DEMOGRAPHIC RESEARCH

Descriptive Finding

Disentangling how educational expansion did not increase women's age at union formation in Latin America from 1970 to 2000

Albert Esteve

Luis Ángel López-Ruiz

Jeroen Spijker

Table of Contents

Disentangling how educational expansion did not increase women's age at union formation in Latin America from 1970 to 2000

Albert Esteve[1]

Luis Ángel López-Ruiz[2]

Jeroen Spijker[3]

Abstract

BACKGROUND
One of the most salient features of Latin American marriages over the last few decades is the stable timing of their union formation, despite educational expansion, the postponement of and retreat from marriage, and the increase in non-marital cohabitation.

OBJECTIVE
We examine why educational expansion did not influence the aggregated indicators of women's timing of union formation.

METHODS
We used recently harmonised international census microdata for eight Latin American countries from the 1970s to the 2000s.

RESULTS
The results from a logistic regression analysis show that this apparent stability was produced by contrasting shifts that occurred in various educational groups. In most countries the postponement effect that was expected from educational expansion was offset by earlier union formation (mostly through non-marital cohabitation) among the least educated (and formally largest) groups, whereas highly educated women showed no change.

[1] Universitat Autònoma de Barcelona, Centre d'Estudis Demogràfics, 08193 Bellaterra (Barcelona), Spain. E-mail: aesteve@ced.uab.es.
[2] Universitat Autònoma de Barcelona, Centre d'Estudis Demogràfics, 08193 Bellaterra (Barcelona), Spain. E-mail: llopez@ced.uab.es.
[3] Universitat Autònoma de Barcelona, Centre d'Estudis Demogràfics, 08193 Bellaterra (Barcelona), Spain. E-mail: jspijker@ced.uab.es.

1. Introduction

Age at union formation has remained relatively constant in Latin America over the last few decades in a context of intense educational expansion, booming non-marital cohabitation, and marriage retreat and postponement (Fussell and Palloni 2004; Cerrutti and Binstock 2009; García and Rojas 2002; Castro 2002; Heaton et al. 2002; Mensch et al. 2005; Singh and Samara 1996; United Nations 1990; Weinberger et al. 1989; Westoff 2003; Esteve et al. 2012). Table 1 provides figures to illustrate these trends for women aged 20-29 in eight Latin American countries since 1970. The absolute difference in the age at union formation between the most recent and the oldest census is approximately one year or less in all countries. Since 1970 the proportion of young women with nine or more years of schooling has more than doubled (or even tripled), and the share of cohabitation among all unions showed even greater increases (e.g., from 9.3% to 48.7% among Brazilian women and from 28.3% to 72.7% among Colombian women).

Table 1: **Female Singulate Mean Age at Union (in years), the proportion of women aged 20-29 with at least secondary education, and the proportion of women aged 20-29 in union, by country, in 1970, and the percentage change between 1970-2000**

	Singulate mean age at union (in years)		% with 9 or more years of schooling		% who cohabit or are single parents	
	1970	Change 1970-2000	1970	Change 1970-2000	1970	Change 1970-2000
Argentina	22.6	+0.6	30.8	+ 38.3	15.7	+ 39.2
Brazil	22.9	-0.7	9.7	+ 32.9	9.3	+ 39.4
Chile	22.6	+0.2	31.2	+ 50.5	12.9	+ 30.1
Colombia	21.8	-0.4	16.0	+ 38.2	28.3	+ 44.4
Costa Rica	20.9	+0.4	21.8	+ 23.3	25.5	+ 16.5
Ecuador	20.8	-0.1	19.0	+ 34.4	29.5	+ 13.5
Mexico	21.2	+1.2	9.5	+ 43.2	17.0	+ 11.7
Panama	19.9	+1.1	25.1	+ 39	53.5	+ 8.6

Source: IPUMS-International (Minnesota Population Center 2011).

These trends are puzzling to social scientists who are aware of the classic association between educational attainment and age at union formation. Despite different views on what drives family change, the effect of education on marriage/union timing is commonly agreed on. Both structural and ideational aspects of education predict marriage postponement as education increases, and there is widespread evidence to confirm this claim (Oppenheimer 1988, Mensch et al. 2005; Jejeebhoy 1996; Singh and Samara 1996; United Nations 1990; Westoff 2003). At the individual level, the evidence from Latin America conforms to the fact that women with more years of schooling are more likely to enter into unions at later ages (Heaton et al. 2002); whereas at the population level, young cohorts with higher levels of educational attainment do not enter into unions at later ages compared to older cohorts with less formal education.

In this sense the Latin American experience contrasts sharply with that of Europe and North America, where modernisation in both the public and private spheres has been associated with delays in first marriages/unions and increases in non-marital cohabitation, especially since the 1970s (Oppenheimer 1988; Sobotka and Toulemon 2008; Thornton et al. 2007; van de Kaa 1987). If we accept the premise that formal education delays the timing of first union (marriage and cohabitation), we would expect educational expansion to increase the number of young adults who have never been in a union and cause the average age at union formation to increase. One necessary condition for a postponement of union entry is that the educational gradient of union formation remains positive and constant over time. Conversely, considering marriage patterns to be stable and independent of educational expansion, age at union formation would remain the same despite more people attaining higher levels of education. Finally, the average age at union formation could remain the same, despite educational expansion, if the educational gradient changes over time.

In this paper we aim to disentangle how educational expansion and women's stability in union formation timing co-existed in Latin America from the 1970s to the 2000s, based on the experience of eight countries, representing approximately three-quarters of the region's population. We also examine how this stability is related to the rise of non-marital cohabitation and the decline of marriage during the same period. This is done by using a logistic regression model that is designed to capture (i) the association between years of schooling and women's age at union formation; (ii) whether the association between education and union formation (i.e., educational gradient) has changed over time and whether time trends were similar for all educational groups; and (iii) the interaction between time, years of education, and type of union. The study does not, however, aim to prove causality or to develop a framework to understand marriage timing in Latin America. In addition, the analysis is restricted to women, as both stability and a clear educational gradient in union formation timing is less evident among men (except for the highly educated).

2. Data and method

We used the Integrated Public Use of Microdata Series (IPUMS) international database (Minnesota Population Center 2011). Eight Latin American countries (Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, and Panama) were selected on the basis of the availability of at least two census samples between 1970 and 2000 and comparable available data on union status and education. Because we are interested in union formation patterns we selected only individuals aged 15 to 50. Table 2 describes the data. The use of census data was considered appropriate because it allows the relationship between educational attainment and union formation to be examined for a more extended period of time and a larger number of countries to be compared than other data. Below, we describe the main variables of interest for our study: 'ever married', 'ever in union', 'years of schooling', and control variables.

Table 2:   Sample characteristics and descriptions of the main variables

		Sample density (%)	N after screening	% of total sample	Marital/Union status (%)				Educational attainment (%)				
					Single	Ever married	Cohab.	Single parent	None	1–5	6–8	9–12	13 +
Argentina	1970	2.0	116226	96.3%	32.4	59.2	6.4	2.0	5.8	30.8	39.6	19.3	4.5
	1980	10.0	641071	100.0%	29.8	56.3	10.4	3.6	6.5	26.3	36.8	22.3	8.1
	1991	10.0	1050384	99.3%	29.8	54.3	13.0	2.8	2.1	12.0	36.1	30.1	19.6
	2001	10.0	922006	100.0%	32.9	44.1	17.4	5.7	2.1	6.5	29.8	38.7	22.9
Brazil	1970	5.0	1209325	99.7%	36.4	58.3	4.2	1.0	36.3	49.9	7.1	5.8	0.9
	1980	5.0	1469441	97.2%	33.9	56.9	7.6	1.6	23.3	46.7	14.5	11.8	3.7
	1991	5.8	2194378	98.7%	30.9	54.4	11.8	2.9	14.7	43.4	18.5	17.5	5.9
	2000	6.0	2768519	99.0%	30.1	45.2	18.3	6.4	7.1	35.9	22.0	27.7	7.2
Chile	1970	10.0	218742	99.4%	36.9	56.5	2.7	3.9	7.3	34.4	33.3	21.9	3.1
	1982	10.0	306529	100.0%	37.0	54.4	3.7	4.9	4.2	20.9	28.9	38.4	7.6
	1992	10.0	368235	100.0%	30.4	56.4	6.6	6.5	2.3	13.0	27.1	44.7	13.0
	2002	10.0	419058	100.0%	30.2	50.2	10.6	9.0	2.0	7.5	17.4	47.1	26.1

Table 2:   (Continued)

		Sample density (%)	N after screening	% of total sample	Marital/Union status (%)				Educational attainment (%)				
					Single	Ever married	Cohab.	Single parent	None	1–5	6–8	9–12	13 +
Colombia	1973	10.0	472131	96.5%	37.4	47.4	10.2	5.1	19.0	55.9	13.9	9.9	1.3
	1985	10.0	714704	97.4%	35.6	44.1	16.0	4.3	8.7	45.8	18.6	21.8	5.1
	1993	10.0	875616	97.7%	30.8	39.5	24.9	4.8	6.4	39.5	19.2	35.0	
	2005	10.0	1002812	96.7%	27.5	30.8	33.0	8.7	6.8	34.6	14.4	32.1	12.2
Costa Rica	1973	10.0	43487	100.0%	36.0	49.6	9.3	5.1	9.3	39.3	33.9	12.8	4.8
	1984	10.0	62992	100.0%	32.0	50.2	10.7	7.1	5.1	22.7	38.8	25.4	8.0
	2000	10.0	104758	100.0%	28.3	48.3	16.9	6.5	2.9	13.8	41.6	27.1	14.7
Ecuador	1974	10.0	138908	96.1%	31.5	49.8	15.3	3.5	26.0	34.7	24.6	12.6	2.2
	1982	10.0	172055	90.0%	30.6	48.0	17.3	4.1	16.6	25.4	31.4	20.0	6.7
	1990	10.0	232303	93.2%	31.4	47.4	17.3	3.9	10.0	17.7	31.8	27.9	12.7
	2001	10.0	287797	89.3%	28.9	45.3	21.4	4.4	7.1	15.9	28.6	30.7	17.7
Mexico	1970	1.0	110203	100.0%	30.8	58.0	10.2	1.0	31.1	39.1	22.0	6.1	1.7
	1990	10.0	2100160	98.2%	33.7	55.5	9.1	1.7	12.4	21.2	29.0	30.9	6.4
	2000	10.5	2614070	97.1%	30.2	54.1	13.2	2.5	7.8	19.3	27.8	35.8	9.4
Panama	1970	10.0	33550	99.5%	26.9	37.9	33.5	1.7	16.5	29.5	33.3	16.9	3.8
	1980	10.0	47010	98.3%	29.3	37.0	30.7	3.1	10.6	18.4	33.0	28.9	9.1
	1990	10.0	59855	98.7%	29.3	37.2	30.1	3.4	6.5	12.2	29.5	34.2	17.6
	2000	10.0	74326	99.3%	27.2	36.0	33.5	3.4	5.3	8.2	26.1	37.8	22.6

Source: IPUMS-International (Minnesota Population Center 2011).

2.1 Ever married and ever in union

One limitation of using census data concerns the way 'union status' is measured. Particularly, in the past, only information on marital status was gathered, even though many people never marry but remain in (or change between) consensual unions. To show the increasing role of non-marital cohabitation in the process of union formation over the last three decades, we used two different specifications of our variable of interest: (i) 'ever married': according to the marital status variable, persons declared as married, separated, divorced, or widowed are classified as 'ever married' and single persons including those living in a consensual union as 'never married'*;* (ii) 'ever in union': the ever married, persons in cohabiting unions, and singles with co-residing children are classified as 'ever in union' and the single population not in union with no co-residing children as 'never in union'. The variable 'own children in the household'

was used to identify single individuals who may have been in a consensual union in the past. The explicit assumption here is that those who have children have experienced a relationship (even if short) with someone of the opposite sex. Although this method may erroneously capture a certain percentage of children resulting from sexual intercourse outside of relationships, we accept these possible biases because we would otherwise miss a great number of women who have ever been in a union, given that after the dissolution of a union it cannot be ascertained whether individuals are recorded as single or not. This approach has previously been suggested and tested by Esteve et al. (2011) and Ruiz and Rodríguez (2011) against other sources that used more direct questions on consensual unions in which similar results were obtained. The proportions according to the different union statuses are summarised in Table 2.

2.2 Years of schooling and control variables

Our second variable of interest is the respondents' level of educational attainment in terms of years of schooling (the IPUMS-International variable YRSCHL), which we grouped into the categories 'none', '1–5 years', '6–8 years', '9–12 years' and '13+ years' of completed education. This scheme follows the United Nations' recommendation of six years of primary, three years of lower secondary, three years of upper secondary, and university/tertiary-level education, which is also typical in Latin America. Sample proportions are provided in Table 2.

The analysis also includes several control variables: single age (between 15 and 50), time (taken as a function of the census year, with 1970 being equal to zero), and country as a fixed effect. Countries were not analysed separately because results showed similar concurrent trends in educational expansion and average age at union formation, despite differences in absolute levels (results available on request).
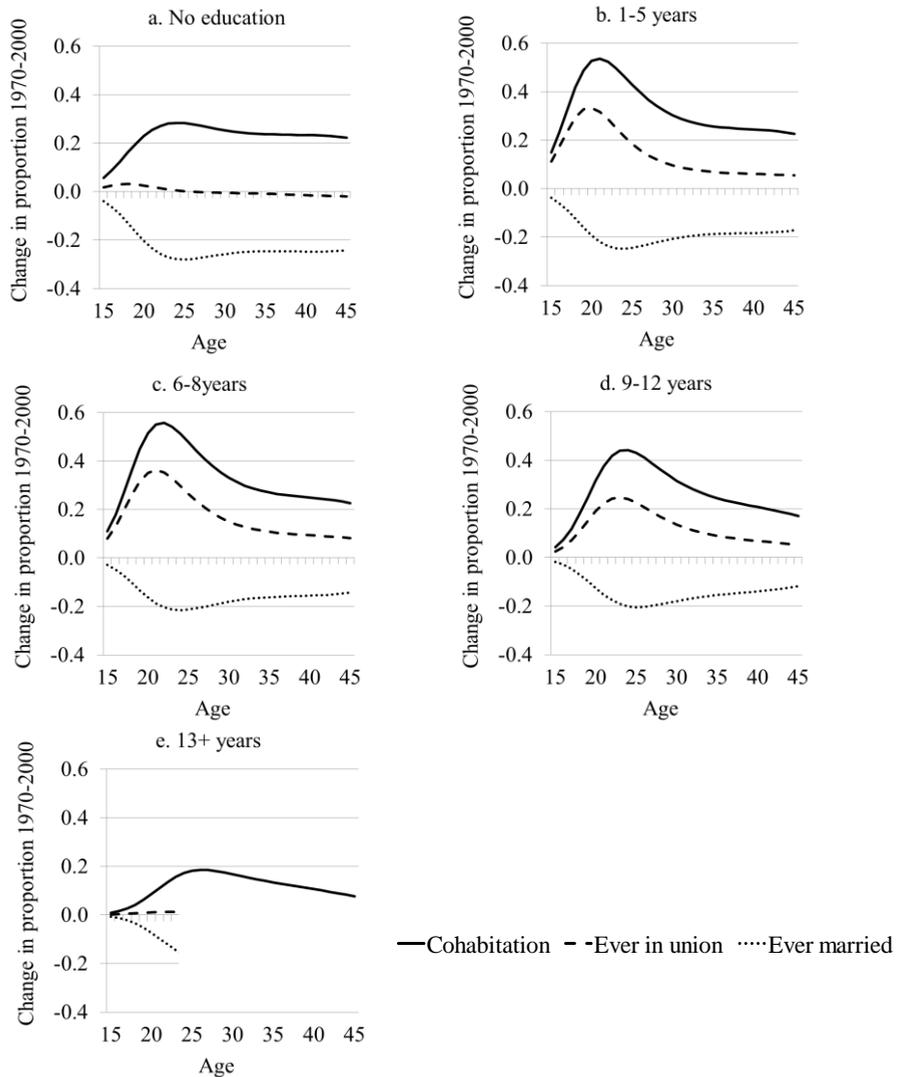
3. Results

We adjusted two models to predict the probability of ever married (Model 1) and ever in union (Model 2) as a function of age, time, years of schooling, and country. Both models include interactions between age and years of schooling and time and years of schooling. The models also control for country fixed effects (details available upon request). Given the complexity of the models, in Figure 1 we present the changing proportions of age, sex, and years of schooling among those in both types of union between 1970 and 2000. Figure 1 portrays the change during this period in the estimated probabilities of ever married and ever in union by age, sex, and years of

schooling categories. Argentina is taken as the reference country, although similar results were found for the other countries under the model specifications. In addition, an estimate of the change in ever in cohabitation is provided (i.e., change in ever in union minus change in ever married). Negative values indicate that the proportion of a given dimension (i.e., ever married, ever in cohabitation, ever in union) in 2000 was lower than in 1970, and positive values indicate that proportions are higher. The lack of difference in the proportion of women ever in union, regardless of the change in marriage or cohabitation, indicates the lack of change in the timing of union formation. Negative values indicate a sign of postponement, whereas positive values indicate a sign of acceleration.

The data show that of the five years-of-school categories, the proportion of women ever in union remains constant only among those with no education and those with at least 13 years of education. In these cases the decrease in marriage is completely offset by a similar increase in the proportion of cohabiting couples. In the intermediate categories, which comprise the bulk of the population and where most of the educational expansion occurred, the share of women in union at young ages increased over time. This trend indicates that women with similar levels of schooling are entering into union at younger ages compared with previous cohorts, primarily through cohabitation. The rise in the proportion of cohabiting women is larger than the decrease in the ever married.

One way to establish a better comprehension of the age-specific changes over time and across educational groups is to observe the changes in the predicted Singulated Mean Age at Union (SMAU). These were calculated from the estimated probabilities derived from the Model 2 coefficients. Table 3 provides the results for the changes between 1970 and 2000. It shows that uneducated women entered into a union 0.3 to 0.5 years earlier in 2000 than in 1970, but women with 1−5, 6−8, and 9−12 years of schooling two to three years earlier, while the most educated observed no change in SMAU.

Figure 1: **Estimated difference between 1970 and 2000 in the proportion of females ever in union, ever married, and currently cohabiting, by age and years of schooling. Argentina 1970–2000**

Data source: IPUMS-International (Minnesota Population Center, 2011). Note: Argentina was used as reference. However, any other country from the sample would have resulted in the same trend (only the absolute level would vary).

Table 3: **Predicted time change in female SMAU as a function of years of schooling between 1970 and 2000**

	Years of schooling					
	None (ref.)	1–5	6–8	9–12	13 +	Overall
Argentina	-0.40	-2.18	-2.65	-2.13	-0.04	**0.64**
Brazil	-0.47	-2.32	-2.82	-2.25	-0.03	**-0.77**
Chile	-0.41	-2.20	-2.68	-2.15	-0.04	**0.11**
Colombia	-0.44	-2.26	-2.75	-2.20	-0.03	**-0.37**
Costa Rica	-0.38	-2.13	-2.60	-2.09	-0.04	**0.41**
Ecuador	-0.35	-2.06	-2.52	-2.03	-0.05	**-0.03**
Mexico	-0.39	-2.16	-2.63	-2.11	-0.04	**1.21**
Panama	-0.31	-1.93	-2.38	-1.92	-0.06	**1.15**

Source: IPUMS-International (Minnesota Population Center 2011).

4. Summary and discussion

In this paper we have investigated the relationship for women between years of schooling and the timing of first unions in eight Latin American countries from 1970 to 2000, in the context of educational expansion, declining marriage rates, and increasing non-marital cohabitation. To this end we used census data from the IPUMS international database. Our research was motivated by the apparent contradiction between the remarkable stability in age at union formation in Latin America during this period and the steady increase in time that younger generations spend at school.

Our analysis demonstrates that this apparent lack of change (or at most, a slight increase) at the population level is attributable to several contrasting trends, as the expected effects of educational expansion were offset by the younger age at union formation. This observation also implies that the relationship between education and first-union formation changed over time. Compositional changes in the education structure were offset by early in union formation in all educational strata to keep the age-specific proportions of ever in union constant over time.

The aforementioned education-specific declines in the age at union entry have occurred in a context of declining marriage rates and increasing cohabitation (and to a much lesser extent, increasing single parenthood), causing the proportion of ever in union women to hardly increase, and in Brazil and Colombia even to decrease. An important additional result was that the marriage decline and an almost equal increase in cohabitation were not comparable across ages. The progressive substitution of

marriage by cohabitation between generations in the studied period was observed to be associated with a downward trend in women's age at union formation, because marriage is being postponed and/or replaced by cohabitation at earlier ages.

The education-specific patterns described herein can be extrapolated to all of the Latin American countries represented in the study. This suggests that the mechanisms behind the known association between education and union formation timing are similar across countries. This finding justified our approach of not running separate models for each country, despite the cultural and historical differences.

Our research shows that educational gradients are dynamic and that the relationship that is observed at the individual level at one point in time may not correspond with the effects at the population level over time. In other words, societal trends do not necessarily move in the same direction as individual gradients. The history of the timing of union formation in Latin America reveals that although more years of schooling supposedly delays union formation, more recent population cohorts with more years of schooling do not enter into unions later than earlier cohorts. This result raises new questions and research interests about why women with certain levels of education enter into unions at earlier ages than others, suggesting an increasing polarisation of Latin American societies that could also have contributed to the image of stability (Rosero-Bixby et al. 2009, Solís and Puga 2009, Cerrutti and Binstock 2009). We hypothesize that later cohorts of young women may have increasingly completed primary and secondary education, but essentially belong to the same social classes as their less educated parents who are about 20 to 30 years older. Thus it is important to reassess the relative meaning of education and being in union in changing societies. The educational expansion in Latin America involved ages at which schooling did not run into conflict with union formation, given that early marriage in Latin America is not as prevalent as in other areas of the world (e.g., Sub-Saharan Africa or India). In addition, the generalization of cohabitation and pre-marital sex, and the fact that higher education may not guarantee stable employment in a context of high unemployment and economic uncertainty, may have paved the way for earlier unions, but often relying on family support (Fussell and Palloni 2004, Mier and Terán 2009). Future research should therefore investigate if the observed decline in the age at union entry for cohabiting unions can also be verified for related processes and transitions, including age at first sexual intercourse, independent living, or childbearing. With all of these results in mind, a comprehensive theory of marriage timing in Latin America should be developed.

References

Cerrutti, M. and Binstock, G. (2009). Familias latinoamericanas en transformación: desafíos y demandas para la acción pública. Santiago de Chile: Naciones Unidas (CEPAL Serie Políticas Sociales, 147).

Castro, T. (2002). Consensual unions in Latin America: Persistence of a dual nuptiality system. *Journal of Comparative Family Studies* 33(1): 35.

Esteve, A., Garcia, J. and McCaa, R. (2011). La enumeración de la soltería femenina en los censos de población: sesgo y propuesta de corrección [The enumeration of unmarried women in population censuses: biases and proposed corrections]. *Papeles de Población* 16(66): 9-40.

Esteve, A., Lesthaeghe, R. and López-Gay, A. (2012). The Latin American Cohabitation Boom, 1970-2007. *Population and Development Review* 38(1): 55-82. doi:10.1111/j.1728-4457.2012.00472.x.

Fussell, E. and Palloni, A. (2004). Persistent marriage regimes in changing times. *Journal of Marriage and Family* 66(5):1201-1213. doi:10.1111/j.0022-2445.2004.00087.x.

García, B. and Rojas, O. (2002). Cambio en la Formación y Disoluciones de las Uniones en América Latina [Change in the formation and dissolution of unions in Latin America]. *Papeles de Población* (32): 12-31.

Heaton, T., Forste, R. and Otterstrom, S. (2002). Family transitions in Latin America: First intercourse, first union and first birth. *International Journal of Population Geography* 8:1-15. doi:10.1002/ijpg.234.

Jejeebhoy, S.J. (1996). *Women's education, autonomy, and reproductive behaviour: Experience from developing countries, international studies in demography.* Oxford: Oxford University Press.

Mensch, B.S., Singh, S. and Casterline, J.B. (2005). Trends in the timing of first marriage among men and women in the developing world. Policy Research Division Working Paper no. 202. New York: Population Council.

Mier-Terán, M. (2009). El proceso de formación de las parejas en México. In: Rabell-Romero, C. (ed.). *Tramas Familiares en el México contemporáneo.* Mexico city: Instituto de Investigaciones Sociales, UNAM and El Colegio de México, pp. 199-253.

Minnesota Population Center. (2011). Integrated Public Use Microdata Series, International: Version 5.0 (Machine-readable database). Minneapolis: University of Minnesota.

Oppenheimer, V.K. (1988). A Theory of Marriage Timing. *The American Journal of Sociology* 94(3): 563-591. doi:10.1086/229030.

Ruiz, M. and Rodríguez, J. (2011). Familia y Nupcialidad en los censos latinoamericanos recientes: una realidad que desborda los datos. Santiago de Chile: Naciones Unidas (CEPAL Serie Población y Desarrollo).

Rosero-Bixby, L., Castro-Martín, T. and Martín-García, T. (2009). Is Latin America starting to retreat from early and universal childbearing? *Demographic Research* 20(9): 169-194.

Singh, S. and Samara, R. (1996). Early marriage among women in developing countries. *International Family Planning Perspectives* 22 (4):148-157. doi:10.2307/2950812.

Sobotka, T. and Toulemon, L. (2008). Overview Chapter 4: Changing family and partnership behaviour: Common trends and persistent diversity across Europe. *Demographic Research* 19(8): 85-138. doi:10.4054/DemRes.2008.19.6.

Solís, P. and Puga, I. (2009). Los nuevos senderos de la nupcialidad: cambios en los patrones de formación y disolución de las primeras uniones en México In: Rabell-Romero, C. (ed.). *Tramas Familiares en el México contemporáneo.* Mexico city: Instituto de Investigaciones Sociales, UNAM and El Colegio de México: pp. 179-198.

Thornton, A., Axinn, W.G. and Xie, Y. (2007). *Marriage and cohabitation.* Chicago: University of Chicago Press.

United Nations. (1990). *First marriage: Patterns and determinants.* New York: United Nations.

Van de Kaa, D.J. (1987). Europe's second demographic transition. *Population Bulletin* 42(1): 1-59.

Weinberger, M.B., Lloyd, C. and Blanc, A.K. (1989). Women's education and fertility: A decade of change in four Latin American countries. *International Family Planning Perspectives* 15(1):4-28. doi:10.2307/2133273.

Westoff, C.F. (2003). Trends in marriage and early childbearing in developing countries. DHS Comparative Reports. 5. Calverton, Maryland: MEASURE DHS, ICF International: 63 pp.