Journal of Economic Psychology 90 (2022) 102510

Contents lists available at ScienceDirect

Journal of Economic Psychology

journal homepage: www.elsevier.com/locate/joep

Anchors matter: Eliciting maternal expectations on educational outcomes☆

Pablo Brañas-Garza [a], Riccardo Ciacci [b,*], Ericka G. Rascón Ramírez [c]

[a] Universidad Loyola Andalucía, LoyolaBehLAB & Department of Economics, Spain
[b] Universidad Pontificia Comillas, Faculty of Economics and Business, Spain
[c] Middlesex University London, United Kingdom

ARTICLE INFO

Keywords:
Expectations on education
Survey design
Order effects
Anchoring
Beliefs

ABSTRACT

Subjective expectation data on education has been increasingly used by social scientists to better understand current investments in human capital. Despite its recognised value by scholars, there is little evidence about how the elicitation of such data might be sensitive to questionnaire design. Using a 2 × 2 between-subjects experimental design, we analyse how sensitive the elicitation of subjective expectation data on educational outcomes is to anchors. Our study provides *causal* evidence on whether collecting data on parental education before the elicitation of parental expectations on their children's educational outcomes anchors the elicitation of the latter; and whether parental expectations on their older offsprings anchors their expectations on their younger children. We find that mothers (main respondents) who have been exposed to the *anchored* treatments report more pessimistic parental expectations. When splitting our sample into low and high educated mothers, we find that low educated mothers who have been allocated to anchored treatments are more likely to report lower levels of education than those in the *non-anchored* treatment. Anchored treatments also increase non-response in both high and low educated mothers, however, the effect is larger on the former. When assessing the accuracy of expectations to predict educational outcomes, we observe that anchored expectations have higher predictive power. Our findings inform to what extent the collection of subjective expectations data is subject to anchoring and which type of elicitation (*anchored* or *non-anchored*) should be considered according to the main purpose of the elicitation (i.e., item response vs prediction).

1. Introduction

Subjective expectation data on educational outcomes have been increasingly used in experimental (Bleemer & Zafar, 2018; Wiswall & Zafar, 2014) and observational studies (Attanasio & Kaufmann, 2014; Cunha et al., 2013; Goyette, 2008; Reynolds & Pemberton, 2001; Wilson et al., 2005; Zafar, 2011, 2013) to explain and predict educational outcomes. What parents expect about the future of their children determines current investments in human capital, and therefore future educational choices. Elicitation of these data entails the assessment of observing certain events to happen in the future. Data collection on expected educational

☆ We thank the editor and two anonymous reviewers for their helpful suggestions. We also thank Balint Lenkei for his excellent data preparation and preliminary analysis, as well as Andreas Murr for his comments on previous versions. This project was funded by Middlesex University, United Kingdom (MUL-102027). Financial support from Spanish Ministry of Science (PGC2018-093506-B-I00) and Excelencia Andalucía, Spain (PY18-FR-0007, P12-SEJ-1436) are gratefully acknowledged. The dataset and Stata code to replicate the analysis of this paper is available at https://data.mendeley.com/datasets/5fkp7tngrf/1.

* Corresponding author.
E-mail addresses: branasgarza@gmail.com (P. Brañas-Garza), rciacci@comillas.edu (R. Ciacci), e.ramirez@mdx.ac.uk (E.G.R. Ramírez).

https://doi.org/10.1016/j.joep.2022.102510
Received 18 November 2020; Received in revised form 15 February 2022; Accepted 18 March 2022
Available online 2 April 2022
0167-4870/© 2022 Elsevier B.V. All rights reserved.

outcomes may take different forms. Common measures are on the perceived chances of observing such events (e.g., how likely is that your child will finish higher education?), as well as on the expected outcomes that are more likely to happen (e.g., what is the highest level of education your child will achieve?). The relevance of these data, as outcome of interest and explanatory variable, is unquestionable. However, little is known about how sensitive these data are to questionnaire design. In this study we focus on the second type of measure, that is, on the expected outcomes reported by mothers that are more likely to happen.

How do people make assessments about the most likely outcome? One strategy is to use information one does know and then adjust until an acceptable value or event is reached, also known as anchoring-and-adjustment by Tversky and Kahneman (1974). According to Epley and Gilovich (2001, 2004), people adjust from values they generate themselves as starting points known to be incorrect but close to the target value. When asking people about uncertain events, anchoring can then be used as a shortcut to make an assessment of how likely is to observe such events in the future. Evidence outside of the education field has revealed that anchors may influence assessments of asset values (Hurd, 1998; Ünveren & Baycar, 2019), buyer–seller negotiations (Jiang & Ma, 2019; Maaravi & Levy, 2017; Mason et al., 2013), perceptions of deaths by type of risk (Armantier, 2006) and decision making for others (Ifcher & Zarghamee, 2020): these anchoring effects may depend on the respondents' level of knowledge (Wilson et al., 1996). More generally, evidence on reference-dependence is found in offers and counteroffers (Kimbrough et al., 2021) and lying (Fochmann et al., 2021), among others.

This paper studies whether the elicitation of subjective expectations about educational outcomes varies according to the previous exposure to different sources and levels of anchoring. In particular, we test whether the expectations reported by mothers on the highest educational qualification attained by their children are affected by anchoring. To do so, we designed a survey experiment where our participants were subject to variations of exposure to self-reported anchors produced by the mothers but induced by the experimenter. This was done by randomly allocating different question order of parental education, before or after, the elicitation of educational expectations about children.

Our study contributes to the line of research on context effects on survey responses, as well as on the recent strand of the literature studying anchoring and biases on survey responses.[1] The influence of the context outlined by previous questions on subsequent survey responses has been found in a variety of applications such as abortion (Schuman et al., 1981), consumer behaviour (Herr, 1989) and donations (Schwarz & Hippler, 1995) questions.

Our experiment constitutes a 2 × 2 between-subjects design where the variations in order creates four treatments. The *no-anchoring* treatment (the purest one exposed to no anchoring at all) corresponds to the elicitation of educational expectations for the youngest child, followed by the elicitation of the second oldest, and so on. Parental education is collected after the expectations of the oldest child has been elicited. In this way, the main respondent (the mother) is not anchored with any prior schooling-related information when the elicitation of the youngest child takes place. Conversely, the treatment with *double-anchoring* (the one exposed to the highest level of anchoring in our experiment) asks mothers about her level of education first, including her partners', followed by the elicitation of their educational expectations for their oldest child and continues the elicitation in descending order based on the age of the children living in the household. Thus, in this treatment, we finalise the educational module with the elicitation of educational expectations for the youngest child. Our experiment also includes two *single-anchoring* treatments where the educational expectations for the youngest child are exposed to a prior anchor self-generated by either parental education or the educational expectations for older children.

To the best of our knowledge, the majority of surveys collecting expectations about educational choices position the collection of parental education *prior* to the elicitation of parental expectations on future educational outcomes (e.g., Mexico: Jovenes con Oportunidades — previously known as *Progresa*, Mexican Life Survey (*MxFLS*); US: National Longitudinal Survey of Youth (*NLSY*), Parent and Family Involvement in Education (*PFI*), among others). Exceptions are the UK Longitudinal Survey for Young People in England (*LSYPE*) and the US National Education Longitudinal Study (*NELS*) where parental education is collected *after* the set of parental expectations on their teenagers' educational choices. Unfortunately, regarding birth order, most of the surveys do not explicitly specify whether parental expectations were firstly elicited for the oldest or youngest child. An exception is the *LSYPE* where we can identify that the information about siblings aged 16 or over who *completed continuous full-time education* was collected *prior* to the elicitation of parental expectations on the younger siblings.

Understanding how sensitive these data are to questionnaire order allows us to: (a) assess comparability of parental schooling and expectations data when collected by different sources following variations in question order, (b) assess comparability over time for the same survey, and (c) assess which type of elicitation of expectation is more likely to report more realistic outcomes and, therefore, more likely to be better predictors of future behaviour. As suggested by our findings, ignoring potential anchoring effects may increase item non-response or may affect the predictive power of expectations data. In the next section, we present our experimental design followed by a description of our data. We then discuss our main findings.

2. Experimental design

Our survey design allows us to evaluate whether anchoring affects **subjective expectations reported by mothers about the highest educational qualification that might be attained** by each child living in the household. In our experiment, self-anchoring is induced by randomly allocating different question order of parental education and educational expectations. The participants were randomly assigned to four treatments which varied on two main features: (*i*) whether parental education was collected before

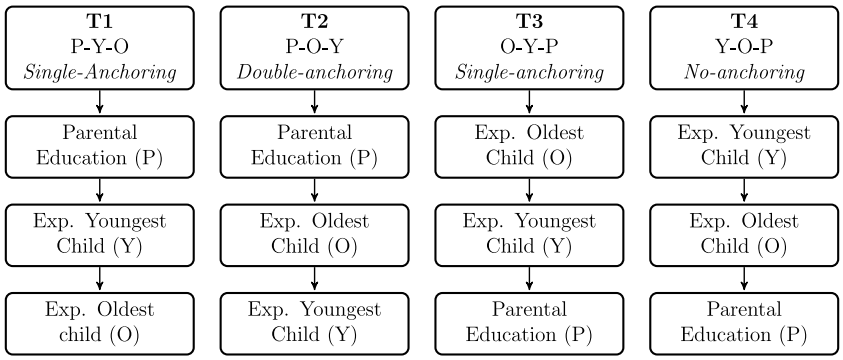


Fig. 1. Treatments based on exposure to anchors.

the expectations on educational outcomes and (*ii*) whether expectations about older children were collected before the expectations about their younger siblings. These two variations generate four treatments with different exposures to anchors, as shown in Fig. 1.[2]

The experimenters created four questionnaires which had the same sections and questions, but only varied in *question order* when collecting data on parental education and educational expectations. We refer to this set of questions as the educational module. In all four questionnaires, the location of this module was the same for everyone, but the order of parental education and educational expectations varied across all four questionnaires. These questionnaires are identified as $T1$, $T2$, $T3$ and $T4$ treatments shown in Fig. 1.

After asking about standard sociodemographic characteristics, in the *no-anchoring* treatment ($T4$) mothers are asked about the expected education for the youngest child first, followed by the second oldest, and continues until reaching the oldest child. After eliciting educational expectations for the oldest child, $T4$ finalises the educational module with the collection of parental education. Conversely, the *double-anchoring* ($T2$) treatment collects data on parental education first, followed by the oldest child educational expectations, then the second oldest, and so on. $T2$ finalises the educational module with the highest level of education expected for the youngest child. The rest of *single-anchoring* treatments, $T1$ and $T3$, elicit expectations about the youngest child either after parental education ($T1$) or after the educational expectation about older siblings ($T2$). When analysing our results we consider $T4$ as the baseline.

In our study, there are two possible types of adjustments derived from anchoring: *contrast* or *assimilation* effects. The first one refers to the respondent providing contrasting responses, moving away from the anchor; the second one refers to the opposite effect, moving closer to the anchor (Sherif et al., 1958; Tourangeau et al., 2000). In our case, contrast effects would be observed if educational expectations move away from below vocational training (*Below VT*) as 96% of mothers and 93% fathers have this level of education. Conversely, assimilation effects would be observed if educational expectations move closer to *Below VT*.

Because all four treatment groups were exposed to the same sociodemographic questions prior to the collection of parental education and educational expectations, any difference across treatments is uniquely explained by the anchoring induced by the treatments.

3. Sample

Our data was collected in 2016 as part of an impact evaluation on mobile-banking in rural Piura, Peru. The survey was administered to a random sample of women who were beneficiaries of the social programme *JUNTOS* and were living in 5 rural communities. The survey collected socioeconomic characteristics, including an educational module on parental education and subjective expectations about educational outcomes. In total, we interviewed 1,996 individuals and collected parental expectations on 4,040 children. Out of the total, 195 are *one-child* families. For our analysis we use the whole universe of observations. Our results do not change if we drop *one-child* families from the analysis.

The Appendix presents the main descriptive statistics of our sample (Table A). The mean and median age of children in our sample is 8 years old, the proportion of sons and daughters is the same (50%), 99% of them live at home and 85% are student. About 75% of the households in our sample live in a dwelling with soil floor and 95% live with a roof made of calamine. In addition, 79% of such households own a TV but only 2% own a landline. The average and median age of mothers is 36 years old. Parental education is heavily concentrated on below vocational studies/training (hereafter, VT). Only 4% of mothers and 7% of fathers achieved an education level above VT. However, the vast majority of parents expect their offsprings to get a college degree (around 69% of them).

In all our regressions reported below, we have included the following control variables: child age, child is male, child lives at home, floor made of tiles, floor made of concrete, floor made of ground, roof made of concrete, roof made of mat, roof made of

[1] For a detailed discussion on context effects see Tourangeau et al. (2000, Chapter 7).

[2] The instructions used in the questionnaires can be found in section G of Appendix.

Table 1
Anchoring effect on educational expectations.

Panel A					
Anchoring	Abbreviation	Highest level of education that mothers expect			
		Below VT	VT	College	Don't know
Single	T1: P-Y-O	4.52	21.99	65.36	8.13
	T3: O-Y-P	5.19	18.15	70.12	6.54
Double	T2: P-O-Y	4.92	20.37	68.31	6.40
None	T4: Y-O-P	2.91	22.27	71.43	3.38
Notes: Percentages by row add to 100.					
Panel B					
		(1) Below VT	(2) VT	(3) College	(4) Don't know
T1: P-Y-O		0.0194*	0.00529	−0.0703**	0.0455**
		(0.00854)	(0.0182)	(0.0203)	(0.0104)
T2: P-O-Y		0.0200*	−0.0129	−0.0357*	0.0287**
		(0.00867)	(0.0177)	(0.0198)	(0.00942)
T3: O-Y-P		0.0276**	−0.0293	−0.0295	0.0312**
		(0.00908)	(0.0176)	(0.0199)	(0.00967)
Observations		4,040	4,040	4,040	4,040
Overall sample (%)		4.36	20.74	68.84	6.06
Ref. cat. T4: Y-O-P (%)		2.91	22.27	71.43	3.38

Notes: VT stands for vocational training. Reference category corresponds to T4, Y-O-P.
All regressions control for sociodemographic characteristics, see Section 3 for full list of controls.
Robust standard errors in parentheses. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

calamine, number of bedrooms, dwelling has electricity, dwelling has drinking water, dwelling has a radio, dwelling has a TV, dwelling has landline phone, age of the mother, number of children, number of grandchildren, number of children who live with the mother and number of grandchildren who live with the mother (main respondent).[3] These variables were used to increase the precision of the estimated treatment effects since they are not correlated with the treatment by construction — as this is randomly assigned.

In the Appendix we show balance tests for treatments $T1$, $T2$, $T3$ and $T4$ (Figures A.1 and A.2). In most socioeconomic variables we observe balance across treatments. The few imbalances are observed in: number of days without enough food when comparing T2 vs the rest of treatments; age of the respondent and number of children when comparing T3 vs the rest; and age of respondent, number of children and grandchildren when comparing T4 vs the rest. Overall, these imbalances do not occur systematically across treatment groups (i.e. they do not happen for the same variable across all four groups) and they are expected by chance (we have 26 variables in our balance tables). Moreover, the vast majority of the confidence intervals are narrow and most of them around zero. It is reassuring to find no imbalances for variables linked to characteristics of the child and parental education.

4. Results

Panel A of Table 1 presents for each treatment the percentage of mothers reporting *below vocational training* (VT), *vocational training* and *college* as the highest level of education they expect for their children. We also report the percentage of mothers who are uncertain about such expectation (*don't know*). Each treatment follows the definition explained in Fig. 1.

This table shows that people report more optimistic expectations under the *no-anchoring* ($T4$) treatment than under any anchored treatment. A higher percentage of mothers report *below VT* as the expected highest level of education when they are *single* or *double-anchored* than when they are under $T4$ (our baseline category). The percentage of mothers reporting *below VT* as the highest educational level expected for their children is approximately 50% higher for any of the anchored ($T1/T2/T3$) treatments. Although anchoring might be used as a shortcut to make an assessment of uncertain events and therefore facilitate the cognitive process to generate a response, in our experiment, anchoring increases item non-response, see column of *Don't know* responses in Panel A. We present t-tests of the comparison between *anchored* and *non-anchored* treatments in Table E of Appendix.

Panel B of Table 1 analyses the main findings of Panel A using linear probability models (LPM). This analysis accounts for the few imbalances shown in Figures A.1 and A.2 of Appendix using the specification $y_{ih} = \mathbf{X_{ih}}\boldsymbol{\alpha} + \beta_1 T_{1ih} + \beta_2 T_{2ih} + \beta_3 T_{3ih} + \varepsilon_{ih}$. Our dependent variable y_{ih} denotes a certain level of expected education for child i living in household h. $\mathbf{X_{ih}}$ represents control variables and a constant, and $\mathbf{T_{ih}}$ denotes our treatments. We presented the list of controls used in our regressions in the previous Section 3. We define as reference category $T4$ (baseline). Dependent variables y_{ih} are represented by dummy variables equal to 1 for each expected

[3] Broadly, these control variables can be classified into three categories: characteristics of the child and respondent, and proxies of wealth.

educational level: *below VT*, *VT*, *college* or *don't know*; 0 otherwise. To consider the four treatments explained in the previous section, T_{1ih}, T_{2ih} and T_{3ih} are equal to 1 if the household has been allocated to $T1$, $T2$ or $T3$, and 0 otherwise.

Panel B shows that most of the significant differences are observed in the educational level *Below VT* and in *Don't Know*. This means that anchored treatments increase the chances of reporting *Below VT* and *Don't know*. Column (1) shows that mothers under the anchored treatments are on average 2 percentage points (p.p.) more likely to report *Below VT* as the highest level of education for their children than mothers in the *no-anchoring* treatment $T4$. Column (4) suggests that such mothers under the anchored treatments are also more likely to report *Don't know* when they were asked about their educational expectations for their children. On average, these mothers are 3–4.5 p.p. more likely to give such response than those allocated to the *no-anchoring* treatment. Our findings on *College* in Column (3) is the inverse mirror of our results for *below VT*. Mothers under the anchored treatments are 3–7 p.p less likely to report *College* as the highest level of education.[4] Our main conclusions remain the same when we omit *Don't Know* responses, see Table B in the Appendix.

To assess the accuracy of the expectations reported under each treatment, we carried out a näive assessment by comparing the reported expectations with the level of education in the region of Piura, where our data collection took place. Expectations data were compared with the percentage of people, 24 years old or older, who achieved *Below VT*, *VT* and *College* level of education in 2016. This data was taken from the Peruvian Office of National Statistics (INEI, 2018). Table D of Appendix shows the root mean square error (RMSE) of our expectations data per treatment. We conclude that the *no-anchoring* treatment ($T4$) generated the largest mismatch between the reported expectations and the observed data; this also means that anchored measures resulted to be more accurate showing the smallest RSME. In all cases, the RMSE is smaller under the $T1$ when parental education is asked before the expectations about their children. It is worth noticing that our assessment of accuracy is a conservative evaluation as we do not have the observed educational outcomes corresponding to the children of the families that were interviewed in our survey. All in all, we summarise our main result here:

> *Result 1.* Mothers who are exposed to anchoring report more pessimistic educational expectations and are more likely to answer *Don't know*.[5] Considering a näive assessment of the accuracy of the expectations data, we identified that the anchored treatments produce more accurate measures of future educational outcomes than the *no-anchoring* treatment $T4$.

This result means that *assimilation effects* are the type of adjustment observed in our study. The expectations reported by mothers allocated to the anchored treatment groups move toward the level of education of both parents (96% of mothers and 93% of fathers have *Below VT*). These suggest that anchored treatments remind mothers about the limitations of achieving high levels of education, either faced by themselves or by their older children, and therefore increases the chances of reporting lower levels of expected education for their children. Because in our sample the majority of older children are still attending school (85% of them) and half of them are 8 years old or younger, we have little variation in our data to explore how underachieving children may affect mothers' expectations about their younger offsprings. Our main results on anchoring effects are in line with previous findings on *assimilation effects* when asking about specific-to-general or general-to-specific life satisfaction survey questions (Schwarz et al., 1991) and about perceptions of political parties (Haddock, 2003), among other studies.

Next, we analyse whether the level of education of the mother influences the anchoring effect. Asking about parental education prior to the elicitation of educational expectations may induce a downward or upward adjustment of elicited expectations, depending on the level of the anchor. To explore how the level of the anchor affects the elicitation, we split our sample based on the education of the mothers. We define households with low educated mothers ($\leq prim$) if their maximum education is below or equivalent to "primary school" and households with high educated mothers ($> prim$) if they have more than primary education. Approximately 44 percent of our mothers belong to the low educated group and 56 percent to the high educated one.

Panel A in Table 2 shows the percentage of mothers reporting *Below VT*, *VT*, *College* or *Don't know* across treatments for households with low and high educated mothers, respectively. Looking into the two extremes of education, *Below VT* and *College*, we observe high educated mothers have more optimistic educational expectations for their children than the low educated ones. The percentages are much higher for *Below VT* in the group of low educated mothers, and much higher for *College* in the group of high educated mothers. This means that anchoring may differently affect mothers across treatments.

When comparing treatments within *Below VT*, anchoring effects are larger for low educated mothers than for high educated ones. The percentage of low educated mothers reporting *Below VT* in $T2$ is twice as high as in $T4$ (8.23 vs 3.56), whereas for high educated mothers the percentages are pretty similar under $T2$ and $T4$ (2.03 vs 2.42). However, when comparing *Don't know*, anchoring effects are slightly higher for educated mothers. For instance, the percentage of low educated mothers reporting *Don't know* in $T1$ is twice as high as in $T4$ (6.11 vs 3.56), whereas for high educated mothers the difference triples (9.73 vs 3.23). We present t-tests of the comparison between *anchored* treatments and the *no-anchoring* one in Table F of Appendix. All comparisons between each anchored treatment and T4 are significantly different from zero.

Panel B in Table 2 repeats the analysis conducted in Table 1 using LPM for low and high educated mothers. There are two important results: (*i*) with regard *Below VT*, low educated mothers are significantly more likely to be influenced by anchors than the high educated; and (*ii*) with regard *Don't know*, we observe the opposite, high educated mothers are significantly more likely

[4] When we restrict our sample to only the oldest child — the child born first, our main findings hold for *VT*, *College* and *Don't Know*. For Below VT, we find the same sign of coefficients and similar magnitudes, but they are not significantly different from the *no-anchoring* treatment.

[5] More pessimistic expectations do not mean more or less accurate measures of what we will observe in the future. These expectations refer to lower levels of education reported by the mothers subject to anchors than those reported by the rest of mothers in the sample.

Table 2
Anchoring effect on parental expectations: By maternal education.

Panel A								
Anchoring	Highest level of education that mothers expect							
	Below VT		VT		College		Don't know	
	$\leq prim$	$> prim$	$\leq prim$	$> prim$	$\leq prim$	$> prim$	$\leq prim$	$> prim$
T1: P-Y-O	6.79	2.70	23.98	20.36	63.12	67.03	6.11	9.73
T2: P-O-Y	8.23	2.03	21.52	19.34	63.08	72.74	6.96	5.89
T3: O-Y-P	7.21	3.56	26.28	11.61	60.47	77.90	6.05	6.93
T4: Y-O-P	3.56	2.42	24.05	20.84	67.93	73.51	3.56	3.23

Panel B								
Anchoring	Highest level of education that mothers expect							
	Below VT		VT		College		Don't know	
	$\leq prim$	$> prim$	$\leq prim$	$> prim$	$\leq prim$	$> prim$	$\leq prim$	$> prim$
T1: P-Y-O	0.0401***	0.00258	0.00699	0.00490	−0.0627**	−0.0757***	0.0156	0.0683***
	(0.0151)	(0.00964)	(0.0289)	(0.0235)	(0.0319)	(0.0264)	(0.0147)	(0.0145)
T2: P-O-Y	0.0417***	−0.00512	−0.0247	−0.00475	−0.0469	−0.0188	0.0299**	0.0286**
	(0.0156)	(0.00841)	(0.0279)	(0.0232)	(0.0311)	(0.0259)	(0.0145)	(0.0125)
T3: O-Y-P	0.0429***	0.0103	0.0326	−0.0743***	−0.0994***	0.0255	0.0239*	0.0385***
	(0.0151)	(0.0107)	(0.0295)	(0.0212)	(0.0319)	(0.0250)	(0.0145)	(0.0128)
Observations	1,790	2,250	1,790	2,250	1,790	2,250	1,790	2,250
Overall sample (%)	6.48	2.67	23.97	18.18	63.85	72.8	5.7	6.36

Notes: VT stands for vocational training. Reference category corresponds to T4, Y-O-P.
All regressions control for sociodemographic characteristics, see Section 3 for full list of controls.
Robust standard errors in parentheses. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

to report *Don't know* than the low educated. Indeed, our findings indicate that mothers allocated to the anchored treatment groups, with at most primary education, are about 4 p.p. more likely to report their children will achieve an educational level *Below VT* than those mothers in $T4$. We do not find significant differences between anchored treatments and $T4$ for high educated mothers in the *Below VT* column. This suggests that mothers with low education are driving the results on *Below VT* shown in Table 1. *Assimilation effects* are only observed in the low educated sample, shown in Table 2, as their responses move toward *Below VT*. Conversely, anchored treatments affect *Don't know* responses for both low and high educated mothers. Mothers in anchored treatment groups are 2.4–6.8 p.p more likely to report *Don't know* than those in the *no-anchoring* treatment. These results are statistically similar in magnitude with exception of $T1$ where high educated mothers present a slightly higher treatment effect.

When both low and high educated mothers are exposed to the *no-anchoring* treatment ($T4$), they are more likely to report *College* as the highest level of education than mothers allocated to the anchored treatments $T1$, $T2$ and $T3$. This is consistent with what we observe for *Below VT*. Our results are robust to omitting *Don't know* responses, see Table C in the Appendix. We summarise our second result here:

> *Result 2.* Anchoring differently affects low and high educated mothers: the former become more pessimistic when reporting educational expectations while the latter are more likely to report *Don't know*.

This finding is in line with the evidence provided by Wilson et al. (1996) about knowledgeable people being less susceptible to anchoring effects. Highly educated mothers might be less susceptible to anchoring effects because of their knowledge about the most likely educational outcome for their children. Mothers who have already experienced high levels of education have more information about what the process of acquiring further education involves, whereas mothers without this experience may have less information. However, despite high educated mothers may have more information, anchoring increases the level of uncertainty (*don't know*) reported by both low and high educated mothers.

Two possible channels that might explain the differences between low and high educated mothers in item nonresponse (*Don't know*) are: (a) the number of possible alternatives considered by low/high educated mothers when eliciting their expectations and (b) the influence of social desirability. For the former, when mothers are exposed to anchors, the low educated group has two options: to report the same level of education as theirs or a higher level — reporting a lower level of education than theirs is not possible. In contrast, high educated mothers have three options to consider: to report the same level of education as theirs, a lower or a higher level. When mothers are anchored, high educated mothers will need to assess three possible alternatives (instead of two), and therefore this might increase the cognitive burden for them; hence the percentage of *Don't know* increases. The second explanation is social desirability bias. According to Groves et al. (2009, Chapter 6, p. 209), this bias may influence a respondent to refuse to answer a question (or provide a *Don't know* answer) instead of revealing a socially unacceptable attribute. This might be possible if high educated mothers, after being exposed to the anchored treatments, expect the level of their children to be lower than the socially desirable and therefore, they prefer to not report it. Moreover, Bishop et al. (1986) has found low educated people are

more likely to provide opinions on fictitious topics than their high educated counterparts. The authors do not have an experimental design to disentangle the main reason why high educated mothers report a higher proportion of *Don't know* than the low educated ones, however, we discuss possible channels that might explain our results.

Finally, in the Appendix we split our analysis by gender. Tables G and H of Appendix show LPM for sons and daughters, separately. Despite the fact that most differences are not statistically different from zero, we identify that parents tend to report lower levels of education for daughters than for sons in $T1/T2/T3$ when comparing with $T4$; Table I of Appendix reports the p-values of coefficient differences. However, parents are more likely to report *Don't know* in $T1/T2/T3$ than in $T4$ when asked about their sons. This suggests that our main anchoring effects on the chances of reporting *Don't know* are primarily driven by sons, but on reporting lower levels of education, in contrast, might be driven by the expectations on their daughters' educational outcomes. While it is true that fathers have slightly higher education than mothers in our sample and this could explain the differences in expectations between daughters and sons, our findings on *Don't know* responses might be more related to social desirability bias. It is perhaps not desirable to publicly acknowledge low levels of education for sons, and as a result this might increase non-response. The latter is a speculative explanation as we do not have evidence to support it, however, given the low-income context in a still traditional society, we believe this is a plausible explanation.

5. Discussion and conclusions

We study anchoring effects when eliciting the highest level of education that parents expect their children to achieve in the future. To do so, we use a 2×2 between-subjects survey experiment where we randomly allocate mothers to one of four possible treatments. Treatments vary according to whether parental education was asked before their expectations, and whether their expectations about the oldest child was elicited before the youngest. We have two main results:

(*i*) Expectations are sensitive to survey design. Inducing mothers to think first about their own education and/or their oldest child expected education, makes mothers to downwardly adjust her expectations. Moreover, anchoring when eliciting subjective expectations may induce item non-response which translates into information loss and monetary costs. Indeed, when mothers were anchored (i.e. $T1$, $T2$, and $T3$), 7.02% of mothers answered *Don't Know* when asked about the expected highest education for their offsprings. In contrast, only 3.38% of mothers reported *Don't Know* under the *no-anchoring* treatment.

(*ii*) We also find that the level of *anchoring* matters. When we split the sample between households with low educated mothers (low anchor) and high educated mothers (high anchor), mothers subject to a low anchor are more likely to report lower levels of expected education than those mothers subject to a high anchor. Likewise, high educated mothers (> primary) are more likely to report *Don't Know*.

Our results suggest that potential comparability issues may emerge in survey instruments when eliciting expectations data. If context is changed as a result of a change in question order, comparability issues may emerge between surveys collecting the same data in the same period, or within the same survey when collecting the same data in different periods. Researchers should be aware that these data may be sensitive to anchoring effects, and therefore, need to consider the potential comparability issues that might emerge when changing question order. Our findings also highlight that anchoring may impact the predictive power of expectations data which, in our case, helps to provide more accurate predictions of educational outcomes. We expect our findings to be applicable to similar field settings to ours where low educated populations remain with high levels of uncertainty about the future of their children or when social norms may affect item response on educational outcomes.

Experimental and observational studies should consider potential anchoring effects when eliciting expectations data. To avoid anchoring effects, one solution is to place survey questions of unrelated content to the expectations data before the elicitation of expectations or questions of related content after such data are collected. Another solution is to place expectations data scattered among questions of unrelated content in the survey questionnaire, as discussed by Tourangeau et al. (2000, Chapter 7, p. 202) when examining the influence of inflation questions on the support for a piece of legislation in the US. However, if the main purpose of the elicitation of expectations is to predict future outcomes, our results suggest to use anchors of related content to help the respondent to make a more accurate assessment. Based on the results discussed in here, the authors recommend piloting the order of questions in survey instruments prior to scaling-up data collection involving the elicitation of expectations. This should be done with a sample of people similar to the target population and with the same wording that will be used in the scale-up survey. Depending on the main aim of the study (i.e., item-response vs prediction), the researchers may want to consider either *anchored* or *non-anchored* elicitation of expectations data.

Appendix A. Supplementary data

Supplementary material related to this article can be found online at https://doi.org/10.1016/j.joep.2022.102510.

References

Armantier, O. (2006). Estimates of own lethal risks and anchoring effects. *Journal of Risk and Uncertainty*, *32*(1), 37–56.

Attanasio, O. P., & Kaufmann, K. M. (2014). Education choices and returns to schooling: Mothers' and youths' subjective expectations and their role by gender. *Journal of Development Economics*, *109*, 203–216.

Bishop, G. F., Tuchfarber, A. J., & Oldendick, R. W. (1986). Opinions on fictitious issues: The pressure to answer survey questions. *Public Opinion Quarterly*, *50*(2), 240–250.

Bleemer, Z., & Zafar, B. (2018). Intended college attendance: Evidence from an experiment on college returns and costs. *Journal of Public Economics*, *157*, 184–211.

Cunha, F., Elo, I., & Culhane, J. (2013). *Eliciting maternal expectations about the technology of cognitive skill formation*: *Technical report*, National Bureau of Economic Research.
Epley, N., & Gilovich, T. (2001). Putting adjustment back in the anchoring and adjustment heuristic: Differential processing of self-generated and experimenter-provided anchors. *Psychological Science*, *12*(5), 391–396.
Epley, N., & Gilovich, T. (2004). A tale of tuned decks? Anchoring as adjustment and anchoring as activation. *The Blackwell Handbook of Judgment and Decision Making*, *240–256*.
Fochmann, M., Müller, N., & Overesch, M. (2021). Less cheating? The effects of prefilled forms on compliance behavior. *Journal of Economic Psychology*, *83*(102365), 1–20.
Goyette, K. A. (2008). College for some to college for all: Social background, occupational expectations, and educational expectations over time. *Social Science Research*, *37*(2), 461–484.
Groves, R. M., Fowler, F. J., Jr., Couper, M. P., Lepkowski, J. M., Singer, E., & Tourangeau, R. (2009). *Survey methodology* (2nd ed.). John Wiley & Sons.
Haddock, G. (2003). Making a party leader less of a party member: The impact of ambivalence on assimilation and contrast effects in political party attitudes. *Political Psychology*, *24*(4), 769–780.
Herr, P. M. (1989). Priming price: Prior knowledge and context effects. *Journal of Consumer Research*, *16*(1), 67–75.
Hurd, M. D. (1998). *Anchoring effects in the HRS: experimental and nonexperimental evidence*: *Technical report*, National Bureau of Economic Research.
Ifcher, J., & Zarghamee, H. (2020). Behavioral economic phenomena in decision-making for others. *Journal of Economic Psychology*, *77*(102180), 1–17.
INEI (2018). *Peru: Indicadores de Educación por departamento, 2007–2017*: *Technical report*, Instituto Nacional de Estadística e Informática.
Jiang, C.-M., & Ma, J.-T. (2019). "When your anchor sinks your boat": A replication and extension study. *Journal of Economic Psychology*, *75*(102138), 1–8.
Kimbrough, E. O., Porter, D., & Schneider, M. (2021). Reference dependent prices in bargaining: An experimental examination of precise first offers. *Journal of Economic Psychology*, *86*(102406), 1–13.
Maaravi, Y., & Levy, A. (2017). When your anchor sinks your boat: Information asymmetry in distributive negotiations and the disadvantage of making the first offer. *Judgment & Decision Making*, *12*(5).
Mason, M. F., Lee, A. J., Wiley, E. A., & Ames, D. R. (2013). Precise offers are potent anchors: Conciliatory counteroffers and attributions of knowledge in negotiations. *Journal of Experimental Social Psychology*, *49*(4), 759–763.
Reynolds, J. R., & Pemberton, J. (2001). Rising college expectations among youth in the United States: A comparison of the 1979 and 1997 NLSY. *Journal of Human Resources*, *36*(4).
Schuman, H., Presser, S., & Ludwig, J. (1981). Context effects on survey responses to questions about abortion. *Public Opinion Quarterly*, *45*(2), 216–223.
Schwarz, N., & Hippler, H.-J. (1995). Subsequent questions may influence answers to preceding questions in mail surveys. *Public Opinion Quarterly*, *59*(1), 93–97.
Schwarz, N., Strack, F., & Mai, H.-P. (1991). Assimilation and contrast effects in part-whole question sequences: A conversational logic analysis. *Public Opinion Quarterly*, *55*(1), 3–23.
Sherif, M., Taub, D., & Hovland, C. I. (1958). Assimilation and contrast effects of anchoring stimuli on judgments. *Journal of Experimental Psychology*, *55*(2), 150.
Tourangeau, R., Rips, L. J., & Rasinski, K. (2000). *The Psychology of Survey Response*. Cambridge University Press.
Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, *185*(4157), 1124–1131.
Ünveren, B., & Baycar, K. (2019). Historical evidence for anchoring bias: The 1875 cadastral survey in Istanbul. *Journal of Economic Psychology*, *73*, 1–14.
Wilson, T. D., Houston, C. E., Etling, K. M., & Brekke, N. (1996). A new look at anchoring effects: basic anchoring and its antecedents. *Journal of Experimental Psychology: General*, *125*(4), 387.
Wilson, K., Wolfe, B., & Haveman, R. (2005). The role of expectations in adolescent schooling choices: Do youths respond to economic incentives? *Economic Inquiry*, *43*(3), 467–492.
Wiswall, M., & Zafar, B. (2014). Determinants of college major choice: Identification using an information experiment. *Review of Economic Studies*, *82*(2), 791–824.
Zafar, B. (2011). How do college students form expectations? *Journal of Labor Economics*, *29*(2), 301–348.
Zafar, B. (2013). College major choice and the gender gap. *Journal of Human Resources*, *48*(3), 545–595.