The Unexpected Decline to Very Low Fertility Levels in Five Latin American Countries. The Role of Education.

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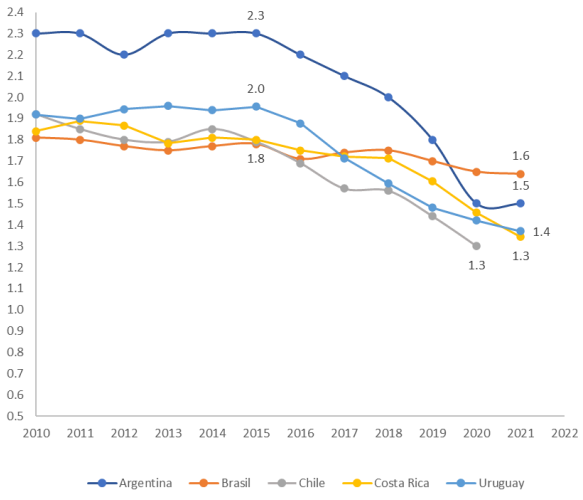
Abstract

Although the negative relationship between education and fertility has shown signs of reversal in some advanced economies, the level of education continues to be closely linked to decreasing fertility in Latin America. We explore fertility patterns by considering maternal education in five Latin American countries that have witnessed significant declines in their TFR in recent years. To this aim, we calculated specific and total fertility rates by education level for the period circa 2010-2020, combining multiple data sources (vital statistics, female population projections by age and official household surveys). A decomposition exercise was also carried out to determine the extent to which the observed variations can be attributed to changes in the distribution of the female population by education or to differences in fertility levels among educational groups. The findings show that lower-educated women experienced the most significant declines in fertility rates, although a reduction in fertility was observed across all educational levels in nearly all countries. However, significant disparities persist in fertility timing and intensity between highly educated women and those in lower and middle education levels. The former consistently exhibit a postponement of fertility in all the countries examined, with fertility levels nearing one child per woman. The decline in adolescent and early fertility, particularly among women with lower educational attainment, played a pivotal role in this reduction and in altering the timing of fertility. The decomposition analysis provides evidence suggesting that behavioral changes within educational groups were the primary driving force behind the observed shifts.

1. Introduction

In recent years, many Latin American countries have experienced an extremely rapid decline in fertility. Most countries in the region had already crossed the replacement threshold by the first decade of this century, with total fertility rates (TFRs) averaging slightly less than two children per woman. In the last five years, the TFRs of several of these countries have fell to levels near or below 1.5. In Chile, Costa Rica and Uruguay, the TFR was actually quite near to 1.3 in 2021.

Figure 1: Total fertility rate for selected countries, 2010-2021



Source: own elaboration based on official statistics of the countries (except for Brazil, data obtained from CEPALSTAT)

Table 1: Age contribution to the overall decrease of TFR (%) between 2010-2021

	Argentina (2010-20)	Brazil (2012-21)	Chile (2010-19)	Costa Rica (2010-21)	Uruguay (2011-21)
<20	23	75	39	38	31
20-24	27	9	32	37	28
25-29	21	3	19	19	23
30-34	20	1	7	8	15
35-39	8	-5	3	-2	1
40+	2	-2	0	-1	0
Total	100	100	100	100	100

Source: own elaboration based on official country statistics.

The fall in adolescent and early fertility explained more than 50% of the reduction in the TFR in all countries. This concludes an idiosyncratic characteristic of the fertility trend in Latin American, namely, a very high adolescent fertility since the 1990s despite the sharp decline in total fertility. The factors that converged to produce the recent decline are not yet well understood. Some research indicates that programmes aimed at reducing adolescent fertility played an important role (Ceni et al., 2021; Rodriguez Vignoli and Roberts, 2020). Likewise, little is known about the socio-economic sectors that played a key role in the recent decline.

Education is one of the most important fertility predictors. From the classic works of Caldwell (1982, 1985) and Jejeebhoy (1995), among others, to the current discussion on the role of educational expansion and its indirect effects on fertility decline (Esteve and Paredes 2018; Cleland, 2002), demography and other social sciences have paid special attention to the relationship between fertility and education (Balbo et al. 2013; Chackiel and Schkolnik, 1996). Empirical evidence has been compelling in showing that, in different development contexts, there is a negative relationship between education and fertility. This relationship has recently weakened in some developed countries because of the high levels of education attained by the population and changes in reproductive behavior linked to the so-called gender revolution (Goldscheider et al. 2015; McDonald, 2000). As can be seen in the regional literature and the results presented below, most Latin American countries are still far from approaching the reversal of the relationship between educational level and fertility; this relationship is negative, and despite advances in access to education, there are still large disparities between social sectors (Pelaez et al. 2022; Cabella et al. 2019, Rodriguez y Cavenaghi, 2014).

This paper contributes to a better understanding of the recent decline by studying the evolution of fertility by educational level in Argentina, Brazil, Chile, Costa Rica, and Uruguay. We expect to answer the following questions: i) Were there differences in TFR by educational group among the countries that drastically decreased fertility over this period? ii) Are there different patterns of fertility timing by educational group? and iii) Do the observed differences reflect changes in educational group reproductive behavior or changes in the educational composition of the female population?

2. Data and methods

Data availability is one of the main challenges for research on fertility by education in Latin America. Several countries have delayed or failed to deliver data for the 2020 census round and only a few countries have recently implemented DHS. Except for Brazil, none of the countries under consideration have ever undertaken a DHS. Following Peláez et al. (2022), we combined information from:

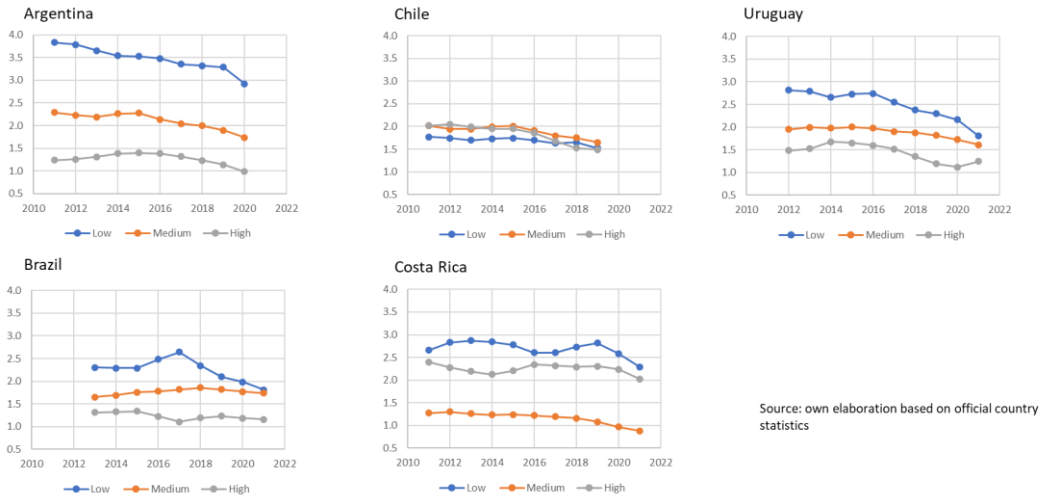
- Births by age and mother's education: official vital statistics of selected countries.
- Female Population by age: CELADE estimates and projections.
- Female Population by age and educational level: harmonized Household Surveys of the countries (CEDLAS).

First, births without information on maternal age and/or education were proportionally distributed (<10% except Uruguay in 2015, 2019 and 2020). Second, the distribution by educational level of the female population for each age group (resulting from the Household Surveys) was applied to the female population of the same age group. Third, we define *ad hoc* three educational levels: low, medium and high.

This data allows us to calculate specific and total fertility rates by education level. We also use Kitagawa's decomposition method to determine the extent to which the observed variations can be attributed to changes in the distribution of the female population by education (composition effect) or to differences in fertility levels among educational groups (rate effect).

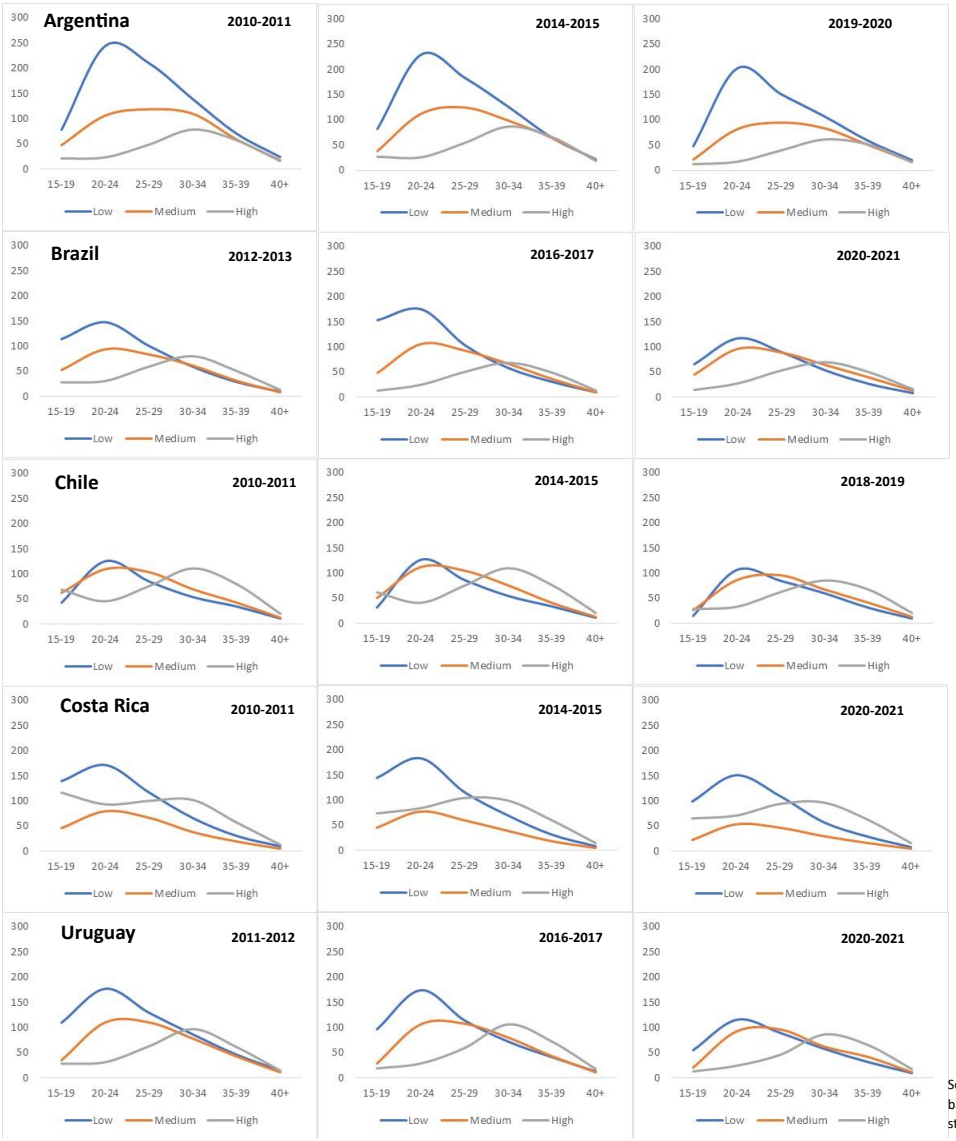
3. Preliminary results

Figure 2: Total fertility rates by level of education of the mother (*circa* 2010-circa 2020)



Source: own elaboration based on official country statistics

Figure 3: Fertility specific rates by age and education of the mother (*circa* 2010; 2015; 2020)



Source: own elaboration based on official country statistics

Table 2: Decomposition of the changes in TFR between 2010 and 2020 by education

		TFR variation (total effect)	Composition effect		Rate effect	
			value	%	Value	%
Argentina	(2010-20)	-0.82	-0.11	13.4%	-0.71	86.6%
Brazil	(2012-21)	-0.13	-0.04	27.7%	-0.10	72.3%
Chile	(2010-19)	-0.47	0.01	-1.5%	-0.47	101.5%
Costa Rica	(2010-21)	-0.50	-0.12	24.3%	-0.38	75.7%
Uruguay	(2011-21)	-0.52	-0.04	7.1%	-0.49	92.9%

Source: own elaboration based on official country statistics.

References

Balbo, N., F. Billari & M. Mills (2013). "Fertility in advanced societies: A review of research " *European Journal of Population* 29: 1-38.

Caldwell, J. C., P. H. Reddy & P. Caldwell (1985). Educational transition in rural South India., *Population and Development Review*, vol. 11, No.1, pp.29-51.

Caldwell, J. C. (1982). *Theory of Fertility Decline*. London: Academic Press.

Chackiel, J., & S. Schkolnik (1996). Overview of the fertility transition. In. *the Fertility Transition in Latin America,* Guzman, J.M., Singh, S., Rodriguez, G., & Pantelides, E.A. (eds). Oxford: Clarendon Press, pp. 3-26.

Ceni, Rodrigo, Cecilia Parada, Ivone Perazzo, and Eliana Sena. 2021. "Birth Collapse and a Large-Scale Access Intervention with Subdermal Contraceptive Implants." *Studies in Family Planning* 523: 321-342.

Esteve, A., & Florez-Paredes, E. (2018). The Stability Paradox: Why Expansion of Women's Education Has Not Delayed Early Union Formation or Childbearing in Latin America. Studies in *Family Planning*, 49(2), 127–14

Goldscheider, F., Bernhardt, E., & Lappegård, T. (2015). The gender revolution: A framework for understanding changing family and demographic behavior. *Population and Development Review*, 41(2), 207–239.

Jejeebhoy, S. J. (1995). *Women's Education, Autonomy, and Reproductive Behaviour*. Oxford: Oxford University Press.

Kitagawa, E. M. (1955). Components of a Difference Between Two Rates. *Journal of the American Statistical Association*, 50(272), 1168–1194.

McDonald, P. (2000). Gender equity in theories of fertility transition. *Population and Development Review*, 26(3), 427–439.

Naciones Unidas (2022). Naciones Unidas, Departamento de Asuntos Económicos & Sociales, División de Población (2022). World Population Prospects 2022, edición

Peláez, E., Cuesta, C. D. L., Pastorino, L. A., Trincheri, T. M., & Viganó, A. (2022). La fecundidad en Argentina a inicios del siglo XXI: ¿el fin de la meseta? El papel de la educación en los cambios. *Revista Brasileira de Estudos de População*, 39.

Rodriguez-Vignoli J. & Cavenaghi, S. (2014). *Adolescent and youth fertility and social inequality in Latin America and the Caribbean: what role has education played? Genus*, v. 70, n. 1.

Rodriguez-Vignoli, J. & San Juan Bernuy, v., V. *Maternidad, fecundidad & paridez en la adolescencia & la juventud: continuidad & cambio en América Latina*. Santiago de Chile: (CEPAL), 2020. (Serie Población & Desarrollo, n. 131).

Rodriguez Vignoli, J., & Roberts, A. (2020). El descenso de la fecundidad adolescente en Chile: antecedentes, magnitud, determinantes & desigualdades. Instituto Nacional de la Juventud, Ministerio de Desarrollo Social (Serie de Estudios No.12). Santiago de Chile.