, urban, rural and regional levels. The MxFLS collects information on a wide range of socioeconomic and demographic indicators at the individual, household, and community level, providing retrospective information on education and marriage amongst others, for each of the individuals comprising the sample. There have been three rounds: 2002, 2005-2006 and 2009-2012, and the data for this 10-year period is public.<sup>2</sup>

A common problem researchers face in Mexico is the lack from suitable data. The possibility to conduct research using the information from the Mexican Family Life Survey is a unique opportunity to understand in more detail the structure of the families in the country, especially since the MxFLS third round, according to the original design of the MxFLS survey, probably will be the last one collected.

The dependent variable in the analysis is marital status ( $D_s$ ), defined as 1 if the person has ever been divorced or separated from marriage<sup>3</sup> or 0 if is currently married with no previous divorce or separation history. The main independent variable, education, is a measure of the number of years of schooling ( $Ed$ ). This is the standard approach followed in most of the

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<sup>1</sup> In Mexico children enter primary school at age six and typically finish secondary education around age 14 or 15.

<sup>2</sup> [www.ennvih-mxfls.org](http://www.ennvih-mxfls.org).

<sup>3</sup> The MxFLS allows to distinguish from those separated from marriage and those separated from cohabitation. Typically, studies consider separated individuals as part of their divorced subsample (Becker et al. 1977; Marinescu 2015). Therefore, for this study divorced and separated persons are treated as part of the same group.

relevant literature and in here it has been computed using the available information on the latest level of schooling reached by the individual, the latest grade concluded and if the person obtained the certificate of completion for some levels of education (high school, undergraduate and postgraduate).

As the MxFLS is a household survey, including all the available observations in the analysis would lead to double counting married individuals from the same household. To define an appropriate strategy to identify the impact education has on the probability of marital dissolution and to deal with a potential distortion generated if duplicated observations from a household were considered when keeping the information for the husband and also for the wife, the strategy followed is to use the record of the individual in the household with the highest level of education. Then if the wife has 8 years of education, but the husband has 9 years, the information of the latter is used.

A typical approach is to conduct the analysis separately for women and men. However, due to sample size, the *highest educated* option is considered the most suitable path to follow. Although this is the main strategy, robustness checks are also provided using the average level of education for married couples and the gender strategy, splitting the dataset between women and men. The purpose is to compare how different results are when following these other approaches and to verify if the main findings are still valid.

## 2.1 Summary statistics

Descriptive statistics on the variables used in the analysis are presented in Table 1. Slightly more than half of the sample consists of females representing 53% of the married subsample and 64% of the divorced subsample. 55% of the individuals live in urban areas, and not surprisingly, less than 19% belong to an ethnic group. Only 51% are employed (consistent with most of the females not reporting earnings as will be shown below). In addition, 50% of the married subsample consists of people with more than 20 years of marriage and people with 5 or less years of marriage duration represent the highest share in the divorced subsample (37%). Around 17% of the individuals have been affected by the reform, and the birth cohort of people born between 1929 and 1948 has the lowest representation in the sample (19%).<sup>4</sup> Finally, as it can be observed, 8% are divorced individuals.

Table 2 presents the average years of schooling, age at marriage, and number of children, for married and divorced people. The differences between these two subsamples are not very large, but on average divorced individuals are higher educated, go into marriage younger and have more children.

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<sup>4</sup> People born before 1929 and after 1988 were excluded from the sample due to the scarce number of observations available in each of these years.

Table 1. Descriptive statistics

Description	Overall sample	Married	Divorced
	%	%	%
Females	54.6	53.7	64.6
Urban Strata	55.7	54.5	68.3
Ethnic group	18.8	19.3	13.0
Employed	51.6	51.0	57.8
0-5 years of marriage duration	13.9	11.8	37.3
6-10 years of marriage duration	11.5	11.0	17.7
11-15 years of marriage duration	11.1	10.6	16.2
16-20 years of marriage duration	11.8	11.7	11.8
More than 20 years of marriage duration	51.5	54.7	16.8
Affected by the reform	17.1	17.7	11.3
Birth cohort 1929-1948	19.2	19.2	19.3
Birth cohort 1949-1968	41.0	40.5	46.7
Birth cohort 1969-1988	39.7	40.2	33.8
<b>Total of observations</b>	<b>12 501</b>	<b>11 458</b>	<b>1 043</b>
		<b>(91.7%)</b>	<b>(8.3%)</b>

Source: Mexican Family Life Survey (MxFLS).

Table 2. Descriptive statistics – Mean and standard deviation values

Description	Overall sample		Married		Divorced	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Years of schooling	6.6	3.6	6.5	3.6	6.8	3.6
Age at marriage	21.7	5.6	21.8	5.6	20.7	5.4
Number of children	3.4	2.6	3.3	2.6	3.7	2.7

Source: Mexican Family Life Survey (MxFLS).

According to the MxFLS fieldwork protocols the individuals who answered the marital history section in the MxFLS first round did not have to re-answer it in the second and third rounds. They only had to update this information if they changed their marital status. Therefore, the

above statistics are based on information provided in the three rounds.<sup>5</sup> In addition, it is important to mention the information for an individual has been completed using the data provided during the three rounds. For instance, if an individual reported a divorced marital status in round one but the years of education are not available, then, round two and three are used to obtain the level of education for this person if reported in any of them.

Two additional factors are considered important when analysing marital decisions, earnings and the years of schooling not only of the individual under analysis, but also the level of education of the other person involved in the relationship. Table 3 presents the number of observations reporting missing values in the variable earnings for each round.<sup>6</sup> Earnings are not reported for a large proportion of observations.<sup>7</sup> For instance, in the second round, 83% of all married women have missing data given their low participation in the labour market. Regarding the inclusion in the model of the years of schooling of the other person involved in the relationship, the issue is again related to the non-response levels. 27% of the divorced population did not provide information about the years of schooling of their ex-husbands or ex-wives. Techniques to impute omitted values or indicator variables could be created to control for not reported values. However, given the high percentage of missing information these options are left out and it has been decided not to consider these two variables in the study rather than include them.

Table 3. Earnings – Missing values

Round	Married				Divorced/Separated			
	Females		Males		Females		Males	
	Total	%	Total	%	Total	%	Total	%
First round	5 041	81.8	1 942	36.6	411	60.9	126	34.1
Second round	5 162	83.8	2 018	38.0	449	66.6	159	43.0
Third round	5 191	84.2	2 562	48.3	479	71.0	196	53.1

Source: Mexican Family Life Survey (MxFLS).

<sup>5</sup> The final dataset includes all those who turned to divorce or separated in the second and third rounds as well.

<sup>6</sup> The variable considered is the income reported in the last twelve months.

<sup>7</sup> There are two reasons for these missing values, the person does not work or the person is working but did not report the information.

## 2.2 Sample selection bias and extent of results

An issue that needs to be considered is the potential sample selection bias in the nature of the analysis being conducted. The dataset only includes people married, divorced and separated, and it is likely that those individuals who were affected by the reform and are married, divorced or separated at the time of the survey, are also those with lower levels of educational attainment.<sup>8</sup>

However, the selection bias present in the sample is offset by another important dataset feature. The 1993 change in the law, encourages students that previously would have not attended or completed secondary education to stay in school until they finish, but it has no effect on those individuals who initially were determined to pursue higher levels of education. Clark and Royer (2013) show that these reforms generate only weak spillovers to higher levels of educational attainment.

On the basis of the foregoing, all those persons with more than 12 years of education are excluded from the sample. Two main implications should be highlighted:

- 1) Not to consider the group of individuals above 12 years of education contributes to reduce the potential selection bias mentioned earlier. The higher the level of education, the less likely to be married, divorced or separated if affected by the change in the compulsory years of schooling.
- 2) The analysis is centred only on the effect of education on marital disruption for the group of people with no more than 12 years of schooling. Although the 2010 Census indicates that 82.6% of the Mexican population has as a maximum 12 years of education and 61.1% of the divorced population in 2010 are also in this group (up to 12 years of education), the findings in this analysis should carefully not be extended to the entire Mexican population.

## 3 Estimation strategy

### 3.1 Identification strategy

To identify the causal effect of education on marital dissolution the following equations are estimated:

$$Ds_i = \beta_{Ed}Ed_i + \beta_{Am}Am_i + \beta_{Ch}Ch_i + \beta_{Es}Es_i + \beta_{Ar}Ar_i + \beta_{Et}Et_i + \beta_{Md}Md_i + \beta_{Bc}Bc_i + \beta_{Gn}Gn_i + v_i \quad (1)$$

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<sup>8</sup> All those who were born in 1979 were the first generation affected by the compulsory schooling change, as they were finishing 8<sup>th</sup> grade and starting 9<sup>th</sup> grade in 1993.

$$Ed_i = \beta_{In}In_i + \beta_{Am}Am_i + \beta_{Ch}Ch_i + \beta_{Es}Es_i + \beta_{Ar}Ar_i + \beta_{Et}Et_i + \beta_{Md}Md_i + \beta_{Bc}Bc_i + \beta_{Gn}Gn_i + \varepsilon_i \quad (2)$$

where  $Ds$  is a binary indicator for marital status (divorced/separated = 1),  $Ed$  are the years of schooling,  $Am$  is the age at marriage,  $Ch$  is the number of children,  $Es$  is the employment status (employed = 1), and  $Ar$ ,  $Et$ ,  $Md$ ,  $Bc$ ,  $Gn$ , and  $In$ , are indicator variables for area where the individual lives (urban area = 1), ethnic group (belongs to an ethnic group = 1), marriage duration (0-5 years = 1, 6-10 years = 2, 11-15 years = 3, 16-20 years = 4, more than 20 years = 5), birth cohort (born between 1929-1948 = 1, born between 1949-1968 = 2 and born between 1969-1988 = 3), gender (woman = 1), and instrument (affected by the change in the law = 1), respectively. Specification (1) is based on Becker et al. (1977) but it has been adapted for the Mexican case and according to the information available. It also represents the probit model to be estimated in the first part of the analysis. In Becker's model, two regressions were estimated separately, one for men and another for women. In this case due to sample size, it has been decided to estimate on the pooled sample and to control for gender instead.

The dependent variable in the analysis is dichotomous and the endogenous regressor is continuous, then, the maximum likelihood estimation using an IV probit model is the preferred approach to follow. This procedure is adopted over the two-stage least squares (2SLS) regression analysis, because maximum likelihood makes stronger specification assumptions, being more efficient than other estimators. In addition, it allows to predict outcomes between 0 and 1, while in 2SLS there is nothing to bind the value to the [0-1] range (Lewbel et al. 2012).

### 3.2 Validity of the instrument

Table 4 shows the enrolled students and potential students in secondary school during the period 1988-1998. In the academic years previous to the change in the law, a percentage decrease is observed in the ratio enrolled/potential students in 1989-1990 and 1990-1991, and a slight increase is registered in 1991-1992 and 1992-1993. However, in the academic year directly affected by the reform, 1993-1994, and the two subsequent academic years, this ratio shows higher percentage increases. To the best of my knowledge, there were no other modifications that would have affected the educational attainment around the reform date, considering this a positive indicator about the validity of the instrument.

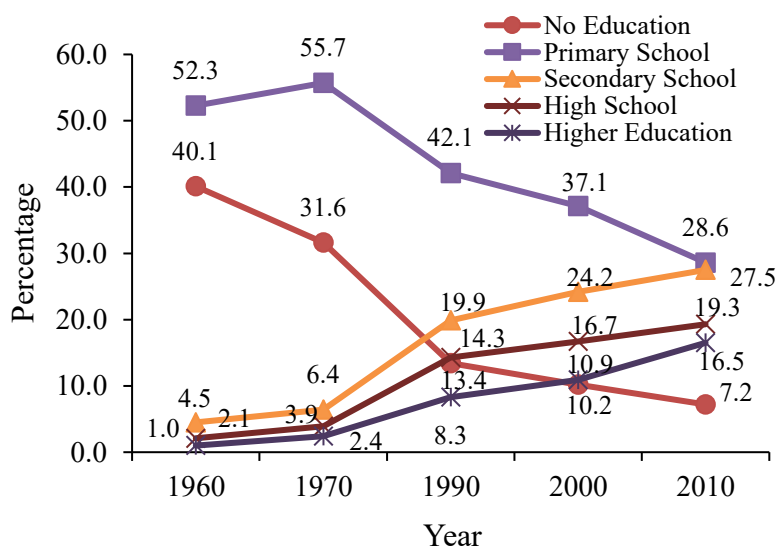
The highest attained level of education has increased considerably in Mexico. Figure 1 shows for 1960, 1970, 1990, 2000 and 2010, the percentage of the population aged 15 and older by level of education. As it can be observed, the percentage of population with no education and only primary education has steeply decreased over time from 40.1% and 52.3% in 1960,

Table 4. Enrolled and potential students – Secondary school

Academic year	Enrolled students	Potential students	% (Enrolled / Potential)	% increase
1988-1989	4 355 334	7 438 743	58.5	
1989-1990	4 267 156	7 410 859	57.5	-0.9
1990-1991	4 190 190	7 354 602	56.9	-0.6
1991-1992	4 160 692	7 286 822	57.1	0.1
1992-1993	4 203 098	7 221 894	58.2	1.1
1993-1994	4 341 924	7 169 977	60.5	2.3
1994-1995	4 493 173	7 135 485	62.9	2.4
1995-1996	4 687 335	7 118 062	65.8	2.8
1996-1997	4 809 266	7 115 739	67.5	1.7
1997-1998	4 929 301	7 127 587	69.1	1.5

Source: Enrolled students: Secretariat of Public Education. Educational statistics. Historical statistics. Potential students: Author's elaboration based on World Bank data. World Development Indicators. Population, total and Birth rate, crude (per 1 000 people). <http://data.worldbank.org/indicator/SP.POP.TOTL?locations=MX>  
<http://data.worldbank.org/indicator/SP.DYN.CBRT.IN?locations=MX>

Figure 1. Percentage of population aged 15 and older -Level of education-



Source: National Institute of Statistics and Geography (INEGI). For some years percentages do not add up to 100% due to the non-specified category.

respectively, to 7.2% and 28.6% in 2010, respectively. On the other hand, higher percentages for people with secondary school, high school and higher education, have been gradually reached. In 1970 only 6.4% of Mexicans attended secondary school, while in 1990 this percentage tripled.

The instrument proposed tries to capture the causal effect by the exogenous variation induced by the 1993 reform, then, the existing positive trend in the levels of education has to be addressed in the analysis. Failure to account for it would generate biased estimations, because the growing tendency in the years of education would be incorrectly attributed to the instrument. To control for the positive trend in the years of education, individuals are grouped in three birth cohort groups, 1929-1948, 1949-1968 and 1979-1998. This also provides the opportunity to control for other possible intergenerational changes such as different attitudes towards divorce for example.

## 4 Probability of marital dissolution

### 4.1 Empirical results

The marginal effects obtained for the probit specification established in the analysis, when treating schooling as exogenous, are presented in Table 5. Column (1) reports the results for the simplest model, when the age at marriage, the number of children and the employment status are not considered. It could be argued that these three covariates are themselves affected by schooling, representing one of the channels through which education affects marriage dissolution. Therefore columns (2) to (4) show the estimations when adding these variables initially excluded from the model, one at a time. Finally, in column (5) the complete model specified is presented (Equation 1).

The relationship between all the explanatory variables and the probability of marriage dissolution is significant. Moreover, the data indicates that an additional year of schooling is associated with a decrease between 0.006 and 0.009 in the probability of marital dissolution for those with 12 years of education as a maximum<sup>9</sup>, depending on the controls used. This means an extra year of education makes an individual between 0.6 to 0.9 percentage points less likely to get divorced during the 2002-2012 period.

According to column (5), the age at marriage and belonging to an ethnic group reduce the probability of marriage dissolution by 0.01 and 0.02, respectively. Marriage duration also indicates the longer the marriage, the lower the probability of marital breakdown. On the contrary, living in an urban area increases this probability by 0.03. All these four variables present the expected association according to the literature. A variable showing a different path

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<sup>9</sup> All results only apply to this subgroup even if not explicitly mentioned.

is the number of children. Data indicates an additional child increases the probability of marriage dissolution by 0.006. A potential explanation for this to happen in the country, is the restriction in the analysis to the group of people with no more than 12 years of education. Then, an additional child represents higher household expenditure, increasing internal financial family strain and leading to instability within the marriage. Finally, the employment status indicates employed individuals increase by 0.04 their probability of separation. This result should not be considered as conclusive as the others. For this variable a different effect between the subgroups of women and men is expected. The issue will be addressed below, when the gender strategy for the probit estimation is performed.

Table 5. Probit estimates

	Marginal Effects				
	(1)	(2)	(3)	(4)	(5)
Years of schooling	-0.009*** (0.0009)	-0.006*** (0.0009)	-0.007*** (0.0010)	-0.009*** (0.0009)	-0.006*** (0.0009)
Area (urban=1)	0.044*** (0.0058)	0.043*** (0.0054)	0.045*** (0.0057)	0.041*** (0.0057)	0.039*** (0.0053)
Ethnic group	-0.026*** (0.0067)	-0.023*** (0.0061)	-0.027*** (0.0064)	-0.027*** (0.0065)	-0.025*** (0.0058)
Marriage duration					
6-10 years	-0.191*** (0.0254)	-0.215*** (0.0253)	-0.209*** (0.0252)	-0.193*** (0.0255)	-0.224*** (0.0250)
11-15 years	-0.310*** (0.0264)	-0.356*** (0.0267)	-0.341*** (0.0260)	-0.317*** (0.0264)	-0.382*** (0.0266)
16-20 years	-0.483*** (0.0237)	-0.636*** (0.0254)	-0.517*** (0.0234)	-0.484*** (0.0238)	-0.655*** (0.0248)
More than 20 years	-0.585*** (0.0193)	-0.741*** (0.0186)	-0.616*** (0.0193)	-0.583*** (0.0196)	-0.754*** (0.0185)
Age at marriage		-0.011*** (0.0006)			-0.010*** (0.0006)
Number of children			0.010*** (0.0011)		0.006*** (0.0010)
Emp. Status (emp=1)				0.050*** (0.0070)	0.047*** (0.0066)
Total of observations	8 468	8 468	8 468	8 468	8 468

Source: Mexican Family Life Survey (MxFLS). Robust standard errors in parentheses. Marginal effects at sample means. All regressions include a constant term and gender and birth cohort control dummies. Marriage duration categorical base: 0-5 years of marriage. \*\*\*Statistically significant at the 99% confidence level. \*\*Statistically significant at the 95% confidence level.

It could be argued the effect of education on marital dissolution seems to be relatively small versus other variables in the model such as marriage duration. However, given divorce rates early-on in marriages are higher and later-on lower, the larger effect of the variable marriage duration is reasonable. In addition, considering only 8.3% of the dataset are divorced individuals and the impact of an additional year of schooling is the same magnitude as an additional child (but opposite in direction), the marginal effect obtained for the years of schooling should not be minimized at this stage. For instance, completion of secondary school (9 years of education) decreases in 1.8 percentage points the probability of marital dissolution compared to completion of primary school (6 years of education).

The results for the complete model are in line with those reported in columns (1) to (4) for all the variables. In particular for education, a stronger negative effect on marital dissolution (0.009) is observed at first but it is reduced when age at marriage and number of children are incorporated into the model.

#### **4.2 Probability of marital dissolution – Average schooling**

As previously mentioned, to define an appropriate strategy to identify the impact education has on the probability of marital dissolution and to deal with a potential distortion generated from duplicated observations for a household, the decision taken was to use the record of the individual in the household with the highest level of education. Thus, if the wife had 8 years of education but the husband had 9 years, the information of the latter was used. The results obtained from this approach were presented in the previous section 4.1. The main purpose of this section is to compare the results when a different strategy is followed, when the average level of education for married couples is used. It is important to include these results and to verify if the effect of schooling on the probability of marriage dissolution is still negative when the approach is modified. Table 6 provides the marginal effects for the five different specifications discussed earlier.

A negative and significant impact on the probability of marital dissolution is reported for an additional year of schooling. As it can be expected, when using the average education of the household (rather than the highest level) the impact of schooling on the probability of marriage dissolution is smaller. Column (5) in Table 6 indicates an extra year of education reduces by 0.2 percentage points the probability of marriage dissolution. The rest of the variables present a similar behavior. This evidence supports the conclusions obtained through the main approach established in the first part of the analysis. It also contributes to dispel the argument that the inclusion in the dataset of the highest educated individuals is the real driving force for the findings in this study.

Table 6. Probit estimates – Average schooling

	Marginal Effects				
	(1)	(2)	(3)	(4)	(5)
Years of schooling	-0.005*** (0.0010)	-0.003*** (0.0010)	-0.003*** (0.0010)	-0.005*** (0.0010)	-0.002*** (0.0010)
Area (urban=1)	0.041*** (0.0059)	0.040*** (0.0055)	0.042*** (0.0058)	0.038*** (0.0059)	0.037*** (0.0054)
Ethnic group	-0.022*** (0.0070)	-0.020*** (0.0064)	-0.023*** (0.0068)	-0.023*** (0.0069)	-0.022*** (0.0061)
Marriage duration					
6-10 years	-0.188*** (0.0252)	-0.212*** (0.0252)	-0.207*** (0.0251)	-0.190*** (0.0253)	-0.223*** (0.0249)
11-15 years	-0.306*** (0.0264)	-0.351*** (0.0268)	-0.339*** (0.0260)	-0.313*** (0.0264)	-0.380*** (0.0266)
16-20 years	-0.483*** (0.0236)	-0.637*** (0.0253)	-0.518*** (0.0233)	-0.484*** (0.0236)	-0.657*** (0.0247)
More than 20 years	-0.582*** (0.0193)	-0.739*** (0.0187)	-0.615*** (0.0192)	-0.581*** (0.0195)	-0.753*** (0.0185)
Age at marriage		-0.011*** (0.0006)			-0.010*** (0.0006)
Number of children			0.012*** (0.0011)		0.007*** (0.0011)
Emp. Status (emp=1)				0.048*** (0.0072)	0.046*** (0.0067)
Total of observations	8 468	8 468	8 468	8 468	8 468

Source: Mexican Family Life Survey (MxFLS). Robust standard errors in parentheses. Marginal effects at sample means. All regressions include a constant term and gender and birth cohort control dummies. Marriage duration categorical base: 0-5 years of marriage. \*\*\*Statistically significant at the 99% confidence level. \*\*Statistically significant at the 95% confidence level.

#### 4.3 Probability of marital dissolution – Only women and only men

Typically, empirical studies based on marriage decisions are conducted splitting the dataset by gender. Then, conclusions obtained for the women subgroup are compared with the men subgroup. Due to the lack of surveys in Mexico including variables such as the age of marriage and the number of children for men, not much work has been devoted to study this topic. The information provided by the MxFLS survey offers an opportunity to analyse marriage dissolution decisions but splitting the dataset for females and males is not considered the best strategy to follow in here. The change in compulsory years of education was implemented in 1993. If the only women/only men approach is followed, the number of people divorced and separated affected by this change is considerably reduced within each subset.

Table 7. Probit estimates – Only women

	Marginal Effects				
	(1)	(2)	(3)	(4)	(5)
Years of schooling	-0.003*** (0.0008)	-0.001 (0.0008)	-0.001** (0.0009)	-0.003*** (0.0008)	-0.001** (0.0008)
Area (urban=1)	0.030*** (0.0055)	0.030*** (0.0050)	0.032*** (0.0055)	0.023*** (0.0053)	0.024*** (0.0048)
Ethnic group	-0.017*** (0.0065)	-0.016*** (0.0056)	-0.018*** (0.0063)	-0.019*** (0.0060)	-0.018*** (0.0050)
Marriage duration					
6-10 years	-0.220*** (0.0293)	-0.258*** (0.0299)	-0.233*** (0.0294)	-0.227*** (0.0298)	-0.272*** (0.0303)
11-15 years	-0.338*** (0.0309)	-0.384*** (0.0318)	-0.359*** (0.0310)	-0.352*** (0.0310)	-0.416*** (0.0321)
16-20 years	-0.495*** (0.0276)	-0.661*** (0.0309)	-0.520*** (0.0279)	-0.498*** (0.0276)	-0.681*** (0.0298)
More than 20 years	-0.576*** (0.0236)	-0.752*** (0.0237)	-0.604*** (0.0242)	-0.570*** (0.0242)	-0.762*** (0.0239)
Age at marriage		-0.009*** (0.0006)			-0.008*** (0.0005)
Number of children			0.006*** (0.0011)		0.002*** (0.0009)
Emp. Status (emp=1)				0.071*** (0.0084)	0.066*** (0.0079)
Total of observations	6 833	6 833	6 833	6 833	6 833

Source: Mexican Family Life Survey (MxFLS). Robust standard errors in parentheses. Marginal effects at sample means. All regressions include a constant term and birth cohort control dummies. Marriage duration categorical base: 0-5 years of marriage. \*\*\*Statistically significant at the 99% confidence level. \*\*Statistically significant at the 95% confidence level.

The limitation in the number of observations to conduct the analysis following the gender strategy restricts the IV methodology but not the probit estimation. Therefore, in this subsection, results are provided when the probit analysis is conducted by gender. The reader is asked to bear in mind these results are presented only as complementary information as they are not considered in the second part of the analysis, the causality approach.

Tables 7 and 8 present the marginal effects for the only women and only men subsamples, respectively. The variable years of schooling continues to exhibit a negative effect for both the female and male subsamples, but it is only consistently significant for women. The results reported when the years of schooling are significant for both women and men (columns [1] and columns [4]) in Tables 7 and 8) indicate an additional year of education decreases by 0.003 the probability of marital dissolution for women, while it only reduces in 0.001 the probability of marital dissolution for men. This finding highlights an important implication: In terms of marital stability, the level of education the wife brings into the marriage plays a more relevant role than the husband's level of education. Another notable finding is that an additional child

increases only by 0.2 percentage points the probability of marital disruption for women but it increases by 0.7 percentage points the probability for men (column [5] in Tables 7 and 8). As mentioned earlier, more children in the household represent higher financial strain. However, after marriage dissolution, women are far more likely to stay with the children living in the family home than men. As the number of children in the marriage increases, men are more likely than women to change their lifestyle after a marital breakdown. This is an important result against the strategy commonly followed in other studies where the number of children is not considered when the marital decisions of men are modelled. Finally (and perhaps the most striking finding in this subsection), the variable employment status shows a positive impact for women and a negative effect for men. This variable is the only with opposite signs when splitting the dataset by gender, suggesting that employed females

Table 8. Probit estimates – Only men

	<b>Marginal Effects</b>				
	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>
Years of schooling	-0.001** (0.0007)	-0.001** (0.0006)	-0.0007 (0.0007)	-0.001** (0.0007)	-0.0006 (0.0005)
Area (urban=1)	0.024*** (0.0047)	0.018*** (0.0039)	0.022*** (0.0043)	0.024*** (0.0047)	0.017*** (0.0036)
Ethnic group	-0.008 (0.0053)	-0.007 (0.0041)	-0.008 (0.0046)	-0.008 (0.0053)	-0.006 (0.0037)
Marriage duration					
6-10 years	-0.151*** (0.0344)	-0.178*** (0.0387)	-0.193*** (0.0360)	-0.150*** (0.0344)	-0.211*** (0.0392)
11-15 years	-0.256*** (0.0339)	-0.357*** (0.0391)	-0.322*** (0.0349)	-0.255*** (0.0339)	-0.428*** (0.0397)
16-20 years	-0.364*** (0.0311)	-0.569*** (0.0359)	-0.424*** (0.0326)	-0.363*** (0.0311)	-0.625*** (0.0365)
More than 20 years	-0.419*** (0.0280)	-0.620*** (0.0313)	-0.466*** (0.0302)	-0.417*** (0.0280)	-0.666*** (0.0324)
Age at marriage		-0.005*** (0.0005)			-0.004*** (0.0005)
Number of children			0.010*** (0.0010)		0.007*** (0.0009)
Emp. Status (emp=1)				-0.011 (0.0069)	-0.012** (0.0058)
Total of observations	5 668	5 668	5 668	5 668	5 668

Source: Mexican Family Life Survey (MxFLS). Robust standard errors in parentheses. Marginal effects at sample means. All regressions include a constant term and birth cohort control dummies. Marriage duration categorical base: 0-5 years of marriage. \*\*\*Statistically significant at the 99% confidence level. \*\*Statistically significant at the 95% confidence level.

and unemployed males are more likely to be divorced, for the particular subgroup of people with no more than 12 years of education. Taken together, these two results might be a potential indicator that production complementarities within the household (Becker 1993) are important in Mexico, with more stable marriages with working husbands and non-working wives.

## 5 The causal effect of education on the probability of marital dissolution

To identify not only the correlation between education and marital disruption but its causal effect, the use of the 1993 change in the length of compulsory education in Mexico is incorporated in the analysis as an instrument for education. The IV probit estimates (Equation 1 and Equation 2) using identical models to the earlier probit specifications are presented in Table 9 and Table 10.

The Wald-test indicates the null hypothesis of no endogeneity is rejected and the use of an instrument for the years of schooling is an appropriate decision. This test assesses whether the error terms in Equation (1) and Equation (2) are correlated. If the test is not significant, the null hypothesis cannot be rejected and a probit regression would be considered the right strategy to estimate the effect of education on marital dissolution (Wooldridge 2010).

Table 9. IV probit estimates

	Marginal Effects				
	(1)	(2)	(3)	(4)	(5)
Years of schooling	-0.008* (0.0053)	-0.005* (0.0031)	-0.007 (0.0078)	-0.009* (0.0050)	-0.005 (0.0040)
Area (urban=1)	0.042** (0.0172)	0.040*** (0.0123)	0.043 (0.0302)	0.039*** (0.0153)	0.037** (0.0153)
Ethnic group	-0.022* (0.0120)	-0.017** (0.0084)	-0.023 (0.0194)	-0.023** (0.0117)	-0.018* (0.0103)
Marriage duration					
6-10 years	-0.277*** (0.0730)	-0.276*** (0.0261)	-0.287** (0.134)	-0.277*** (0.0662)	-0.279*** (0.0285)
11-15 years	-0.462*** (0.107)	-0.599*** (0.0609)	-0.482** (0.206)	-0.463*** (0.0957)	-0.604*** (0.0842)
16-20 years	-0.603*** (0.105)	-0.851*** (0.0648)	-0.625*** (0.201)	-0.600*** (0.0925)	-0.853*** (0.0892)
More than 20 years	-0.685*** (0.0555)	-0.922*** (0.0338)	-0.707*** (0.108)	-0.681*** (0.0490)	-0.922*** (0.0468)
Age at marriage		-0.014*** (0.0036)			-0.013*** (0.0048)
Number of children			0.009* (0.0054)		0.003** (0.0015)
Emp. Status (emp=1)				0.044***	0.039***

	Marginal Effects				
	(1)	(2)	(3)	(4)	(5)
				(0.0152)	(0.0153)
Total of observations	8 468	8 468	8 468	8 468	8 468
Wald test of exogeneity	96.07	260.88	42.18	106.81	171.0
Prob > chi	0.0000	0.0000	0.0000	0.0000	0.0000
First-stage coefficient instrument	0.391*** (0.104)	0.693*** (0.107)	0.207** (0.103)	0.439*** (0.104)	0.492*** (0.106)
F-test for instrument	14.0895	41.994	4.06411	17.8264	21.4003
Prob > F	0.0002	0.0000	0.0438	0.0000	0.0000

Source: Mexican Family Life Survey (MxFLS). Robust standard errors in parentheses. Marginal effects at sample means. All regressions include a constant term and gender and birth cohort control dummies. Marriage duration categorical base: 0-5 years of marriage. \*\*\*Statistically significant at the 99% confidence level. \*\*Statistically significant at the 95% confidence level. \*Statistically significant at the 90% confidence level.

A further important question: Is the change in compulsory education in Mexico a valid instrument for the years of schooling? As the first stage of the model specification is linear, the approach followed is to estimate its linear version and compare it to the F-statistic for instrument weakness with the rule of thumb indicated by Staiger and Stock (1997). According to this rule, the F-statistic should be greater than 10 to rule out weak identification. The values obtained in the simplest model (column [1]) and the complete model (column [5]) are 14.0 and 21.4 in Table 9; and 11.6 and 14.8, in Table 10; indicating the instrument can be considered relevant.

The estimates in columns (1) to (5) do not show an additional year of schooling reduces the probability of marital dissolution at standard confidence levels. A casual effect is not observed. All the other results are consistent with the findings observed in sections 4.1 and 4.2. The only exception is the variable ethnic group which is not statistically significant in the complete model (column [5] in Tables 9 and 10).

As discussed earlier, the use of the IV technique obtains consistent estimators that traditional methodologies fail to account for. In this particular case, the probit model suggests an additional year of schooling is associated with a decrease between 0.6 and 0.9 percentage points in the probability of marital dissolution. However, when considering endogeneity, the effect of education is not statistically significant on the probability of marital breakdown. Comparing the values obtained for the probit and the IV probit coefficients for education, it is observed the probit estimators are downward-bias.

Table 10. IV probit estimates – Average schooling

	<b>Marginal Effects</b>				
	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>
Years of schooling	-0.004 (0.0046)	-0.002 (0.0029)	-0.002 (0.0071)	-0.005 (0.0043)	-0.001 (0.0039)
Area (urban=1)	0.039** (0.0173)	0.037*** (0.0128)	0.040 (0.0328)	0.036** (0.0152)	0.034** (0.0167)
Ethnic group	-0.018 (0.0116)	-0.013 (0.0086)	-0.019 (0.0193)	-0.019* (0.0112)	-0.015 (0.0106)
Marriage duration					
6-10 years	-0.275*** (0.0787)	-0.276*** (0.0267)	-0.287* (0.160)	-0.276*** (0.0697)	-0.279*** (0.0301)
11-15 years	-0.460*** (0.116)	-0.599*** (0.0679)	-0.481* (0.247)	-0.461*** (0.101)	-0.605*** (0.0996)
16-20 years	-0.602*** (0.113)	-0.854*** (0.0720)	-0.627*** (0.239)	-0.600*** (0.0974)	-0.856*** (0.105)
More than 20 years	-0.683*** (0.0597)	-0.922*** (0.0374)	-0.706*** (0.129)	-0.680*** (0.0514)	-0.922*** (0.0549)
Age at marriage		-0.015*** (0.0040)			-0.014** (0.0058)
Number of children			0.010 (0.0072)		0.004** (0.0019)
Emp. Status (emp=1)				0.042*** (0.0154)	0.038** (0.0171)
Total of observations	8 468	8 468	8 468	8 468	8 468
Wald test of exogeneity	84.51	225.32	32.12	96.82	134.97
Prob > chi	0.0000	0.0000	0.0000	0.0000	0.0000
First-stage coefficient instrument	0.353*** (0.104)	0.609*** (0.106)	0.171* (0.102)	0.405*** (0.103)	0.408*** (0.106)
F-test for instrument	11.6187	32.6798	2.78878	15.3298	14.8883
Prob > F	0.0007	0.0000	0.0950	0.0001	0.0001

Source: Mexican Family Life Survey (MxFLS). Robust standard errors in parentheses. Marginal effects at sample means. All regressions include a constant term and gender and birth cohort control dummies. Marriage duration categorical base: 0-5 years of marriage. \*\*\*Statistically significant at the 99% confidence level. \*\*Statistically significant at the 95% confidence level. \*Statistically significant at the 90% confidence level.

## 7 Conclusions

This paper analyses the effect of education on marital dissolution in the context of a Latin American country, Mexico. While there is vast economic literature related to education and marital decisions, analyses have mainly focused on developed economies or European

countries. Studies can be found for Norway, United States, United Kingdom and others, with findings differing across countries and linked to differences in several factors such as the labour market conditions, social policies and strictness of divorce legislation.

Empirical evidence showing the impact of education and other potential divorce determinants on marriage dissolution is non-existent for the Latin American Region. This can be attributed to the lack of surveys with adequate information to fully study the topic, discouraging researchers to work on this field.

In the first part of the analysis, outcomes across all the different specifications are significantly negatively correlated with marriage dissolution. The results using the IV methodology in the second part, indicate the relationship between education and divorce is not causal.

These two findings together let us draw important implications. Is education by itself a driving mechanism increasing marital stability in Mexico? No. Developing economies face substantially lower levels of education attainment, higher dropout rates, poor quality teaching and lack of financial resources (classrooms, materials, technology). All these factors are preventing education to be a stronger catalyst to positively change social norms and conventions surrounding family life and no causal effect from higher levels of education on marriage stability can be established. Does it mean the level of education has nothing to do with better marriage outcomes in Mexico? Education is a worldwide powerful tool to reduce social and economic disadvantages. This work suggests education is undoubtedly capturing the effect of other cognitive and/or cultural mechanisms present. We aim to further stimulate research to continue analysing the mechanisms driving marital decisions in the Latin American region.

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