

Understanding non response rates: insights from 600,000 opinion surveys

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Abstract

This paper explores the determinants of item non-response using data from over half a million opinion surveys. Both respondent's characteristics and survey design affect response rates. On average, younger, less educated, single and poorer populations tend to have higher non-response rates. Factors such as the day the interview was conducted, the language of the questionnaire and an interviewer's attributes also explain response rates, but these are usually under the influence of the institution designing the survey, which points towards potential ways of improving response rates. Finally, missing rates are not distributed uniformly across different types of questions, but rather some categories such as questions on current affairs have systematically lower response rates. Taken together, the evidence provided warns about potential biases arising from estimating indicators from questions where non-response is not random.

JEL classification: C81, C83, I32

Key words: Item response rate; Surveys; Biased indicators

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1 Introduction

Quality of surveys is at odds. In developed countries, the quality of household surveys has deteriorated during the last decades (Meyer, Mok and Sullivan, 2015) and such decline in quality is even worse for public opinion surveys (Pew, 2012). The situation in the developing world is more worrisome, where many countries are “data deprived,” meaning they have little or no surveys at all (Serajuddin et al., 2015).

Fundamentally, quality of surveys has been defined according to three metrics: i) unit non response (i.e., whether an individual part of the sampling frame agrees to respond the survey or not); ii) item non-response (i.e., whether the interviewees responds every item of the questionnaire or not); and iii) measurement errors (i.e., whether the answer to the question is accurate or not). These three issues are particularly relevant since they contribute to bias in statistics calculated from survey data. If non-response is not random across the population, survey data would lead to biased estimates of distributions (Groves, 2006).

Of these issues, increasing unit non-response (individuals not answering surveys at all) has gotten most attention in the literature. Among the reasons that explain the rising trend include more concerns about privacy, increasing urbanization, and declining cooperation due to individuals being overwhelmed by surveys.¹

Less attention has been given to individuals not answering *some* of the questions. Indeed, the effects of factors such as the length of the survey, the characteristics of the interviewer and the propensity of certain types of questions to be skipped have been relegated to a second plane. However, understanding the relationship between these underlying factors and the response rate is relevant from a policy perspective to inform the design of surveys.

Moreover, profiling the individuals with higher likelihoods of skipping questions is important for assessing the reliability of data used for empirical economic analysis. For instance, it is a well-known fact that the top of the income distribution is not captured accurately in household surveys because wealthier people are less likely to answer surveys, but also because they tend to underreport their income if

¹See, for instance, Groves and Couper 1998; Presser and McCulloch 2011; and Brick and Williams 2013.

they decide to answer the income questions at all. This particular issue has direct implications on income inequality measurement.

This paper seeks to fill a gap in the literature by exploring the determinants of item non-response. I analyze data from over 600,000 opinion surveys over a twenty-year time span to tackle three main questions. First, what individual factors predict higher non-response rates? To answer this, I analyze the relationship between non-response rates and individual's observable characteristics such as age, civil status, gender, educational level, employment status and religion.

Second, what factors underlying the design of the survey affect response rates? Here I study the link between the missing rates and factors that are in general under the direct control of the institutions that conduct the surveys, including the day when the interview is conducted, the length of the interview, the language of the questionnaire and the characteristics of the interviewers. Finally, are certain types of questions less likely to be answered? To answer this, I analyze question-level data from surveys, and correlate the different categories of questions with the response rates to see which of them are less likely to be answered, *ceteris paribus*.

To my knowledge this is the first paper that combines the data collected from respondent's together with the metadata from the questionnaires in order to analyze in detail the drivers behind surveys non-response. Moreover, by making use of a large amount of data I am able to estimate small effects and test subtle hypotheses.

Results show that certain individual characteristics predict response rates, namely, the age of the respondent, gender, religion, education level, area of residence and ownership of durable goods. "Poorer" (meaning less educated, owning less goods, without access to basic services), single young females tend to have lower response rates. Results also show that survey design matters when it comes to response rates, and that decisions such as the time of the day the interview is conducted and the selection of interviewers should not be left to chance.

Finally, I find that response rates are not uniformly distributed across questions, but rather some categories of questions have systematically higher response rates. In particular, questions related with the economy have on average higher rates, while those related with current affairs have consistently lower response rates.

The rest of the paper is organized as follows. Section two reviews the related

literature. Section three presents the data and empirical strategy. The fourth section presents the main results, along with robustness tests. Section five concludes.

2 Related literature

This paper is related with the literature on the design of surveys and the determinants of response rates. One strand of such literature focuses on “design effects” and “interviewer effects” in face-to-face interviews. Among these papers, the seminal work of O’Muircheartaigh and Campanelli (1995) compares the relative impact of both of these effects on survey precision, finding that both the design and interviewer effects increase the variance of the answers in a survey in comparable magnitudes. In a similar vein, O’Muircheartaigh and Campanelli (1999) find that the variability in refusals to answers in surveys and non-contact rates is due more to the influence of interviewers than to the influence of geographic areas.

A second related strand of the literature focuses on the response rates of sensitive questions and the way answers differ according to survey design, including factors such as data collection mode and question format. Among these papers, Smith and Tourangeau (1996) show that computer-assisted self-administration increases respondents’ willingness to make potentially embarrassing admissions in surveys since self-administration foster a greater sense of privacy of the collection process.

A third strand focuses on the effect of the length of the questionnaire on the quality of the answers. Among these papers, Kilic and Sohnesen (2015) analyzes an experiment implemented in Malawi finding that the same households answered the same questions differently depending on the length of the questionnaire. Moreover, the authors find statistically significant differences in responses to a short vs. a long questionnaire across all topics and types of questions.

Finally, some additional papers focus on whether computer-assisted personal interviewing is more efficient than the traditional pen-and-paper method. Among these papers Caeyers et al. (2010) reports on a randomized survey experiment among 1,840 households, finding that pen-and-paper data contain a large number of errors, which can be avoided with the use of electronic devices.

This paper makes two distinct contributions relative to this literature. First, instead of analyzing one particular country, the data comes from 27 countries in Latin America and the Caribbean plus Spain and the United States, and therefore the external validity of the results has a larger scope. Second, I test a rather large list of response rates correlates, instead of focusing on just one mechanism.

3 Empirical Strategy and Data

This paper relies on two complementary public opinion surveys. The first one is conducted by Latinobarómetro in 18 Latin American countries and Spain since 1995, interviewing about 1,200 individuals per country each year (with the exception of 2012 and 2014) about individual socioeconomic background, and preferences towards social and political issues. The second database comes from the Latin American Public Opinion Project (LAPOP). In addition to the countries covered by Latinobarómetro, this database includes information from the Caribbean and United states, although the time span covered is shorter since the survey started in 2004, and the survey wasn't conducted in 2011 nor 2013. LAPOP also interviews about 1,200 individuals per country each year about political issues. In both cases samples are representative at the national level for the voting-age population. About two thirds of the observations from my database come from Latinobarómetro (roughly 410,000) and the rest from LAPOP (about 200,000).

The distinguishing feature of these databases is that they also include the questionnaires' "meta-data", meaning all the information underlying the survey design. For instance, it is possible to know from both databases in which particular day each interview was conducted and how many questions the respondents decided not to answer. Conveniently, both databases include a core set of common variables, such as the demographic characteristics of the respondent, their labor status and access to basic services and durable goods (Table A1 in the Appendix offers a list of available variables and their sample size). At the same time, each dataset on its own has a specific set of variables useful to answer particular questions regarding response rates. For instance, LAPOP has information about the gender and skin color of the interviewer and respondent (see Appendix B for more information about this variable), while Latinobarómetro has information about the perception of the respondent, about respondents reaction to the different sections of the survey as well as their perception about the survey length and depth.

The main variable in the analysis is the item non-response rate of each interviewed individual. To construct this variable, I calculate the ration between the number of questions the respondent chose not to answer and the total number of questions that the interviewer asked. This is the variable used as a dependent

variable in the regressions. In the baseline specification, I assume that non response rates can be characterized according to the following equation:

$$NR_{ict} = \beta_0 + \beta_1 \delta_{ict} + \beta_2 \gamma_{ict} + \sum_c C_c + \sum_t T_t + \epsilon_{ict} \quad (1)$$

where NR_{ict} is the non-response rate of individual i in country c in year t ; δ is a vector of individual characteristics that includes the age, gender, civil status, religion, education, employment status; access to services and asset ownership; γ is a vector of variables related with the interview such as the gender of the interviewer, the time and day of the week the interview was conducted, and whether the language of the interview is the same as a respondent's native language; C is a vector for country fixed effects; T is a vector for year fixed effects; and ϵ_{ict} is the error term.

I am interested in the sign and magnitude of β_1 and β_2 . The first of these coefficients captures the relationship between all the individual characteristics and the response rate. If non-response is random, then this coefficient should to be statistically not different from zero. On the other hand, β_2 captures the relationship between survey design and non response. Since these variables depend on the institution that conducts the survey, and therefore can be partially controlled, they are of particular interest.

The second part of the analysis seeks to respond whether particular types of questions are less likely to be answered. To answer this, I categorize each question asked in every country and year using Latinobarómetro's codebook.² In total, I calculate the response rate of over 2,200 questions divided into 7 categories and 25 subcategories (Table 2 lists the categories and sample sizes).

In this case, I run a similar set of regressions but using question-level data instead of individual level. Taking advantage of the fact that questionnaires are similar across countries in a given year and that most questions are preserved over time, I estimate the following model:

²Since LAPOP doesn't have an equivalent document, thus for this analysis I only use Latinobarómetro's data.

$$NR_{qct} = \beta_0 + \sum_q Cat_q + \sum_c C_c + \sum_t T_t + \epsilon_{qct} \quad (2)$$

where NR_{qct} is the non response rate of question q in country c in year t ; Cat_q is a vector of dummy variables for the category (or subcategory) of each question. In this case the object of interest is the sign and magnitude of the coefficients of each of the dummies that indicate the type of question.

3.1 Descriptive statistics of the sample

Table 1 shows basic descriptive statistics of the sample. About half of the surveys (46.8%) were made in large cities of over a million inhabitants, and about two thirds of them (65%) were conducted in urban areas.

Roughly half of respondents were women (51.1%), with an average age of 39.7 (most interviewees (40.3%) were aged 25-40). Over half of the sample (57.9%) reported being married or in a civil union, and most profess a religion, being Catholicism the most frequent one (65.8%).

Over 90 percent of interviewees knew how to read and write and only 7.1 percent never attended school. The majority of respondents (77.5%) completed at least primary school, and a third of them (33.1%) had secondary education or more. Almost two thirds of the sample (63.7%) were part of the labor force, and 11.2% of them were unemployed.

Access to basic services among respondent's is relatively high: 84.5% of individuals report having access to running water inside their dwelling and over two thirds of them (73.7%) report that their dwellings have access to a flush toilet connected to waste-removal system (i.e., sewage). Ownership of durable goods ranges from low levels on computers and cars (27.9% and 30.5%, respectively) to high levels on mobiles (73.7%), fridges (79%) and TV's (90.8%).

One of the distinguishing features of the surveys is that they include the administrative information behind each interview. It is possible to track the id of 14,580 interviewers, 2,743 supervisors and 2,116 data entry clerks. The majority of the surveys (61.8%) were done by females, and in 48% of the interviews the interviewee and interviewer had different genders. A small amount of surveys

(4.3%) were conducted in a language other than respondent's native language. Interestingly, in 78.8% of the surveys, the interviewer reports having a different skin color than respondent's, split relatively evenly between lighter and darker colors (Annex B describes in further detail this variable).

Surveys were conducted relatively uniformly along weekdays, although Saturday (17.2%) and Sundays (14.6%) were the most frequent days. Similarly, interviews were evenly distributed across the month, being the middle of the month the most popular date. February and September were the most frequent months to conduct the interviews (See Figure A1 of the Appendix for a visual representation).

The typical interview started at 15:25, and conditional on being answered, lasted on average 45 minutes (although there is a considerable variation in the interview's duration: the standard deviation is 17 minutes). During that time, respondents were asked, on average, 252 questions (i.e., about 5 questions per minute). In 53.2% and 36.8% of the surveys, the interviewer reported that the respondent found the survey very deep and very long, respectively. In 14.6% of the interviews, respondents found some questions offensive, too intrusive or indiscrete to be answered, and in 16.1% of the surveys the interviewers had difficulties or were uncomfortable asking some of the questions.

Despite this, response rates are remarkably high in the sample. The mean [median] non response rate across all individuals and years is 1.9 [0.9] percent, which means that the average individual answered most of the questionnaire.³ Non-response rates are still low even conditional on not responding at least one question, in which case the average is 2.85 percent.

³Interestingly, average response rates seem to be slightly different across databases. Regressing non-response rate on a dummy variable that indicates if the data comes from LAPOP -and controlling for the countries and years sampled- yields a statistically significant coefficient of -2.7 which could point towards different surveying methods or interviewer training. For this reason I also control for the source of the data in all regressions.

Table 1: Descriptive statistics of the sample

Variable	Mean	Std. Dev	Observations
Interviewee related variables			
<i>Sociodemographic and Regional variables</i>			
Age	39.7	16.27	606,049
Male respondent (%)	48.9	0.50	608,275
Married or civil union (%)	57.9	0.49	556,917
Catholic religion (%)	65.8	0.47	602,550
City of over a million inhabitants (%)	57.9	0.49	299,404
Urban area (%)	65.0	0.48	192,336
<i>Education and Labor Market variables</i>			
Literate (%)	91.5	0.28	585,398
Secondary education or more (%)	33.1	0.47	585,398
Unemployed (%)	11.2	0.32	337,507
Economically active (%)	63.7	0.48	530,347
<i>Durable goods and access to services</i>			
Access to running water (%)	84.5	0.36	546,328
Access to a sewage (%)	67.7	0.47	439,481
Mobile ownership (%)	72.6	0.45	218,899
Computer ownership (%)	28.0	0.45	592,838
TV ownership (%)	90.8	0.29	514,339
Interview related variables			
Male interviewer (%)	38.2	0.49	99,380
Interview in language other than native (%)	4.3	0.20	406,282
Skin color of interviewer (1: light; 11: dark)	5.2	1.79	97,607
Skin color of respondent (1: light; 11: dark)	5.2	2.05	97,359
Day of the week (1: Monday; 7: Sunday)	4.1	2.01	489,849
Day of month interview was conducted	15.5	8.58	491,126
Month when interview was conducted	6.1	3.30	490,143
Length of the interview (minutes)	44.7	17.57	366,682
Number of questions asked in the interview	252.4	69.17	608,319
Number of questions not responded	5.3	8.58	608,319
Perception of interview as very deep (%)	53.2	0.50	145,184
Perception of interview as very long (%)	36.8	0.48	350,507
Respondent was upset about at least one q' (%)	14.5	0.35	203,300
Interv. had difficulty asking at least one q' (%)	16.1	0.37	243,066

Source: Own elaboration based on Latinobarómetro and LAPOP.

Non-response seems to be decreasing overtime (Figure A2, left panel) since the 2000's, at least in Latinobarómetro survey. This trend also holds across types of questions, Figure A2 (right panel) shows the evolution of non-response rates for the four main categories of variables which together account for over 90 percent of the questions asked in Latinobarómetro. LAPOP's non-response rate is consistently low and relatively stable under one percent in all the years, with the exception of 2013 where it had a modest increase.⁴ Low non-response rates at the individual level leads to high response rates at the question level. Table 2 shows response rates across all categories and subcategories, as well as the number of questions in each category.

As can be seen, as a consequence of non-response rates being low across respondents, non-response rates are also low at the question level. Over a third of the questions have no missing responses at all and, the mean response rate of all questions is of 97 percent (i.e., each question was answered by 97 out of 100 respondents, on average). However, there are notable heterogeneities across different types of questions. Non-response rates range from close to zero in the subcategory "evaluation of the economy" (0.5 percent, on average) to above 8 percent in the questions on current political issues.

⁴Econometric evidence confirms these results: regressing non-response rates on yearly dummies (using 2001 as base year and controlling for the source of data) yields a negative coefficient in every year of the 2000's, and the magnitude of those coefficients in absolute terms increases over time.

Table 2: Non response rates by category of questions

Category / Subcategory	Mean (%)	Median (%)	Std. Dev.	Questions
<i>Communication Media</i>	2.4	0.0	7.2	5,680
Communication media	6.3	2.1	11.0	1,770
Internet	0.6	0.0	3.3	3,910
<i>Culture and Social Networks</i>	1.4	0.9	4.3	318
Culture and Social Networks	1.4	0.9	4.3	318
<i>Democracy</i>	3.1	0.7	8.6	38,773
Attitudes toward Authoritarianism	4.3	2.6	4.4	646
Attitudes toward Democracy	4.2	1.3	12.0	3,727
Civic Culture and Politics	2.7	0.4	8.2	17,630
Confidence	1.8	0.6	5.6	5,692
Democracy and the economy	7.7	7.3	4.1	654
Institutions	4.7	0.9	10.0	3,983
International Relations	3.5	0.0	10.7	4,263
Law and Constitution	1.7	0.6	3.1	2,178
<i>Economy</i>	1.7	0.6	3.3	11,603
Consumer Goods	1.8	0.9	3.2	3,880
Corporate Social Responsibility	3.6	0.0	6.8	194
Economic Mentality	2.3	1.3	3.1	1,148
Evaluation of the economy	0.5	0.0	1.2	1,193
Expectation of Development	3.7	1.7	4.6	758
Index of Economic Sentiment	0.7	0.3	1.8	2,350
Market Economy	4.8	2.9	4.9	501
Privatizations	2.6	1.5	4.1	320
Quality of Living	1.2	0.2	2.6	1,259
<i>Public Policies</i>	3.1	1.1	7.1	22,738
International Relations	4.2	1.7	8.4	9,228
Poverty	3.7	1.6	4.8	1,354
Problems in the country	2.2	0.6	6.1	12,156
<i>Questions on current issues</i>	8.1	3.9	9.3	255
Questions on current political issues	8.1	3.9	9.3	255
<i>Sociodemographic Variables</i>	4.3	0.0	11.4	8,297
Sociodemographic Variables	4.3	0.0	11.4	8,297
<i>Total</i>	3.0	0.7	8.0	87,664

Source: Latinobarómetro's Codebook.

4 Results

I begin by estimating model (1) using individual level data to assess the relative size and significance of the vector of coefficients β_1 (capturing individual level determinants) and of β_2 (capturing the different characteristics behind the design of the survey).

4.1 Individual's attributes

To analyze what respondent's attributes predict item response I include demographic variables such as the age and gender of the interviewee, their maximum level of educational attainment, civil status, employment status, asset holding and access to services. Table 3 summarizes the main results of the Ordinary Least Square (OLS) regressions under different specifications.

Column (1) presents the results controlling for age, age squared and gender. column (2) includes dummies for civil status, religion, literacy and educational attainment. Column (3) incorporates dummies for labor market variables: labor force participation and unemployment. Column (4) includes access to basic services and asset ownership, including, access to running water and sewage, and ownership dummies for car, fridge, computer, washing machine, telephone, TV. Finally column (5) incorporates a self-reported ideology index that ranges 1 "left wing" or liberal to 10 "right wing" or conservative. All specifications include fixed effects for country, year, and datasource. It's important to note that, as additional variables are included the number of observations decreases exponentially since not all variables are available in all countries and years. The column (1) specification includes over 600,000 observations while the specification that includes all individual's controls has a sample size of a little over 230,000 observations.

Table 3: Individual's correlates of non response rates

	(1)	(2)	(3)	(4)	(5)
Age	-0.030*** (0.002)	-0.025*** (0.002)	-0.021*** (0.002)	-0.022*** (0.002)	-0.014*** (0.002)
Age squared	0.001*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Male	-0.384*** (0.007)	-0.374*** (0.008)	-0.386*** (0.009)	-0.481*** (0.013)	-0.292*** (0.011)
Married dummy		-0.071*** (0.009)	-0.075*** (0.009)	-0.088*** (0.013)	-0.058*** (0.012)
Catholic dummy		-0.095*** (0.009)	-0.146*** (0.010)	-0.170*** (0.014)	-0.072*** (0.013)
Literacy dummy		-0.527*** (0.050)	-0.630*** (0.058)	-0.789*** (0.082)	-0.580*** (0.081)
Incomplete Primary Education		-0.527*** (0.055)	-0.480*** (0.062)	-0.455*** (0.088)	-0.002 (0.086)
Complete Primary Education		-0.883*** (0.057)	-0.891*** (0.065)	-0.925*** (0.091)	-0.345*** (0.088)
Incomplete Secondary Education		-1.131*** (0.056)	-1.164*** (0.064)	-1.183*** (0.090)	-0.522*** (0.088)
Complete Secondary Education		-1.288*** (0.057)	-1.337*** (0.064)	-1.291*** (0.091)	-0.600*** (0.088)
Incomplete Tertiary Education		-1.411*** (0.057)	-1.489*** (0.064)	-1.403*** (0.091)	-0.686*** (0.089)
Complete Tertiary Education		-1.579*** (0.057)	-1.612*** (0.064)	-1.426*** (0.091)	-0.724*** (0.088)
Unemployed dummy			0.042*** (0.016)	-0.006 (0.023)	-0.002 (0.021)
Economically active dummy			-0.107*** (0.011)	-0.199*** (0.015)	-0.134*** (0.013)
Access to running water				-0.255*** (0.023)	-0.215*** (0.021)
Access to sewage system				-0.194*** (0.017)	-0.123*** (0.015)
Refrigerator in Home				-0.337*** (0.020)	-0.197*** (0.018)
Computer in Home				-0.069*** (0.014)	-0.055*** (0.013)
Washing Machine in Home				-0.096*** (0.015)	-0.066*** (0.014)
Landline in Home				-0.225*** (0.014)	-0.147*** (0.012)
Has access to a car				-0.083*** (0.013)	-0.066*** (0.012)
Television in Home				-0.672*** (0.029)	-0.405*** (0.027)
Ideology (Left / Right)					-0.007*** (0.002)
Constant	1.490*** (0.046)	3.537*** (0.055)	4.552*** (0.059)	6.023*** (0.113)	4.145*** (0.100)
Country FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Database FE	Yes	Yes	Yes	Yes	Yes
Observations	606,012	532,972	470,031	299,073	233,001
R-squared	0.228	0.251	0.228	0.188	0.164

Note: Dependent variable is the share of questions not responded by each individual. ***, ** and * denote significance at 10%, 5% and 1% levels, respectively, calculated using robust standard errors.

The results are quite robust across specifications. Older people tend to respond more items of surveys, with a non-linear effect as the coefficient of age squared has the opposite sign and is statistically significant. Females tend to respond less parts of the questionnaire, although the magnitude of the difference is relatively low: under half a percentage point in all specifications. Being Catholic and Married also correlate negatively with non-response rates, i.e., they tend to have higher response rates. The effect of education is unambiguously positive on response rates: in all the specifications, both the literacy dummy and the educational attainment dummies are negatively correlated with non-response rates. Moreover, the magnitude of the coefficient increases in absolute terms with the level of qualification: *ceteris paribus*, those with complete tertiary education have response rates over one percentage point higher than those with no education at all, on average.

Participating in the labor force is positively associated with response rates, but the effect of being unemployed doesn't seem to be statistically different from zero. All the dummy variables for access to basic services and asset ownership have negative signs, meaning higher response rates on average. If ownership of such assets is correlated with wealth, that would mean that wealthier people tend to skip less questions. Finally, the ideology index correlates negatively with non-response rates, meaning people that report being more conservative also tend to answer more other parts of survey, although the magnitude of the coefficient is very small.

In short, results from Table 3 depict the population with higher non-response rates as relatively younger, less educated, single and poorer.

4.2 Survey design

Next, I turn into the aspects behind the design of the survey that affect response rates. In this case I analyze the date the survey was conducted, it's length, duration, whether it was conducted in the same language as the respondent's native language, and the characteristics of the interviewer including skin color and gender. Tables 4 and 5 summarizes the results. All the results include controls for individual characteristics (similar to those of column (4) of Table 3), as well as country fixed effects.

Table 4: Survey design and non response rates - I

	(1)	(2)	(3)	(4)	(5)	(6)
Number of questions	0.077*** (0.001)	0.120*** (0.001)	0.033*** (0.002)	0.047*** (0.002)	0.043*** (0.002)	0.043*** (0.002)
Number of questions squared	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Weekend dummy		0.035*** (0.012)	-0.017* (0.009)	-0.011 (0.014)	-0.007 (0.014)	-0.007 (0.014)
Middle of the month dummy		0.059*** (0.011)	-0.063*** (0.009)	-0.110*** (0.012)	-0.071*** (0.012)	-0.073*** (0.012)
End of the month dummy		0.983*** (0.012)	0.027** (0.013)	-0.055*** (0.017)	0.031* (0.017)	0.032* (0.017)
Second quarter of year dummy		0.554*** (0.016)	-0.235*** (0.012)	-0.484*** (0.029)	0.099*** (0.037)	0.097*** (0.037)
Third quarter of year dummy		-0.055*** (0.014)	-0.239*** (0.009)	-0.451*** (0.072)	-0.103 (0.069)	-0.103 (0.070)
Fourth quarter of year dummy		0.034*** (0.010)	0.015** (0.008)	0.053*** (0.011)	0.065*** (0.011)	0.065*** (0.011)
Urban dummy			-0.034*** (0.008)	-0.043*** (0.012)	-0.021* (0.012)	-0.020* (0.012)
Interviewer different gender dummy				0.017* (0.010)	0.013 (0.010)	0.013 (0.010)
Male interviewer dummy				-0.024** (0.011)	-0.007 (0.011)	-0.006 (0.011)
Interviewer's skin color					0.013*** (0.004)	0.012*** (0.004)
Different skin color dummy					0.051*** (0.010)	
Absolute difference in skin color						0.022*** (0.004)
Constant	-5.396*** (0.083)	-10.242*** (0.131)	-3.389*** (0.163)	-3.034*** (0.251)	-3.205*** (0.255)	-3.216*** (0.256)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Database Fixed Effects	Yes	Yes	-	-	-	-
Observations	460,599	379,501	128,064	86,797	85,120	84,919
R-squared	0.258	0.253	0.134	0.114	0.115	0.115

Note: Dependent variable is the share of questions not responded by each individual. Individual controls include age, age squared, male dummy, literacy dummy, maximum educational attainment dummies, access to running water and asset ownership dummies (fridge, computer, washing machine, landline, car and TV). ***, ** and * denote significance at 10%, 5% and 1% levels, respectively, calculated using robust standard errors.

Column (1) of Table 4 presents the results controlling for the number of questions the respondent got asked, including a quadratic term while column (3) includes dummy variables controlling for the date when the survey was conducted. This is the only set of survey related variables that both databases have in common. Columns (3)-(6) of Table 4 include variables only available in LAPOP. Column (3) incorporates a dummy for urban residence, column (4) controls for the gender of the interviewer and whether the interviewer has a different gender than the respondent and columns (5) and (6) control for the interviewer's skin color and whether the self-reported skin color of the respondent is different from the interviewer.

The results for the number of questions are in line with the intuition: lengthier surveys are associated with higher non-response rates, although the effect is not linear. On average, 10 additional items in the survey increase non-response rates in about one percentage point.

Conducting the interview during the middle of the month (days 11-20) tends to yield lower non-response rates than in the beginning of it (days 1-10), while the end of the month (days 20-31) has mixed results compared to the beginning of it. Similarly, the third quarter of the year tends to correlate negatively with non-response rates, compared to the first quarter, while the fourth quarter on average has higher non-response rates. Whether surveys are conducted on weekends doesn't seem to make a difference.

Results also suggest that urban areas have, on average, higher response rates. Interviewer's gender doesn't seem to robustly correlate with response rates, neither the fact that the interviewer has a different sex than the respondent. However, the skin color seems to matter: both interviewer's skin color and differences in skin color between the respondent and the interviewer are statistically significant (see Annex 1 for further details about this variable). Indeed, either measured by plainly having a different skin color (column 5) or the absolute difference in the scale (column 6), this variable is associated with higher non-response rates. In other words, the further away the interviewer reports being from the respondent in terms of skin color, the higher the response rates from such survey. In line with this result, interviewer's with darker reported skin colors correlate with higher non-response rates.

Table 5: Survey design and non response rates - II

	(1)	(2)	(3)	(4)	(5)	(6)
Number of questions	0.072*** (0.007)	0.072*** (0.007)	0.081*** (0.007)	-1.122*** (0.055)	-1.123*** (0.055)	-1.116*** (0.055)
Number of questions squared	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)
Weekend dummy	0.038** (0.019)	0.038** (0.019)	0.043** (0.019)	0.025 (0.033)	0.028 (0.033)	0.022 (0.033)
Middle of the month dummy	-0.021 (0.021)	-0.023 (0.021)	-0.029 (0.022)	0.152*** (0.054)	0.157*** (0.054)	0.174*** (0.054)
End of the month dummy	-0.194*** (0.024)	-0.193*** (0.024)	-0.200*** (0.024)	-0.200*** (0.039)	-0.207*** (0.039)	-0.155*** (0.039)
Third quarter of year dummy	-0.671*** (0.028)	-0.675*** (0.028)	-0.673*** (0.028)	-3.180*** (0.164)	-3.165*** (0.164)	-3.112*** (0.164)
Fourth quarter of year dummy	-1.196*** (0.028)	-1.205*** (0.028)	-1.207*** (0.028)			
Survey between 11am to 13pm	0.039 (0.025)	0.040* (0.025)	0.034 (0.025)	-0.048 (0.044)	-0.043 (0.044)	-0.028 (0.044)
Survey between 14pm to 15pm	0.080*** (0.027)	0.080*** (0.027)	0.079*** (0.027)	0.005 (0.048)	0.005 (0.048)	0.027 (0.048)
Survey between after 4pm	0.075*** (0.026)	0.076*** (0.026)	0.076*** (0.026)	-0.016 (0.046)	-0.015 (0.046)	0.005 (0.046)
Questionnaire was in non-native language		0.608*** (0.054)	0.615*** (0.054)	1.221*** (0.109)	1.221*** (0.109)	1.204*** (0.110)
Duration of the interview (minutes)			-0.010*** (0.001)	-0.017*** (0.001)	-0.018*** (0.001)	-0.018*** (0.001)
Perception of the interview as very long				-0.107*** (0.038)	-0.095** (0.037)	-0.103*** (0.037)
Perception of the interview as very deep				0.116*** (0.037)	0.136*** (0.037)	0.145*** (0.037)
Interviewer had difficulties asking some q's					0.411*** (0.060)	0.422*** (0.060)
Respondent got upset about some q's					-0.023 (0.060)	-0.041 (0.060)
Size city: 20,001 - 50,000 inhabitants						-0.209** (0.087)
Size city: 50,001 - 100,000 inhabitants						-0.111 (0.083)
Size city: 100,001 - 300,000 inhabitants						-0.322*** (0.077)
Size city: 300,001 - 700,000 inhabitants						-0.600*** (0.102)
Size city: 700,001 - 1,000,000 inhabitants						-0.347*** (0.078)
Size city: 1,000,001 - 2,000,000 inhabitants						-0.487*** (0.060)
Size city: 2,000,000 and more inhabitants						-0.613*** (0.060)
Constant	2.259** (0.931)	2.147** (0.931)	1.339 (0.940)	170.373*** (7.833)	170.470*** (7.833)	169.535*** (7.817)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	170,260	170,260	168,994	54,581	54,581	54,581
R-squared	0.176	0.177	0.178	0.214	0.215	0.217

Note: Dependent variable is the share of questions not responded by each individual. Individual controls include age, age squared, male dummy, literacy dummy, maximum educational attainment dummies, access to running water and asset ownership dummies (fridge, computer, washing machine, landline, car and TV). ***, ** and * denote significance at 10%, 5% and 1% levels, respectively, calculated using robust standard errors.

Table 5 shows the results of the regressions that include variables available only in Latinobarómetro.

Consistent with previous findings, the number of questions is positively associated with non-response rates, except in the last three specifications which could be noise due to a relatively small sample size. Weekends seem worse days than weekdays to conduct interviews, even after controlling for observable individual characteristics. The first days of the month seem to have higher non-response rates compared to the end of the month and the second half of the year has, on average, higher response rates than the beginning of the year. Compared to the morning, interviews conducted after 14pm have on average lower response rates.

Others aspect of the survey design seem to matter as well. For instance, questionnaires in languages other than respondent's native language yield on average, lower response rates. The reported duration of the interview in time doesn't seem to affect negatively the response rates, if anything, it's negatively associated with non-response rates, although the size of the coefficient is very small: it would require over an hour and a half to decrease the non-response rate by one percentage point.

Interestingly, the surveys with the higher response rates are those in which the respondent thought the interview was very long. Conversely, the surveys that interviewees reported as very deep, are associated with higher non-response rates. In those surveys in which the interviewer had difficulties or felt uncomfortable asking some of the questions, the response rates were lower as well. It's noteworthy that, the perception of the interviewer of whether the interviewee found any of the questions offensive, too intrusive or indiscrete to be answered doesn't seem to correlate with response rates. Finally, analog to the result of urbanization, larger cities tend to correlate negatively with non-response rates.

In short, the results from this section point that the architecture behind the design of the survey (such as the time of the day, and the day itself the survey will be conducted) influence response rates. Other factors under the control of the institution designing the survey seem important as well: the language of the survey and the expectations of the interviewee about the length and deepness of the survey. The results also point there is a trade off between additional questions

in the survey and item response rate.

4.3 Are certain type of questions less likely to be responded?

So far we have seen that response rates depend on both respondent’s characteristics and on the design of the survey. While, on average, the response rates are high, this doesn’t imply they are uniformly high along all the sections of the survey. In this section I explore if some type of variables are less likely to be answered. In this case I estimate (2) using question level data. ⁵

Table A2 from the Appendix A shows the main results. Sociodemographic variables are chosen as the base category in all the specifications. Columns (1) through (3) use category fixed effects. Column (1) is a plain regression of non-response rates on type of question dummies, column (2) adds time fixed effects and column (3) both time and country fixed effects. Columns (4) through (6) use subcategory fixed effects, column (5) and (6) incorporate fixed effects controls.

Since results are similar across specifications, for simplicity, Figure 1 synthesizes the coefficients from the specifications of columns (3) and (6) -the ones that include year and country fixed effects-.

As can be seen from the figure, not all type of questions are the same. The mean response rate of the different categories of questions is statistically different from the response rate of the sociodemographic variables. This result is in line with those of Bollinger and Hirsch (2006), who find that non-response rates are typically low for most questions but they can be quite high for some particular categories.

In particular, questions related with the economy are more prone to be answered than sociodemographic questions, which turns to the notion that “everyone has an economist deep down”. On the other hand, questions on current issues are negatively associated with response rates.

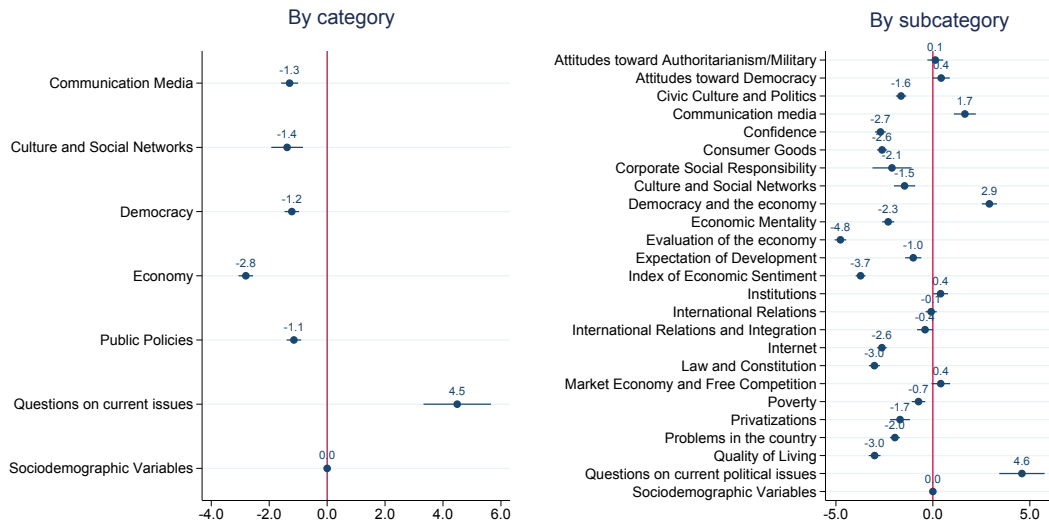
The results are consistent with the specifications using more desegregation of each category (columns 4-6). When subcategory dummies are used, again the questions of current issues are the type of questions with the highest non-response rates (on average, over 4 percentage points higher than sociodemographic variables),

⁵Table 2 shows the different categories and subcategories as well as the number of observations and questions for each category.

and the questions on evaluation of the economy the one with the highest response rates (almost five percentage points higher than sociodemographic questions, on average).

Again, there is a great deal of heterogeneity across categories: out of the 24 subcategories dummies, 22 are statistically different from zero at 10% (out of which 18 are statistically different at 1%). Questions related with the economy such as “Economic Mentality” or “Problems in the country” have consistently lower response rates while others less related -such as “Communication media”- have lower response rates.

Figure 1: Non response rates and category of questions



Note: Figure shows the coefficient of a regression where the dependent variable is the share of individuals that didn't respond each particular question and the regressors are dummy variables for the different categories and subcategories assigned to each question. Sociodemographic questions are used as based category in both cases. Horizontal lines denote confidence intervals at 95% calculated using robust standard errors. Both regressions include country and year fixed effects. The number of questions (observations) in both cases is 87,664. Source: Own elaboration based on Latinobarómetro.

The reasons behind non-responses are probably different depending on the types of questions. For instance Groves and Couper (1998) suggest that the most important factor behind non-response are concerns about confidentiality in the case of income related variables, although lack of knowledge is also important. The theory of insufficient knowledge from respondents is also consistent with the relatively high non-response rates on current issues.

As a robustness check I consider the subsample of questions with relatively large missing rates (i.e., those in the right tail of the non-response distribution, as defined by being in the 90th percentile or above). Table A3 from the Appendix presents the results. The same results hold for all specifications, if anything, the differences across categories are larger.

5 Conclusions

Surveys are perhaps the most important tool of social science research. Their vast uses range from informing “data driven” policy making to targeting of social programs. Since survey results have such a high stakes when it comes to decision making, their quality shouldn’t be taken from granted. Indeed, if the survey is used to estimate indicators from questions that a specific part of the population chooses not to answer, then the indicators are not going to be representative from such population and any conclusion derived from that data should be taken with a grain of salt.

This paper contributed to understanding what is behind non-response rates, and hinted about some ways to improve response rates by changing the architecture design of surveys. In particular, I found that individual’s attributes are helpful to predict response rates, and that relatively younger, less educated, single and poorer populations have on average higher non-response rates.

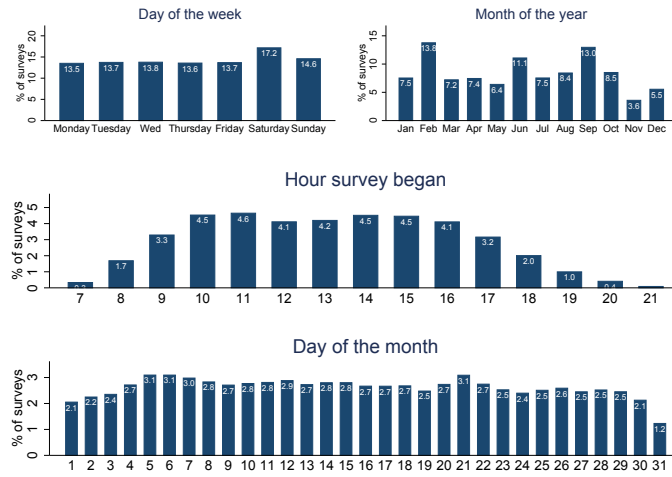
I also found some ways in which the institution in charge of designing the survey can improve the item response rates. In particular, ensuring the questionnaire’s language corresponds with the respondent’s language, shortening the questionnaires and conducting the interviews strategically in terms of dates.

Finally, I found that response rates are not random in terms of the types of questions, but there are some categories with systematically higher non-response rates.

Appendix A. Additional Figures and Tables

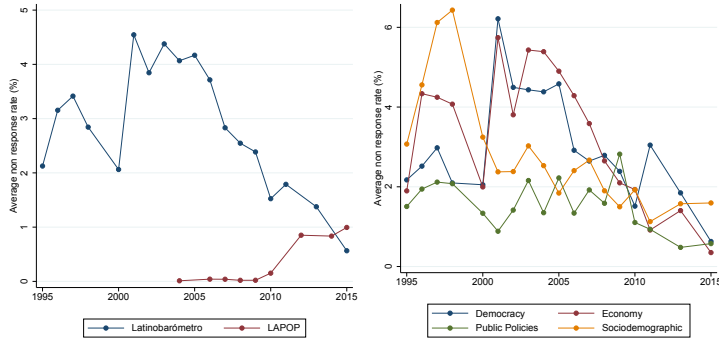
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Figure A1. Distribution of surveys across time



Source: Own elaboration based on Latinobarómetro and LAPOP data.

Figure A2. Evolution of non response rates overtime



Source: Own elaboration based on Latinobarómetro and LAPOP data.

Table A1. Data availability in LAPOP and Latinobarómetro

Variable	Availability	Observations		
		LAP	LAT	Total
<i>Sociodemographic variables</i>				
Age of respondent	LAP: 2004, 2006-2010, 2012, 2014-2015; LAT: 1995-2011, 2013, 2015	194,879	411,170	606,049
Catholic religion dummy	LAP: 2004, 2006-2010, 2012, 2014-2015; LAT: 1995-2011, 2013, 2015	197,078	405,472	602,550
Marital status dummy	LAP: 2004, 2006-2010, 2012, 2014-2015; LAT: 1995-2011, 2013, 2015	148,616	408,301	556,917
Respondent's native language	LAT: 2002-2011, 2013, 2015	0	258,905	258,905
Education attainment	LAP: 2004, 2006-2010, 2012, 2014-2015; LAT: 1995-2011, 2013, 2015	191,427	393,971	585,398
Gender	LAP: 2004, 2006-2010, 2012, 2014-2015; LAT: 1995-2011, 2013, 2015	197,077	411,198	608,275
Self-reported ideology index	LAP: 2004, 2006-2010, 2012, 2014 ; LAT: 1995-2011, 2013, 2015	133,790	320,355	454,145
Literacy dummy	LAP: 2004, 2006-2010, 2012, 2014-2015; LAT: 1995-2011, 2013, 2015	191,427	393,971	585,398
Self reported-economic class	LAP: 2007, 2012, 2014; LAT: 2011, 2013, 2015	18,599	83,873	102,472
<i>Regional variables</i>				
Country	LAP: 2004, 2006-2010, 2012, 2014-2015; LAT: 1995-2011, 2013, 2015	197,078	411,241	608,319
Municipality	LAP: 2004, 2006-2010, 2012, 2014-2015	197,078	0	197,078
Province	LAP: 2004, 2006-2010, 2012, 2014-2015	182,532	0	182,532
Geographical region	LAP: 2006-2008; LAT: 1995-2011, 2013, 2015	5,076	366,044	371,120
Size of the city	LAT: 2001-2011, 2013, 2015	0	299,404	299,404
Dummy for urban area	LAP: 2004, 2006-2010, 2012, 2014-2015	192,336	0	192,336
<i>Access to services and asset ownership</i>				
Access to running water	LAP: 2004, 2006-2010, 2012, 2014-2015; LAT: 1995-2011, 2013	192,095	354,233	546,328
Access to a sewage	LAP: 2007, 2012, 2014-2015; LAT: 1995-2011, 2013, 2015	66,665	372,816	439,481
Car ownership	LAP: 2004, 2006-2010, 2012, 2014-2015; LAT: 1995-2011, 2013, 2015	191,941	403,225	595,166
Computer ownership	LAP: 2004, 2006-2010, 2012, 2014-2015; LAT: 1995-2011, 2013, 2015	189,043	403,795	592,838
Fridge ownership	LAP: 2004, 2006-2010, 2012, 2014-2015; LAT: 1995-2011, 2013	192,100	381,927	574,027
Homeowner dummy	LAP: 2010; LAT: 1997-2011, 2013, 2015	4,037	377,079	381,116
Landline ownership	LAP: 2004, 2006-2010, 2012, 2014-2015; LAT: 1995-2011, 2013, 2015	187,696	405,278	592,974
Mobile ownership	LAP: 2014; LAT: 2005-2011, 2013, 2015	1,457	217,442	218,899
Phone ownership	LAP: 2004, 2006-2010, 2012, 2014-2015; LAT: 1995-2011, 2013, 2015	78,849	324,418	403,267
TV ownership	LAP: 2004, 2006-2010, 2012, 2014-2015; LAT: 1995-2010	192,150	322,189	514,339
Washing machine ownership	LAP: 2004, 2006-2010, 2012, 2014-2015; LAT: 1995-2011, 2013, 2015	192,106	405,121	597,227
<i>Labor market variables</i>				
Employed dummy	LAP: 2007-2010, 2012, 2014-2015; LAT: 1995-2011, 2013, 2015	126,083	403,519	529,602
Economically active dummy	LAP: 2007-2010, 2012, 2014-2015; LAT: 1995-2011, 2013, 2015	126,828	403,519	530,347
Type of employment	LAP: 2007-2010, 2012, 2014-2015; LAT: 1995-2011, 2013, 2015	82,290	252,408	334,698
Unemployed dummy	LAP: 2007-2010, 2012, 2014-2015; LAT: 1995-2011, 2013, 2015	126,828	403,519	530,347
Wage earner dummy	LAP: 2006-2010, 2012, 2014-2015; LAT: 1995-2011, 2013, 2015	78,959	225,935	304,894
<i>Interview related variables</i>				
Id interviewer	LAT: 1996-2011, 2013, 2015	0	352,109	352,109
Id supervisor	LAT: 2002-2011, 2013, 2015	0	163,134	163,134
Id data entry	LAT: 1997-2011, 2013, 2015	0	312,415	312,415
Interviewer's gender	LAP: 2007, 2010, 2012, 2014-2015	99,380	0	99,380
Interview's language	LAP: 2004, 2006-2010, 2012, 2014-2015; LAT: 2002-2011, 2013, 2015	186,232	261,388	447,620
Skin color of interviewer	LAP: 2007, 2010, 2012, 2014-2015	97,607	0	97,607
Skin color of respondent	LAP: 2007, 2010, 2012, 2014-2015	97,359	0	97,359
Time beginning interview	LAT: 2002-2011, 2013, 2015	0	271,300	271,300
Time end interview	LAT: 2002-2011, 2013, 2015	0	273,784	273,784
Day when interview was conducted	LAP: 2004, 2006-2010, 2012, 2014-2015; LAT: 1997-2011, 2013, 2015	135,256	354,593	489,849
Month when interview was conducted	LAP: 2004, 2006-2010, 2012, 2014-2015; LAT: 1997-2011, 2013, 2015	135,256	354,887	490,143
Number of questions asked	LAP: 2004, 2006-2010, 2012, 2014-2015; LAT: 1995-2011, 2013, 2015	197,078	411,241	608,319
Number of questions not responded	LAP: 2004, 2006-2010, 2012, 2014-2015; LAT: 1995-2011, 2013, 2015	197,078	411,241	608,319
Duration of the interview	LAT: 1997-2011, 2013, 2015	0	366,682	366,682
Perception of interview depth	LAT: 1997-2004	0	145,184	145,184
Perception of interview duration	LAT: 1997-2011, 2013, 2015	0	350,507	350,507
Difficulty of asking democracy q's	LAT: 1997-2011, 2013	0	312,445	312,445
Difficulty of asking economics q's	LAT: 1997-2011, 2013	0	312,487	312,487
Difficulty of asking environm. q's	LAT: 1997-2008	0	234,880	234,880
Difficulty of asking int. affairs q's	LAT: 1997-2011, 2013	0	312,433	312,433
Difficulty of asking politics q's	LAT: 1997-2011, 2013	0	312,565	312,565
Difficulty of asking sociodem. q's	LAT: 1997-2011, 2013	0	312,430	312,430
Interviewer upset the democracy q's	LAT: 1997-2008	0	234,880	234,880
Interviewer upset the economics q's	LAT: 1997-2008	0	234,880	234,880
Interviewer upset the environment q's	LAT: 1997-2008	0	234,880	234,880
Interviewer upset the int. affairs q's	LAT: 1997-2008	0	234,880	234,880
Interviewer upset the politics q's	LAT: 1997-2008	0	234,880	234,880
Interviewer upset the sociodem. q's	LAT: 1997-2008	0	234,880	234,880

Note: "LAP" refers to LAPOP and "LAT" to Latinobarómetro.

Table A2. Question-level determinants of non response rates

	(1)	(2)	(3)	(4)	(5)	(6)
Communication Media	-1.94*** (0.157)	-1.29*** (0.151)	-1.30*** (0.150)			
Culture and Social Networks	-2.90*** (0.272)	-1.38*** (0.276)	-1.38*** (0.279)			
Democracy	-1.27*** (0.133)	-1.22*** (0.128)	-1.22*** (0.128)			
Economy	-2.62*** (0.129)	-2.80*** (0.128)	-2.81*** (0.128)			
Public Policies	-1.20*** (0.134)	-1.14*** (0.129)	-1.15*** (0.129)			
Questions on current issues	3.78*** (0.595)	4.51*** (0.595)	4.49*** (0.594)			
Attitudes toward Authoritarianism				-0.05 (0.213)	0.13 (0.209)	0.13 (0.208)
Attitudes toward Democracy				-0.12 (0.233)	0.43* (0.228)	0.43* (0.227)
Civic Culture and Politics				-1.61*** (0.140)	-1.64*** (0.136)	-1.64*** (0.135)
Communication media				1.94*** (0.289)	1.65*** (0.290)	1.65*** (0.289)
Confidence				-2.57*** (0.146)	-2.71*** (0.143)	-2.70*** (0.142)
Consumer Goods				-2.56*** (0.135)	-2.62*** (0.133)	-2.62*** (0.132)
Corporate Social Responsibility				-0.71 (0.502)	-2.10*** (0.520)	-2.11*** (0.513)
Culture and Social Networks				-2.90*** (0.272)	-1.46*** (0.275)	-1.46*** (0.278)
Democracy and the economy				3.40*** (0.205)	2.92*** (0.205)	2.92*** (0.199)
Economic Mentality				-2.05*** (0.155)	-2.30*** (0.161)	-2.30*** (0.159)
Evaluation of the economy				-3.83*** (0.130)	-4.76*** (0.152)	-4.77*** (0.152)
Expectation of Development				-0.64*** (0.209)	-1.00*** (0.215)	-1.01*** (0.213)
Index of Economic Sentiment				-3.65*** (0.130)	-3.73*** (0.129)	-3.73*** (0.129)
Institutions				0.37* (0.202)	0.40** (0.198)	0.40** (0.197)
International Relations				-0.11 (0.153)	-0.09 (0.148)	-0.09 (0.148)
International Integration				-0.85*** (0.206)	-0.40* (0.209)	-0.40* (0.209)
Internet				-3.70*** (0.136)	-2.62*** (0.126)	-2.63*** (0.126)
Law and Constitution				-2.65*** (0.142)	-3.01*** (0.146)	-3.01*** (0.145)
Market Economy and Free Competition				0.42* (0.252)	0.41* (0.246)	0.41* (0.244)
Poverty				-0.66*** (0.180)	-0.74*** (0.179)	-0.74*** (0.177)
Privatizations				-1.78*** (0.262)	-1.69*** (0.260)	-1.69*** (0.261)
Problems in the country				-2.10*** (0.137)	-1.96*** (0.131)	-1.96*** (0.131)
Quality of Living				-3.15*** (0.145)	-3.00*** (0.156)	-3.00*** (0.155)
Questions on current issues				3.78*** (0.595)	4.61*** (0.596)	4.59*** (0.595)
Constant	4.34***	3.97***	4.06***	4.34***	3.79***	3.89***
Year Fixed Effects	No	Yes	Yes	No	Yes	Yes
Country Fixed Effects	No	No	Yes	No	No	Yes
Questions (N)	87,664	87,664	87,664	87,664	87,664	87,664
R-squared	0.008	0.031	0.036	0.029	0.051	0.056

Note: Dependent variable is the share of individuals that didn't respond each particular question. ***, ** and * denote significance at 10%, 5% and 1% levels, respectively, calculated using robust standard errors.

Table A3. Robustness check: High non response rates

	(1)	(2)	(3)	(4)	(5)	(6)
Communication Media	-3.22*** (0.830)	-2.54*** (0.846)	-2.51*** (0.846)			
Culture and Social Networks	-3.65 (8.102)	-0.51 (8.180)	-0.22 (8.212)			
Democracy	-3.37*** (0.627)	-2.25*** (0.592)	-2.13*** (0.599)			
Economy	-10.72*** (0.579)	-8.99*** (0.588)	-8.85*** (0.595)			
Public Policies	-5.84*** (0.619)	-5.28*** (0.611)	-5.22*** (0.609)			
Questions on current issues	-4.66*** (1.009)	3.53*** (1.017)	3.58*** (1.017)			
Attitudes toward Authoritarianism				-12.04*** (0.644)	-8.19*** (0.697)	-8.12*** (0.714)
Attitudes toward Democracy				2.08 (1.495)	3.51** (1.442)	3.66** (1.450)
Civic Culture and Politics				-4.44*** (0.760)	-2.66*** (0.729)	-2.55*** (0.734)
Communication media				-2.57*** (0.932)	-2.66*** (0.957)	-2.62*** (0.956)
Confidence				0.79 (1.388)	1.28 (1.445)	1.52 (1.444)
Consumer Goods				-9.00*** (0.746)	-9.98*** (0.802)	-9.59*** (0.838)
Corporate Social Responsibility				-8.60*** (1.035)	-6.55*** (1.153)	-6.46*** (1.179)
Culture and Social Networks				-3.65 (8.111)	0.06 (8.180)	0.35 (8.205)
Democracy and the economy				-12.53*** (0.564)	-11.21*** (0.708)	-11.06*** (0.719)
Economic Mentality				-12.14*** (0.719)	-9.32*** (0.898)	-9.25*** (0.904)
Evaluation of the economy				-13.99*** (0.755)	-15.59*** (0.911)	-15.68*** (0.974)
Expectation of Development				-12.04*** (0.603)	-8.40*** (0.654)	-8.38*** (0.669)
Index of Economic Sentiment				-9.48*** (1.544)	-11.40*** (1.667)	-11.31*** (1.633)
Institutions				-2.28*** (0.800)	-2.28*** (0.827)	-2.22*** (0.831)
International Relations				-3.19*** (0.696)	-2.67*** (0.704)	-2.59*** (0.702)
International Integration				2.98** (1.222)	0.73 (1.013)	0.84 (1.021)
Internet				-5.74*** (1.024)	-1.70 (1.129)	-1.78 (1.158)
Law and Constitution				-10.47*** (0.818)	-10.53*** (1.004)	-10.35*** (1.014)
Market Economy and Free Competition				-10.88*** (0.705)	-9.49*** (0.825)	-9.42*** (0.836)
Poverty				-10.89*** (0.595)	-10.77*** (0.662)	-10.77*** (0.673)
Privatizations				-10.10*** (2.390)	-8.19*** (2.421)	-7.98*** (2.428)
Problems in the country				-7.91*** (0.748)	-7.08*** (0.759)	-7.04*** (0.759)
Quality of Living				-11.49*** (0.917)	-5.68*** (0.986)	-5.67*** (0.990)
Questions on current issues				-4.66*** (1.010)	2.95*** (1.027)	2.98*** (1.024)
Constant	23.49*** (0.536)	26.67*** (2.247)	27.42*** (2.418)	23.49*** (0.537)	26.45*** (2.265)	27.24*** (2.432)
Year Fixed Effects	No	Yes	Yes	No	Yes	Yes
Country Fixed Effects	No	No	Yes	No	No	Yes
Questions (N)	8,766	8,766	8,766	8,766	8,766	8,766
R-squared	0.021	0.076	0.082	0.057	0.101	0.107

Note: Dependent variable is the share of individuals that didn't respond each particular question. ***, ** and * denote significance at 10%, 5% and 1% levels, respectively, calculated using robust standard errors.

Appendix B. Construction of skin color variable

The construction of the skin color variable is based on Figure B.1 color chart. After the interview is complete, the interviewer uses the palette and circles the number closest to what she think is respondent's skin and her own skin color.

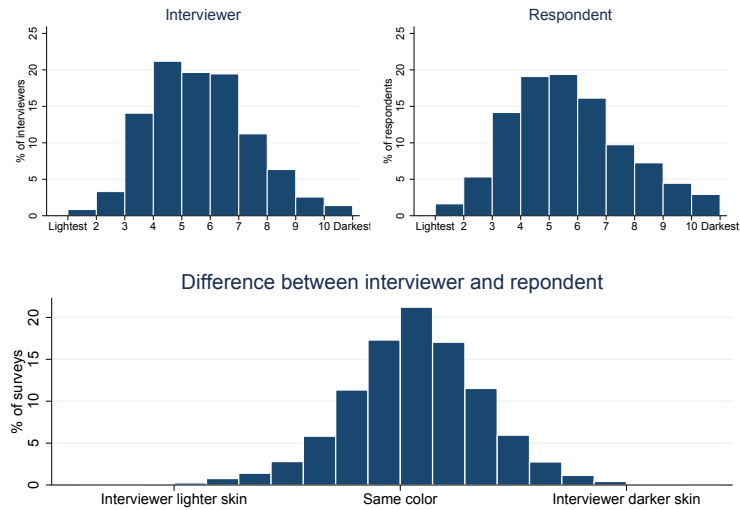
Figure B.1 Color palette used on LAPOP's questionnaires



Source: LAPOP 2014 Master Questionnaire.

Figure B.2 shows the histogram of skin colors of both the interviewer, the respondent and the difference of both. The mean value of both distributions is the same (5.2), however, respondent's distribution presents a larger variability (the standard deviation is 2.1) than interviewers distribution (1.8).

Figure B.2 Histogram of reported skin colors



Source: Own elaboration based on LAPOP.

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