

Multilevel exploration of factors associated with family size preferences and non-response to fertility preference questions in Mexico's National Demographic Dynamics Survey

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Abstract

Understanding fertility intentions is critical for planning towards future reproductive health behavior. In this paper, we will explore the issue of non-response fertility preference questions, specifically the question regarding desired family size. This topic has been largely neglected in the literature on fertility intentions. Determining what drives non-responses to fertility intention questions may lead to a better understanding of fertility decision-making and its outcomes, particularly in a country such as Mexico, which has reached the fertility replacement level, but where there are still clear differences in fertility levels across states and subpopulation groups. We will use multi-level modelling to analyze factors associated with non-response to fertility preference questions using data from Mexico's National Demographic Dynamic Survey. We will also explore the factors associated with family size preferences in order to identify whether or not there are differences regarding the determinants of the non-response and the desired family size.

Background

In recent years, the analysis of fertility desires and intentions has played a crucial role in explaining fertility trends and patterns, both in context of high- and low-fertility countries. In high-fertility countries, fertility preferences (i.e., desired family size) at the individual and aggregate level may be lower than actual fertility, which may suggest unmet needs for family planning (Machiyame et al., 2017). Conversely, in low-fertility countries fertility preferences are generally higher than actual fertility (Goldstein et al., 2003). Research on fertility intentions suggest that desired family size and the intention to have (more) children affect fertility behavior (Miller 1994; Schoen et al., 1999). Fertility intentions are also of special interest to policymakers who want to close the gap between the desired number of children and the actual birth rate (Philipov 2009; Kuhnt et al., 2021). According to Frye and Bachan (2017), non-numeric answers to questions about fertility intentions, in addition to playing a central role in classical theories of the fertility transition (Coale 1973; Van de Walle 1992), provide important insights into the cultural and developmental processes underlying fertility change.

In this paper, we will focus on the issue of non-response fertility preference questions, specifically the question regarding desired family size. This topic has been largely neglected in the literature on fertility intentions. Determining what drives non-responses to fertility intention questions may lead to a better understanding of fertility

decision-making and its outcomes, particularly in a country such as Mexico, which has reached the fertility replacement level, but where there are still clear differences in fertility levels across states and subpopulation groups.

Methods and Data

Our aim is to identify if the same factors are associate with non-response to fertility preference questions, and if the non-response has its own idiosyncratic performance.

Using the National Demographic Dynamic Survey (ENADID, 2018), we adjust multilevel models for two different response variables, with the same covariates and with intercept random effects. Individuals are nested in 63 group of rural/urban and state residency.¹ We predict ideal offspring size using mixed regression with covariates at first level associates with females features such as: age (with a quadratic term), number of actual children ever born (with a quadratic term), indigenous self-identification, conjugal situation, household socioeconomic status (following Echarri Cánovas, 2008), labor participation, years of schooling and household's residence family arrangement.

For second level predictors we included the percentage of non-religious population and female labor %, as indicators of societal changes and settings. We use the 2020 microdata census extended survey (CA 2020) to calculate these variables.

Preliminary results

As Mexico is a heterogenous country, states dynamics are different across country as well economic and social institutions. Rural and urban areas are also different across states. As Figure 1 shows Mexico City is the only urban where women have ideal size under the normative size of two. While overall rural areas have higher number of children desired, in some state rural and urban areas differences are not statistically significative. Nonresponse rate presents a more heterogenous behavior across entities. Rural areas have higher nonresponse rate but with greater confidence intervals. Also, we notice that nonresponse is not consistent with the family size ideal estimates.

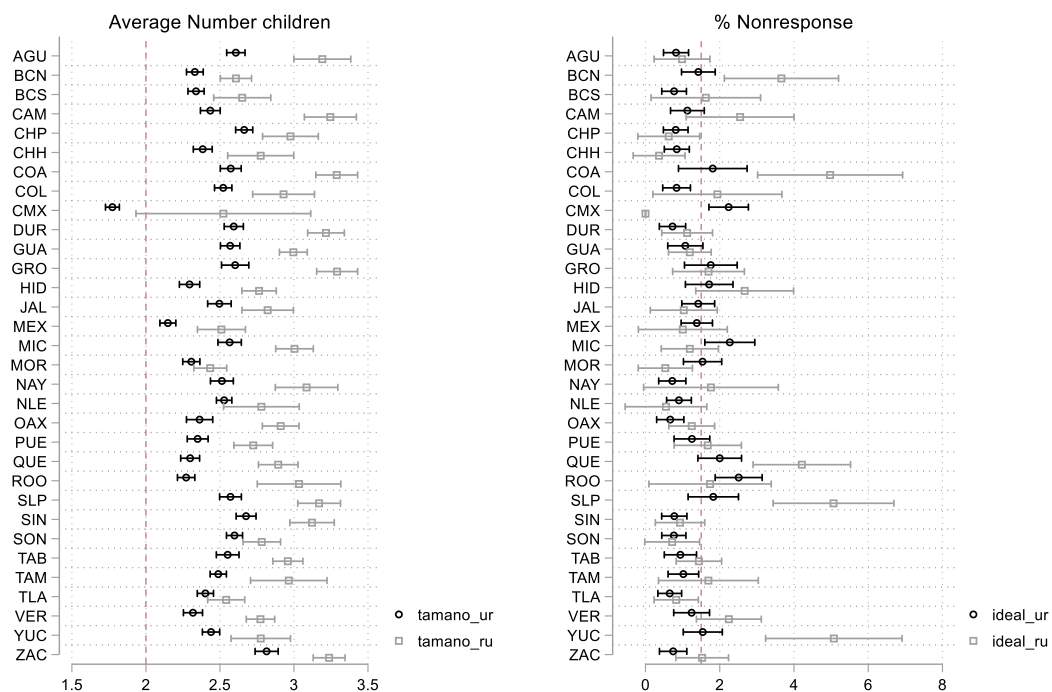
Models shows² that average marginal effects of individual level covariates present different performance across both fertility preferences (see Figure 2). Schooling years and indigenous self-identifications operates in the same direction, more school years implies lesser size of ideal family and lesser probabilities of non-response; an indigenous woman has more probability of nonresponse and higher family size ideal. While age, number of children ever born (CEB) and union marital status (ref. never been married or cohabited) have different effects on family size ideal estimation and nonresponse: these covariates have negative effect on family size ideal and predicts higher nonresponse probability.

¹ There is 32 states, but for Mexico City's rural localities are not well represented in the survey. We excluded them from the analysis.

² Models adjusted are in the appendix

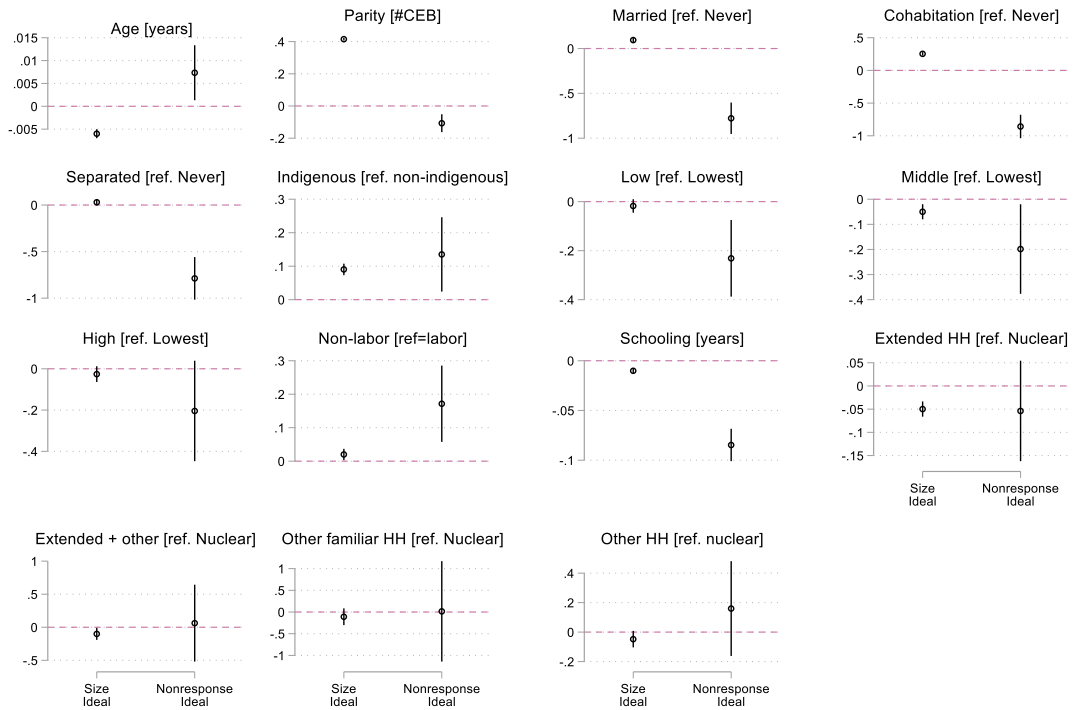
Second level predictors are not statistically significant for probability of the non-response, but still there is some evidence of grouped variance at that level. We are assessing other second level predictors related to fertility intentions and to regional development. Nonresponse has sociodemographic and societal predictors, is not a random phenomenon. We have presented evidence on how this nonnumeric preference operates in Mexico.

Figure 1. Average number of children as ideal family size(left) and Nonresponse rate(right). States and rural/urban areas. Averages and confidence interval (95%)



Note: red line in left panel is 2, as the normative preference. In right panel the line is the overall nonresponse rate.

Figure 2. Average marginal effects for individual predictors. Average change and confidence interval (95%)



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Appendix

Table 1. Multilevel linear models for the family size ideal. Mexico, 2018

	Null Model		Model individual		Model Individual + Group	
eq1						
Age			-0.0811***	(0.00268)	-0.0813***	(0.00268)
Age ²			0.00113***	(0.0000372)	0.00113***	(0.0000372)
Children ever born			0.345***	(0.00740)	0.345***	(0.00740)
Children ever born ²			0.0199***	(0.00103)	0.0199***	(0.00103)
Married			0.0941***	(0.0134)	0.0939***	(0.0134)
Cohabitation			0.254***	(0.0137)	0.254***	(0.0137)
Separated			0.0297	(0.0165)	0.0301	(0.0165)
Never			0	(.)	0	(.)
Indigenous self-identification=0			0	(.)	0	(.)
Indigenous self-identification=1			0.0922***	(0.00881)	0.0904***	(0.00879)
Lowest			0	(.)	0	(.)
Low			-0.0196	(0.0140)	-0.0176	(0.0140)
Medium			-0.0519***	(0.0153)	-0.0499**	(0.0153)
High			-0.0272	(0.0194)	-0.0258	(0.0194)
Labor participation			0	(.)	0	(.)
Non-Labor participation			0.0210*	(0.00860)	0.0201*	(0.00860)
Years of schooling			-0.0103***	(0.00124)	-0.0101***	(0.00124)
Nuclear			0	(.)	0	(.)
Extended			-0.0495***	(0.00836)	-0.0498***	(0.00836)
Extended + other			-0.101*	(0.0462)	-0.101*	(0.0462)
Other familiar			-0.110	(0.0984)	-0.109	(0.0983)
Other			-0.0481	(0.0285)	-0.0478	(0.0285)
% non-religious population					-0.992*	(0.426)
Female Labor %					-1.243***	(0.169)
_cons (great mean)	2.681***	(0.0397)	3.173***	(0.0502)	3.720***	(0.0807)
Var(States+rural/urban)						
_cons	0.311***	(0.0283)	0.192***	(0.0178)	0.130***	(0.0126)
Var(individuals)						
_cons	1.469***	(0.00318)	1.253***	(0.00271)	1.253***	(0.00271)
Observations	106723		106723		106723	
Intraclass correlation	0.0430		0.0230		0.0106	
Log-Likelihood	-		-175614.9		-175591.6	
	192635.3					

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 2. Multilevel logit models for the probability of nonresponse. Mexico, 2018

	Null Model	Model individual	Model Individual + Group
eq1			
Age		0.00327 (0.0162)	0.00309 (0.0162)
Age ²		0.0000602 (0.000232)	0.0000640 (0.000232)
Children ever born		-0.270*** (0.0404)	-0.271*** (0.0404)
Children ever born ²		0.0462*** (0.00390)	0.0461*** (0.00390)
Married		-0.775*** (0.0893)	-0.778*** (0.0893)
Cohabitation		-0.857*** (0.0913)	-0.858*** (0.0913)
Separated		-0.787*** (0.117)	-0.788*** (0.117)
Never		0 (.)	0 (.)
Indigenous self-identification=0		0 (.)	0 (.)
Indigenous self-identification=1		0.138* (0.0566)	0.135* (0.0566)
Lowest		0 (.)	0 (.)
Low		-0.237** (0.0795)	-0.231** (0.0797)
Medium		-0.204* (0.0908)	-0.198* (0.0909)
High		-0.209 (0.124)	-0.204 (0.124)
Labor participation		0 (.)	0 (.)
Non Labor participation		0.175** (0.0580)	0.172** (0.0581)
Years of schooling		-0.0853*** (0.00830)	-0.0847*** (0.00831)
Nuclear		0 (.)	0 (.)
Extended		-0.0543 (0.0552)	-0.0539 (0.0552)
Extended + other		0.0591 (0.297)	0.0620 (0.297)
Other familiar		0.0149 (0.590)	0.0151 (0.590)
Other		0.160 (0.164)	0.160 (0.164)
% non religious population			2.445 (1.504)
Female Labor %			-0.884 (0.606)
_cons	-4.277*** (0.0720)	-2.991*** (0.269)	-2.854*** (0.356)
Var(States+rural/urban)			
_cons	0.506*** (0.0546)	0.429*** (0.0496)	0.411*** (0.0484)
Observations	108325	108325	108325
Intraclass correlation	0.0721	0.0529	0.0489
Log-Likelihood	-8187.4	-7839.0	-7837.2

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$