FCEA FACULTAD DE CIENCIAS ECONÓMICAS Y DE ADMINISTRACIÓN | IECON INSTITUTO DE ECONOMÍA | UNIVERSIDAD DE LA REPÚBLICA URUGUAY

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INSTITUTO DE ECONOMÍA
Serie Documentos de Trabajo

Junio, 2022
DT 04/2022

ISSN: 1510-9305 (en papel)
ISSN: 1688-5090 (en línea)

La investigación fue financiada por el Fondo Clemente Estable (2018) de la Agencia Nacional de Investigación e Innovación (ANII).

Forma de citación sugerida para este documento: Leites, M. Paleo, C., Ramos, X, y Salas G. (2022) “Choosing of Inheriting the Joneses: The origins of reference groups”. Serie Documentos de Trabajo, DT 04/2022. Instituto de Economía, Facultad de Ciencias Económicas y Administración, Universidad de la República, Uruguay.

Choosing or Inheriting the Joneses: The origins of reference groups*

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Abstract

Do individuals choose their reference groups, i.e. their Joneses, or are they culturally transmitted across generations? We provide evidence that feeds the theoretical debate about the endogeneity or exogeneity of reference groups. Our findings for Uruguay suggest that reference groups are largely transmitted across generations. We also find individuals to have multiple reference groups and these to be context-specific. Our results are robust to several checks and endogeneity issues.

Keywords: Intergenerational transmission; reference group; income comparisons.
JEL codes: D31, D62, D63, Z13.

Resumen

¿Los individuos eligen sus grupos de referencia, es decir sus Joneses, o se transmiten culturalmente de generación en generación? Aportamos evidencia que alimenta el debate teórico sobre la endogeneidad o exogeneidad de los grupos de referencia. Nuestros hallazgos para Uruguay sugieren que los grupos de referencia se transmiten en gran medida entre generaciones. También encontramos individuos que tienen múltiples grupos de referencia y estos son específicos del contexto. Nuestros resultados son robustos a diferentes chequeos y problemas de endogeneidad.

Palabras clave: Transmisión intergeneracional; grupos de referencia; comparación de ingresos
Código JEL: D31, D62, D63, Z13

*This research was funded by the Clemente Estable 2018 Agencia Nacional de Investigación e Inovación (ANII).

1 Introduction

Interpersonal comparisons or relative concerns are a key element to understand individual behavior. People compare with others to self-evaluate their wellbeing or their job satisfaction (Easterlin, 1974, 1995; Clark and Oswald, 1996), measure their opinions and abilities (Festinger, 1954), form income prospects (Hirschman and Rothschild, 1973), gain access to better information (Heffetz and Frank, 2011), decide about consumption baskets (Frank, 1985; Charles et al., 2009; Kaus, 2013; Heffetz and Frank, 2011), make effort or labor supply decisions (Boskin and Sheshinski, 1978; Piketty, 1998; Postlewaite, 1998; Bowles and Park, 2005; Austen-Smith and Fryer, 2005; Cullen and Perez-Truglia, 2018), and to form preferences (Heffetz and Frank, 2011; Bowles, 1998) or attitudes towards inequality or fairness (Fehr and Schmidt, 1999, 2003; Clark and D'Ambrosio, 2015; Cojocaru, 2014). More generally, reference groups are a source of norms, attitudes, values, tastes, and preferences (Merton, 1968; Clark and D'Ambrosio, 2015).

Despite its relevance, previous empirical work is scarce and has focused on describing which are the relevant reference groups, paying very limited attention to understanding how reference groups are formed. There are different hypothesis about how people form their reference groups. While some scholars argue that individuals actively choose their reference groups, other authors contend that the relevance and composition of reference groups is exogenously determined by the social context where people live and by cultural transmission from parents to children.

In line with the first hypothesis, several economic models assume that the choice of reference groups responds to individuals' optimization decisions, which can be interpreted as rational choices within the traditional human capital investment framework (Becker and Tomes, 1986; Falk and Knell, 2004; Austen-Smith and Fryer, 2005).[1] In these models, the choice of reference groups responds to individual preferences, aspects of social psychology, or the presence of strategic behaviors (Falk and Knell, 2004; Heffetz and Frank, 2011; Clark, 2012; Clark and D'Ambrosio, 2015).

In contrast, evolutionary explanations based on cultural evolution argue that offspring imitate or adopt the cultural traits of their parents and other individuals they meet in their lives (Bisin and Verdier, 1998, 2011). Other models that view comparisons as instrumental link the origin of reference groups to social arrangements (Postlewaite, 1998; Weiss and Fershtman, 1998).

Providing empirical evidence about the endogeneity or exogeneity of reference groups is crucial to understand preferences, aspirations, and behavior. Piketty (2000) and Bourguignon et al. (2007) emphasize this aspect to explain the persistence of inequality, by stressing the relevance of sociocultural inequalities and their effects through the transmission of preferences and beliefs. These mechanisms could generate mobility traps and also efficiency losses in aggregate well-being. Therefore, understanding how they work is ultimately relevant to gain a better understanding of the trade-off between inequality and efficiency.

We provide direct evidence about the intensity (how much) and direction (to whom) of income comparisons in a middle income country, Uruguay, and explore whether the intensity and direction of income comparisons depend on the social background. In line with the evolutionary approach, we examine whether parents transmit their preferences for status to their offspring by estimating, for the

[1] This is not to say that these models ignore the conditioning role of contextual factors, such as the availability of information and the transparency of environmental factors (Diener and Fujita, 1997). For instance, Clark and Senik (2010) suggest that reference groups depend on the type of regular social interactions of individuals, and Falk and Knell (2004) argue that the selection of the reference groups is partly endogenous (explained by enhancement or self-improvement motives) and partly exogenous (constrained by individual's contextual factors).

first time, the intergenerational transmission of reference groups. Also, in contrast to previous studies, we check whether the intensity and the groups individuals compare with is context-specific. Inspired by Duesenberry (1967), we frame comparisons in two different situations. First, a Job Offer setting, where after receiving a job offer, respondents are invited to place a salary proposal for a new job and are asked whose salary (and with what intensity) they would compare with. The second one is an Economic Crisis setting, where respondents are asked whether they would care if their income fell below the income of the same set of groups considered in the previous setting.

There is little evidence on how reference groups are determined. Clark and Senik (2010) use tailor-made questions to find out which groups are most relevant to European people. European Social Survey respondents are first asked about intensity of comparisons (in general) and then are invited to indicate which is the most relevant reference group from a delimited set. From this study we cannot know how many and what groups individual compare with and what is the intensity in each case, as the questions on the direction and the intensity of comparisons are not linked, and respondents are not allowed to choose more than one reference group. In contrast, Friehe et al. (2018) allow individuals to report the intensity of comparison with different groups. Using the German Socio-Economic Panel, the authors find heterogeneity in positional income concerns within subjects for different groups and between subjects for the same group.

We use data for Uruguay, from the Longitudinal Welfare Study in Uruguay (ELBU, by its Spanish acronym), a unique panel data set, which includes tailor-made questions designed to investigate what are the reference groups and how they are formed. Besides the relevant questions on intensity and direction of income comparisons, the ELBU includes a rich set of control variables that include (i) socioeconomic characteristics, (ii) personality traits of the mother and their children, and (iii) attributes of best friends reported by the mother and the youngster. Key for our study, mothers can be matched to their children to examine the intergenerational transmission of reference groups.

We study young individuals who are about 20 years old and their mothers. Evidence about the formation of reference groups at this age is especially relevant because, as argued by the "hypothesis of impressionable years", this is a crucial stage of life during which individuals form beliefs that are unlikely to vary significantly in later stages (Inglehart and Baker, 2000). We only consider mothers in the main part of the paper because we have a very reduced number of fathers in the sample. This notwithstanding, we report estimates for fathers in the Appendix, which should be taken with caution given the small sample size and the possibility of self-selection.

Our results show that individuals compare with several groups with different intensities. This is in line with previous findings for Germany (Friehe et al., 2018). One first novelty of our study is that it shows for the first time that both intensity and direction of income comparisons are context-specific. Individuals compare with different people and at different intensity when their income falls for exogenous reasons, a crisis, than when they decide about the wage they would like to receive in a new job offer. Our main result is the strong and robust association between the answers of mothers and their offspring, which provides supporting evidence in favor of the view that exogenous factors are responsible for the importance and type of reference groups people compare with. The intensity and direction of mothers is always the most important determinant of their children's reports about intensity and direction of comparisons. Furthermore, we also find little evidence on possible sources of endogeneity in the formation of reference groups, as the vast majority of the covariates we include in the regressions, which comprise children's characteristics and family variables, are not statistically significant.

Heterogeneity analysis shows that while the gender of children does not matter in the transmission of intensity, it does in the transmission of reference groups, where same-gender correlations are larger for some groups.

Our baseline model includes individual/household fixed effects to control for family-invariant characteristics. In this sense, we provide a precise measure of the mother-children transmission parameter. These results on the intergenerational transmission of reference groups are robust to several checks. First, our conclusions hold when we saturate our specifications with a large set of maternal and own control variables. They are also robust when we address endogeneity issues due to measurement error of mothers reports about their comparisons, reverse causality, or the omission of relevant variables. To this end, we employ different measures of direction and intensity, originally put forth by Clark and Senik (2010), and we instrumented the intensity and direction of comparison of the mother considering these measures in an alternative scenario, following the proposal of Gillen et al. (2019). Finally, our results are not sensitive to randomizing mother and household characteristics to ensure that our intergenerational estimates are not spuriously driven by similarities in observable characteristics between mothers and children or by a correlation between generations.

We contribute to several strands of the literature. First, our findings about the importance of the family in the formation of reference groups informs the literature, mostly theoretical, that inquires whether reference groups are endogenous or exogenous. Second, the strong intergenerational transmission of reference groups we find in our sample contributes to the empirical literature on the intergenerational transmission of norms, preferences, and values, which increases our understanding of the persistence of inequalities and poverty. Third, our paper also contributes to the literature on interpersonal comparison in at least two directions. First, we provide new evidence about individuals' heterogeneity on the direction and intensity of comparisons. Our results suggest that people compare with more than one group, and the comparison intensity is heterogeneous between individuals and comparison groups. The results are robust to the use of alternative strategies and variables. As a particular case, they are consistent when the measurement of intensity and direction is based on measures used in mains previous findings on this field. Second, we consider two novel ways of measuring intensity, beyond the simple average score across all reference groups used so far by previous studies, which allow us to check the robustness of our findings. Finally, we contribute to the literature on reference groups by examining for the first time whether the intensity and direction of interpersonal comparisons are sensitive to the context where they are framed.

The rest of the paper is organized as follows. Section 2 presents the data and our variables of interest, while section 2.3 presents descriptive statistics of the data. Section 3 describes the empirical strategy and 4 summarizes the main results. Section 5 presents the robustness checks and sensibility analysis. Finally, section 6 includes some final comments.

2 Data and main variables

2.1 The ELBU

This paper uses data from the third and four waves of the Longitudinal Welfare Study in Uruguay (ELBU, by its Spanish acronym), collected in 2011/12 and 2016/17, respectively. The ELBU interviews a sample of mothers whose children attended the first year of public school in Uruguay (85% of the cohort) in 2004, when the first wave went to the field. To study the intergenerational transmission of reference groups we exploit the information reported by the offspring, which were interviewed in the

fourth wave for first time since the ELBU started. The dataset includes socioeconomic characteristics, personality traits of the mothers and offspring, attributes of the offspring best friends reported by the offspring, and a broad set of attitudes and perceptions. This broad set of controls will help us identify the intergenerational transmission of reference groups. The ELBU also contains mother's reports on the youth's grandparent's occupation and grandmother's occupation and education, which we will use to instrument mothers' reference groups.

2.2 Intensity and direction of the interpersonal comparisons

The fourth wave of the ELBU includes two questions that capture the intensity and direction of income comparisons. To investigate whether comparisons are context-specific, the comparison survey questions are framed in two different economic situations: Respondents answer the comparison questions in the face of an own income increase (that we will refer to as 'Job Offer' hereafter) and of an own income decrease ('Economic Crisis'). In the Job Offer scenario, the survey question reads: "Imagine that you get an offer of a permanent full-time job that you like. Your potential employer asks you to indicate the wage you are willing to receive. For each of the following items, please indicate in a scale from 1 to 10 (where 1 is very little and 10 is a lot) how true it is that you would consider, in your proposal the wage of [reference group]", where the possible reference groups are: friends, family, neighbors, people with the same job profile, and workers in their union. In the Economic Crisis scenario, respondents are asked: "Imagine that there is an economic crisis and your household income is reduced. Indicate on a scale from 1 to 10 (where 1 is very little and 10 is a lot), how true it is that your economic satisfaction would be affected if your income falls below the income of [reference group]", where possible reference groups are the same as in the Job Offer scenario. It is important to note that respondents are allowed to choose more than one reference group in their answers, i.e. social groups are not mutually exclusive. This is an important feature of the questions we use, which distinguishes them from previously used questions (e.g. Clark and Senik (2010)). Obviously, respondents also have the possibility to choose different reference groups across the two economic scenarios. Annex Table A1 shows the wording of every possible response to the two questions. While the above social groups represent external benchmarks, the ELBU also includes an internal benchmark (own past income) for mothers only.

Besides the raw individual intensity reports for each one of the reference groups, we also measure the intensity of comparisons in two additional ways. A first measure computes the maximum value of the answers of each respondent across all the external reference groups, for the Job Offer and Economic Crisis scenarios separately. We will refer to this as the highest-intensity measure. Following Friehe et al. (2018), a second measure indicates the number of external groups for which the following two conditions are satisfied: (i) the reported value is greater than 7 and (ii) the former value is also the maximum intensity across all options. That is, our second measure considers that a person does not compare at all if she does not report a value higher than 7 for any of the groups. We will refer to this as the number-of-high-intensity-groups measure.[2]

Table 1 shows the percentage of mothers and children that compares with each group, according to

[2]Respondents are allowed to answer that they do not compare at all. However, we do not use this answer, as it was misunderstood both by interviewers and respondents. Interviewers misunderstood the answer as many of them entered a value of zero to the option 'I do not compare' when respondents reported to compare with any of the groups available. Note that the minimum value allowed in this question is one, so interviewers mistook when they entered a value of zero to the option 'I do not compare'. In turn, respondents misunderstood the question when they assigned the same (positive) value to one of the possible reference groups and to the option 'I do not compare'. These two answers should go in opposite directions. Respondents may have been confused by the double negation nature of this option.

the second measure explained above, i.e. we consider that a person compares to a group if the intensity of income comparison reported for that group is larger than 7. Since answers are not mutually exclusive, individuals will have more than one comparison group whenever the maximum value is the same for more than one group (and larger than 7). That is, columns in Table 1 add up to more than 100. In each case, the Table distinguishes children according to their sex, and mothers according to whether they are unemployed or not.

Labor related groups dominate when the scenario is about a Job offer and the relevant outcome is labor income. The reference group composed of people with the same profile (education and experience) predominates while the second most preferred reference group is that of union workers. This result is confirmed for all children (regardless of their sex). In the case of mothers, labor related groups dominate among those who work. Among unemployed women, the family gains greater relevance to the detriment of the union.

Results differ when the scenario is of Economic Crisis and the relevant outcome is household income. Now what we call social groups (family, friends, neighbors) are more relevant than labor related groups (same profile and union workers). Family is the most relevant comparison group while people with the same profile comes second and continues to be one of the groups with whom individuals compare the most. The proportion of children is usually somewhat larger than the proportion of mothers who compares with any of the groups. Overall, a bit less than half the mothers and the children report comparing with high intensity with at least one group. Finally, unlike Job Offer scenario, when the scenario is of Economic Crisis, the comparison group of the mothers is insensitive to their employment status.

Table 1: Percentage of children and mothers who identify with the different comparison groups. Job Offer and Economic Crisis scenarios

	a) Job Offer						b) Economic Crisis					
	Children			Mothers			Children			Mothers		
	All	Fem.	Male	All	Empl.	Unemp.	All	Fem.	Male	All	Empl.	Unemp.
					Social groups							
Friends	10.2	9.6	10.7	9.1	9.1	9.0	15.4	14.2	16.7	12.6	12.3	13.5
Neighbors	2.6	2.7	2.5	3.2	3.2	3.4	3.5	3.0	4.1	5.7	5.7	5.6
Families	12.5	13.6	11.3	8.6	7.2	12.4	26.8	31.9	21.4	23.5	24.2	21.9
					Labor related groups							
Same profile	34.5	34.9	34.0	33.1	32.8	33.7	23.4	22.9	23.9	27.7	27.1	29.2
Union	14.6	13.3	16.0	14.0	15.5	10.1	11.4	9.6	13.2	15.1	15.5	14.0
Does compare	47.4	48.2	46.5	44.2	45.3	41.0	46.5	47.3	43.4	46.3	47.0	44.4
Does not compare	52.6	51.8	53.5	55.8	54.7	59.0	53.5	52.7	56.6	53.7	53.0	55.6

Note: Individuals are considered to compare with a given group if they report a value greater than 7 and this is also the maximum value they report across all groups. This means that individuals may compare with more than one group. Note that if individuals report values greater than 7 for some groups but these are not the maximum values they report (i.e. they report larger values for other groups), they will not be considered to compare with the former groups

Figure 1 shows the distribution of the highest-intensity measure, i.e. the maximum value reported across the external benchmarks, by mothers and children separately, for both scenarios. The distribution is similar in both scenarios for mothers and children, having a mode at the lowest score and large mass at scores larger than 7 –the mass being monotonically increasing as intensity scores increase. Additionally, the mass at score 5 is larger than the mass at any of the other remaining scores (2, 3, 4, 6, 7). Average Highest-intensity measure (not shown) are 5.5 and 5.8 for mothers and children,

respectively. One important point is that, in the case of the mothers the distribution of responses is insensitive to their employment status.[3]

Figure 1: Distribution of the maximum intensity of interpersonal comparisons. Mothers and children, by scenario

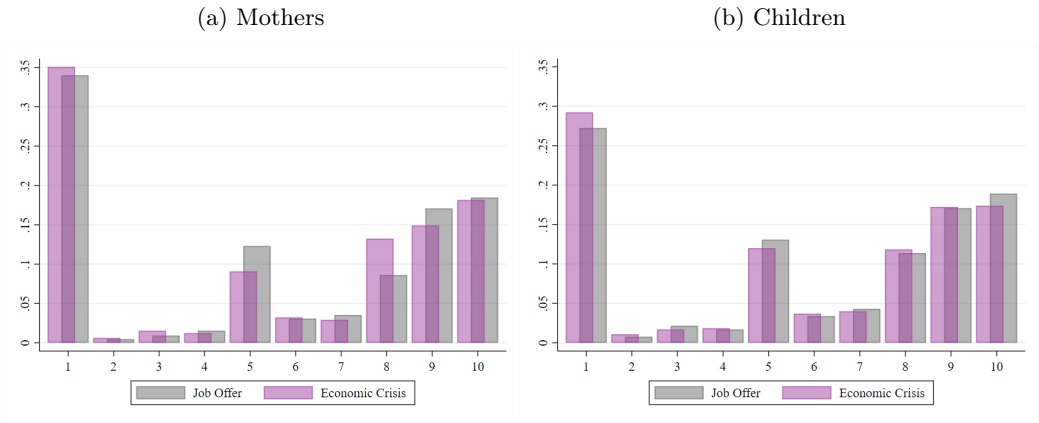
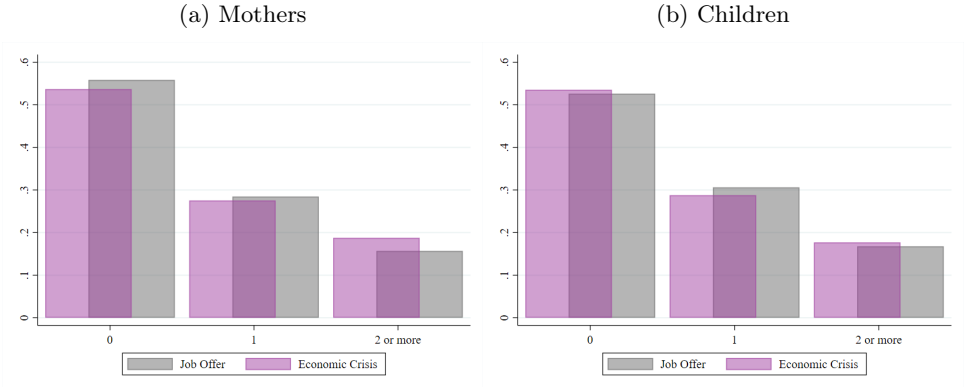


Figure 2 shows the distribution of the number-of-high-intensity-groups measure –recall that individuals can have more than one comparison group. Once again the distributions for children and mothers are similar. The Figure shows that a bit less than one fifth of individuals report comparing with more than one group. These shares are similar by type of respondent (mothers or children) and by scenario, and represent a bit less than half the individuals who report comparing at all. This shows that when studying the direction of income comparisons it is important to use survey questions that allow respondents to pick more than one group.

Figure 2: Distribution of the number of groups with which mothers and children compare, by scenario



Note: The value 0 corresponds to the option *Not compared* in Table 1. Source: ELBU

Do reported intensity scores of different comparison groups follow any pattern? In its upper-left (Job Offer scenario) and its bottom-right (Economic Crisis scenario) quarters, Figure 3 shows that

[3]Due to space constraints the corresponding distribution by mother's employment status are not reported, but they are available upon request to the authors.

correlations between intensity scores are neither very large –typically lower than 0.6– nor very small – usually larger than 0.3. There are three patterns worth noting. First, correlations between comparison groups are larger for the Economic Crisis scenario than for the Job Offer scenario. Second, 'family' is the most complementary comparison group, as it systematically shows larger correlations with the other comparison groups than any other group. Finally, correlations between different comparison groups are very similar for mothers and children.

Figure 3: Correlations between comparison groups

Note: Colors indicate the size of the correlation: gray when it is less than 0.1; light blue when it is between 0.1 and 0.3, blue if it is between 0.3 and 0.4; and lilac if it is greater than 0.4. All coefficients are significant at 1%. Source: ELBU.

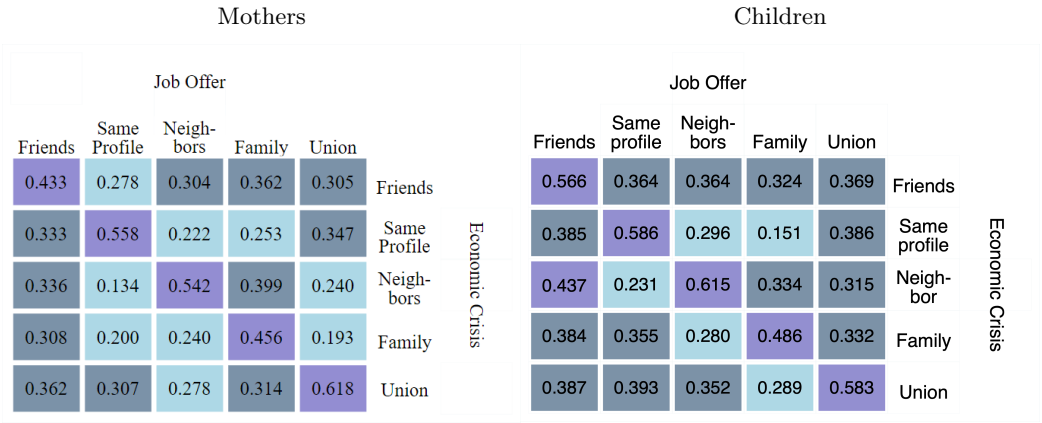
2.3 Is intensity and direction of comparisons context-specific?

Previous empirical studies that seek to elicit the groups individuals compare with and the intensity of such comparisons share two features: they study comparisons in one outcome variable only, and use questions that are framed in a general settings and not in a particular context. For instance, Clark and Senik (2010) study only income comparisons while Friehe et al. (2018) look only at gross labor income comparisons. None of the two papers provide any detail about the context of the comparisons.

Our study looks at both household income and individual labor income comparisons for the same individuals, and does so in two different situations: in a context of a decrease in household income and of a (possible) increase in individual labor income. This allows us to study whether individual comparisons differ for different outcomes and whether they are context-dependent. However, given the structure of the questions, we cannot separately identify the effects of studying a different outcome from that of using a different setting.

The bottom-left quarter of each panel in Figure 4 shows correlations between intensity scores across the two scenarios, for mothers (panel (a)) and children (panel (b)). The diagonal of this matrix shows that individuals do not report the same intensity for the same comparison groups in both scenarios (perfect consistence would be shown in the diagonal being equal to 1). Notwithstanding this, the correlations shown in the diagonal are positive and sizable, which suggests a certain consistency in the answers. We also observe that the correlation of reported intensity scores between different comparison groups is larger when the comparison corresponds to the same scenario than when they apply to different scenarios (see Figure 3 and 4).

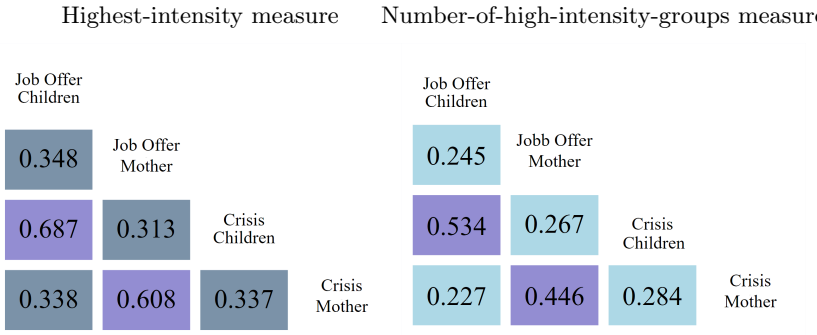
Figure 4: Correlations between comparison groups. Job Offer and Economic Crisis



Note: Colors indicate the size of the correlation: gray when it is less than 0.1; light blue when it is between 0.1 and 0.3, lilac if it is between 0.3 and 0.4; and blue-violet if it is greater than 0.4. All coefficients are significant at 1%. Source: ELBU.

Next we examine the relationship between the highest intensity reported across all groups by mothers and children in both scenarios. As Figure 5 shows, in the Highest-intensity measure, the largest correlations (about 0.6) are between answers of the same type of respondent across scenarios (for instance, children in the Job Offer and children in the Economic Crisis scenario). Correlations between mothers and children are much lower (about 0.3), irrespective of the scenario. The correlations are slightly lower for the number-of-high-intensity-groups measure. For example, in the case of the same respondent between scenarios, it is around 0.5.

Figure 5: Correlation of intensity scores. Mothers and Children, Job Offer and Economic Crisis



Note: Colors indicate the size of the correlation: gray when it is less than 0.1; light blue when it is between 0.1 and 0.3, lilac if it is between 0.3 and 0.4; and blue-violet if it is greater than 0.4. All coefficients are significant at 1%. Source: ELBU.

Using the number-of-high-intensity-groups measure, Table 1 above suggests that individuals use different comparison groups depending on the scenario they face: Labor-related groups are more predominant in the set up where individuals have to decide about their labor income and social groups are more important when individuals face a fall in household income. Table 2 provides further evidence about this. When we examine the percentage of individuals who report lower, the same, or higher intensity in one scenario than in the other, we find out that a larger share of individuals compare with higher intensity with labor-related groups when they have to decide about their labor income and a larger share of individuals compare with higher intensity with social groups when they face a fall in household income. This is true both for mothers and children. It is also worth noting that it is always a minority of individuals who report different intensity across both scenarios. More than half the individuals report the same intensity score in both scenarios.

Table 2: Share of individuals reporting different or the same intensity scores, by comparison group. Mothers and children. Job Offer and Economic Crisis

	Job Offer		Same	Economic Crisis		Total
	4 or more	1 - 3		1 - 3	4 or more	
(a) Mothers						
Friends	1.08	4.00	58.46	14.00	22.46	100.0
Neighbors	-.-	1.38	73.23	13.08	12.31	100.0
Family	-.-	0.92	46.77	14.46	37.85	100.0
Same profile	4.00	6.92	59.23	13.85	16.00	100.0
Union	2.00	3.08	65.38	12.77	16.77	100.0
Highest-intensity measure	1.38	5.54	56.31	19.08	17.69	100.0
(b) Children						
Friends	8.15	9.38	57.69	10.62	14.15	100.0
Neighbors	3.23	7.38	76.00	7.85	5.54	100.0
Family	3.54	5.85	53.69	12.92	24.00	100.0
Same profile	17.23	14.46	52.62	9.08	6.62	100.0
Union	11.54	9.08	62.92	8.00	8.46	100.0
Highest-intensity measure	9.69	14.15	55.23	13.08	7.85	100.0

Note: The columns report the share of individuals whose reported intensity scores for one same comparison group differ across both scenarios by the amount indicated in the heading of the column. Columns 2 and 3 refer to cases where the score is larger in the Job Offer scenario than in the Economic Crisis scenarios, while columns 5 and 6 refer to the opposite cases. Source: ELBU.

In sum, individuals compare with different groups and with different intensity depending on the situation. In spite of this, to facilitate the presentation, in what follows we explore the intergenerational transmission of comparison groups using the Economic Crisis scenario and present results for the Job Offer scenario in the Annex. This decision is also supported by the mentioned results that the Economic Crisis responses provide consistent information for all mother and children, irrespective of their employment status.

3 Empirical strategy

3.1 Are reference groups endogenous? The role of intergenerational transmission

Intensity We use different strategies to estimate the intergenerational transmission of the intensity of comparisons for the three measures of intensity described in Section 2.2. A potential concern when estimating the intergenerational transmission is that part of the possible correlation between mothers' and children's intensity (or direction) may be due to family-specific factors, such as neighborhood effects or shared external shocks, which we do not observe. These unobservables are different from the intergenerational transmission mechanism we seek to estimate and may thus bias our estimates. To mitigate this omitted variables problem, we use two different empirical strategies that control for family-specific characteristics (i.e. factors that mothers and children of the same family share) in our estimations. Both strategies exploit that each child/mother pair reports information on intensity and direction several times –as they report intensity and direction for each one of the reference groups we consider, if answers are complete.

Since we only have one observation per mother/child pair of the highest-intensity and the number-of-high-intensity-groups measures, a first empirical strategy estimates first family fixed effects (F_h) using the intensity measure for the mother and the child (see equation (1)), and then includes the predicted family fixed effects from the first stage equation into an intergenerational transmission equation (2).

$$Int_{i,h} = F_h + \mu_{i,h} \tag{1}$$

where $Int_{i,h}$ denotes either the highest-intensity or the number-of-high-intensity-groups measures, $i = \{ch, m\}$ refers to the child (ch) or the mother (m), and h refers to the family.

$$Int_{ch} = \beta \cdot Int_m + \varsigma \cdot X_{ch} + \sigma \cdot X_h + \alpha \cdot X_m + \widehat{F_h} + \epsilon_{ch} \tag{2}$$

Our parameter of interest is β, which captures the intergenerational transmission (or the intergenerational persistence coefficient) of comparison intensity between mothers and children. A β of zero means that there is no transmission from mothers to children of intensity in comparisons while a β of one implies perfect transmission, i.e. on average children compare with the same intensity as their mothers. Besides predicted family fixed effects, $\widehat{F_h}$, regression (2) controls for a set of maternal variables, X_m, that include educational level, marital status, and age, a set of children's variables, X_{ch}, that include educational level, ethnic ancestry, personality traits, place where children report having met their main friends (neighborhood, educational institution, or other places), whether children are emancipated, and sex, and household variables, X_h, that include the log of per capita household income and region of residence. We discuss the regression estimates in Section 4.1.

In order to size the bias we would introduce if we did not control for the unobservable family-specific variables in equation 2, we estimate the intergenerational transmission coefficient from an specification

similar to equation (2) with all the observable controls but without family-specific fixed effects. This equation is analogous to the specifications used to estimate the intergenerational income elasticity.

The second empirical strategy we use to control for family-specific heterogeneity exploits the availability of multiple responses from each child/mother pair. In this case, we directly use the fixed effect model described in equation (3) to obtain a single estimate of the intergenerational transmission of intensity of comparisons across all reference groups.

$$Int^c_{ch} = \beta' \cdot Int^c_m + F_{ch} + \epsilon'_{ch} \tag{3}$$

where c is the reference group.

Now, the parameter β' measures the mother-children transmission that is not explained by shared family characteristics. Since Int^c_{ch} varies within each individual across all references groups, we refer to it as "Intensity" when we present the results in Section 4.1. Note that the fixed effects in equation (3) do not permit identifying the impact of individual-specific covariates, as these are constant within individuals. They are thus not included in the regression.

Direction To examine whether mothers transmit the groups they like to compare with down to their children, we estimate equation (2) for each comparison group c. Now the dependent variable is the child's report about how much she compares with group c. As in (2), the specification also includes family fixed effects, which are estimated from the first stage equation (4). We thus run 5 regressions, one per reference group.

Since now the intergenerational transmission is estimated for each comparison group, it is not possible to include individual fixed effects, as we did in equation (3). However, an alternative way to net out the effect of the individual-specific unobservable variables is to work with deviations from the individual mean. This is what we do to estimate equations (4) and (5), where we transform the direction variable by subtracting the average individual score across all groups from the individual score of each group, $\tilde{Dir}^c_i = Dir^c_i - \frac{1}{5} \cdot \sum_c Dir^c_i$.

$$\tilde{Dir}^c_{i,h} = F^c_h + \eta_{i,h} \tag{4}$$

$$\tilde{Dir}^c_{ch} = \beta'' \cdot \tilde{Dir}^c_m + \varsigma' \cdot X_{ch} + \sigma' \cdot X_h + \alpha' \cdot X_m + \widehat{F^c_h} + \epsilon'_{ch} \tag{5}$$

Equation (5) includes the same controls as equation (2). We discuss the estimates of these regressions in Section 4.2.

3.2 Estimation procedure

Our baseline estimates are based on Ordinary Least Squares in equation (2) and (5) with robust standard errors. We use individual fixed effect in equation (3). In this case, standard errors are clustered at family level. They are presented in Section 4. Our estimation sample includes mothers and children with non-missing information for all the variables that enter the regressions. The estimation sample includes 648 observations (3,240 in the individual fixed effect estimation, corresponding to the five intensity reports). We do not claim causality as our OLS estimates of the β's in equations (2) and (5) may face endogeneity problems due to issues of measurement error in parents' responses about their comparisons, reverse causality, or the omission of relevant variables. Having said this, in Section

5 we present strategies to mitigate these potential concerns.

4 Results

We present our results in three subsections. First, we discuss average intergenerational transmission estimates of intensity (section 4.1) and direction (section 4.2) of comparisons, and then we explore sources of heterogeneity in the transmission effects (section 4.3) —we look at sex, income, and region.

4.1 Intergenerational transmission: intensity of comparisons

This section explores the intergenerational transmission of the intensity of interpersonal comparisons using equations (2) and (3), and direct responses from both generations: mothers and their children. The estimated coefficients are presented in Table 3 and Table A2 in the Annex. The estimates of the persistence coefficients are based on the contemporaneous responses of the mother.

Table 3 shows that the intensity of comparisons of mothers is a relevant factor to explain their children's intensity of comparisons. This result holds for the three measures of intensity we employ. The coefficient estimate is 0.380 for the intensity measure, 0.314 for the highest-intensity measure and 0.251 for the number-of-high-intensity-groups measure. They are all statistically significant at 1% level. The results are robust to the inclusion or exclusion of controls.[4]

Family fixed effects are shown in Table A2 in the Annex. They are statistically relevant when we use the highest-intensity measure but not when we use the number-of-high-intensity-groups measure. Regardless of the importance of family fixed effects, intergenerational persistence estimates are similar to the estimates without family fixed effects, which we also report in Table A2 in the Annex. The small differences in point estimates are not statistically significant, as shown in the p-values reported in the Table. This suggests that the intergenerational persistence coefficient is explained by mothers' preferences and it is not driven by shared characteristics at household level.

The size of our estimated coefficients on intergenerational persistence of comparison intensity is similar to the estimated transmission of other preferences. For example, using a similar sample of the ELBU, Leites and Salas (2019) find a similar intergenerational persistence of preference for redistribution. Our estimates are also comparable with the estimates of Dohmen et al. (2012) about the intergenerational transmission of risk attitudes and trust, and are larger than those found by Giavazzi et al. (2019), who study the intergenerational transmission of a set of preferences and attitudes for US immigrants.

[4]We check the robustness of the results with different specifications. For the intensity measure (equation (3)), we include fixed effects associated with each comparison group (see Table A3 in the Annex). With this specification, transmission from mothers to children remains highly significant, with the intergenerational transmission coefficient being 0.282. We make other specifications that we do not include in the text for space constraints. First, we estimated equation (3) using random effects. In this case, the intergenerational transmission coefficient is 0.364, located at intermediate levels between OLS estimation and individual fixed effects. Then, we perform tests using the individual fixed effects obtained in equation (3) in the first stage, including then in equation (2). As a result, we obtain that the transmission in the intensity is greater than in the cases where the estimation is made with OLS or when family fixed effects are included (0.344 in the Highest-intensity measure and 0.322 in the Number-of-high-intensity-groups measure).

Table 3: Intergenerational transmission of intensity of income comparisons. Crisis scenario

	Intensity measure		Highest-intensity measure		Number-of-high-intensity-groups measure	
Mother's response:	0.335***	0.380***	0.322***	0.314***	0.260***	0.251***
Intensity as the offspring	(0.028)	(0.024)	(0.037)	(0.039)	(0.050)	(0.051)
Observations	3,240	3,240	648	648	648	648
R^2	0.114	0.143	0.120	0.132	0.083	0.097
Individual Fixed Effects	No	Yes	No	No	No	No
Family Fixed Effects	No	No	Yes	Yes	Yes	Yes
Other controls	No	No	No	Yes	No	Yes
Dependent variable:						
Mean	3.459		5.792		0.807	
SD	3.217		3.551		1.160	

Notes: This table shows estimates of equations (2) and (3). Estimates of the Other control variables included in the regression are reported in Table A2 in the Annex: log of per capita household income, highest educational level, gender, ethnic minority, emancipated, employment, Montevideo, BFI, and Meets 1st friend. Dependent variable: Highest-intensity measure - largest score reported across all groups (friends, neighbors, family, people with the same professional profile and workers from the same union); Number-of-high-intensity-groups measure - number of reference groups for which individuals report an intensity larger than 7.*Significant at 10%, **significant at 5%, ***significant at 1%. Standard errors in parentheses

Even though our OLS regressions control for a wide set of covariates, none of the control variables shows a statistically significant effect on children's intensity of comparisons, except for children who are emancipated, who report higher intensity. This lack of impact of controls on children's intensity of comparisons, however, is not driven by a possible correlation between these controls and mothers' intensity of comparisons, for when we exclude the intensity variable of the mother from our specification, results remain largely unchanged (see Table A2 in the Appendix). In this case, only the agreeableness dimension of BFI is significant (at 5%) and positive for both measures. Household income is slightly significant and positive, but only for the Highest-intensity measure.[5]

4.2 Intergenerational transmission: direction of comparisons

Now we focus on the transmission of the direction of comparison groups (the relevant benchmarks) from mothers to children. To this end, we estimate equation (5) for each one of the five reference groups. Table 4 shows the result for the Crisis Scenario. In Tables A5 and A6 in the Appendix, we report full estimates for each comparison group in both scenarios. Recall that the dependent variable is now the standardized individual score for the relevant reference group.

The positive and significant estimates in Table 4 indicate that there is intergenerational transmission of reference groups. In other words, the groups mothers choose to compare with are related to the groups their children compare with. The transmission of reference groups is not the same for all groups, as persistence estimates are larger for Family (0.396) and Neighbors (0.323). Our estimates,

[5]Our estimation sample includes only mothers as we have a very reduced number of fathers in the sample, only 70 of them. Table A4 in the Annex shows that the correlation between the intensity of comparison of fathers and their children is larger (about 0.50, significant at 1%) than the estimated one for mothers. At face value, this would suggest that the transmission of intensity of comparisons is larger for fathers than for mothers. However, this result should be taken with caution as our sample of fathers is very likely to be self-selected, possibly with fathers that devote more raring time to their children, and this may be correlated with the transmission effect we are estimating. Since, we do not have information to correct for this sample selection of fathers, we have dropped them from our estimation sample. Such self-selection is unlikely to occur among mothers, as our sample contains a large proportion (85%) of the universe of mothers whose children attended the first year of public school in Uruguay in 2004.

thus, provide evidence that supports the idea that the selection of reference groups is partly exogenous, as mother's preferences condition their children's choices.[6]

Some authors argue that finding comparison groups to depend on individual characteristics is indicative that the former are partly endogenous (Falk and Knell, 2004; Clark and Senik, 2010). We include a rich set of covariates in our regressions and find very limited support for this argument, as most of our control variables are not statistically significant. Only two personality traits (agreeableness and conscientiousness) show significant effects on some of the groups. Some covariates are significant for specific groups, for example, sex in Family, region of residence in Union, and household income in Neighborhood. Even more, the family fixed effects are only statistically significant when the comparison group is the neighbors. This, however, does not have any bearing on the estimated intergenerational persistence, as the corresponding p-values at the bottom panel of this Table show. In addition, the size of the estimated persistence coefficients for the other reference groups remain unchanged when we add the family fixed effect. Once again, this suggest that the relevance of mother transmission is not driven by shared family characteristics at household level. When we exclude the mother's response regarding the direction of the reference group, there are no changes in the significance of the covariates (see Tables A5 and A6 in the Annex).

Since two of the five reference groups individuals can choose from are related to the labor market (i.e. Same Profile and Union), the intergenerational transmission of reference groups may differ according to the labor status of the mother. To check this, Table A8 in the Annex presents estimates of equation (5) for each reference group by mother's employment status. We find that intergenerational persistence estimates are not always larger for employed mothers, implying that the transmission of labor-related reference groups is not always larger when mothers are employed. Transmission of labor-related groups is larger in the Economic Crisis scenario, but then transmission is also larger for social groups. Results are less clear in the Job Offer scenario, where transmission is larger among employed mothers when the reference groups is individuals from the same Union, but is smaller when it comes to individuals with the same labor market profile (i.e. same experience and qualifications). Note however that given the small sample sizes, differences across subsamples are usually not statistically significant.[7]

In sum, we find strong evidence of intergenerational transmission of reference groups, as mothers' choices and intensity affect with whom and how much their children compare. The maternal comparison groups are the only variables in our regressions that systematically affect the direction and intensity of children's comparison groups. This suggests that the formation of reference groups is partly exogenous. We also find little evidence on the possible sources of endogeneity in the formation of reference groups, as the vast majority of the covariates we include in the regressions, which comprise children's characteristics, maternal characteristics, and family variables, are not statistically significant. Only some personality traits of children are relevant, and they are so for some reference groups only.

The results we have reported so far are average effects. In the next section, we explore whether the intergenerational transmission of reference groups differs by relevant population subgroups.

[6]Recall that our estimation sample includes mothers only, as the reduced sample of fathers available in the ELBU is likely to be self-selected. This notwithstanding, we show results for the sample of fathers in Table A4 in the Annex. Results indicate that the transmission from fathers to their children is only present for three of the five groups (Neighbors, Family, and Same Profile), but in these three cases persistence is larger than the estimated persistence from the sample of mothers.

[7]When we summarize all the comparison scores into a single measure of intensity, we find that the intergenerational persistence of intensity comparisons is larger for non-employed than for employed mothers. Note however that given the small sample sizes, differences across subsamples are usually not statistically significant –see Table A7.

Table 4: Intergenerational transmission of direction of income comparisons. Crisis scenario

	Social groups						Labor-related groups			
	Friends		Neighbors		Family		Same profile		Union	
Mother's response:										
Direction	0.138***	0.149***	0.344***	0.323***	0.424***	0.396***	0.201***	0.197***	0.231***	0.211***
as the offspring	(0.050)	(0.050)	(0.049)	(0.050)	(0.042)	(0.041)	(0.043)	(0.042)	(0.041)	(0.043)
Observations	648	648	648	648	648	648	648	648	648	648
R^2	0.017	0.053	0.108	0.132	0.191	0.243	0.048	0.091	0.061	0.082
Family Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Dependent variable:										
Mean	0.074		-1.419		0.693		0.973		-0.321	
SD	1.723		1.813		2.319		2.223		1.853	

Notes: This table shows estimates of equation (5). Estimates of the control variables included in the regression are reported in Table A5 in the Annex. They are the same that we indicated in Table 3. Dependent variable: Standardized individual scores. *Significant at 10%, **significant at 5%, ***significant at 1%. Standard errors in parentheses

4.3 Heterogeneity in the formation of reference groups

Previous work indicates that the gender of the parent and of the offspring matters in the intergenerational transmission of certain preferences and tastes. This literature emphasizes on the influence of nurture in the formation of gender identities and the importance of intergenerational transmission for gender attitudes and behaviors (Bütikofer, 2013; Farré and Vella, 2013; Morrill and Morrill, 2013; Fernández and Fogli, 2009; Fernández et al., 2004). Another strand of the literature documents differences in the intergenreational correlation between sex. For instance, Lundberg (2005) finds that parents tend to invest more in children of the same sex, which would lead to a higher correlation in achievements in the labor market. However, the evidence on this point is ambiguous, and suggest that the results of sons and daughters are correlated with the abilities of both the father and the mother (Gronqvist et al., 2017).

We first explore whether the transmission of reference groups is more pronounced between mothers and daughters or between mothers and sons. Then, we analyze if there are heterogeneous results according to household income, and region of residence. To this end, we estimate the intergenerational transmission of intensity (eqs. (2) and (3)) and direction (eq. (5)) of the comparisons for daughters and sons separately. We do the same for individuals below and above-median income, and for the capital city (Montevideo) and the rest of the country.

Point estimates of the intergenerational transmission of intensity are higher for daughters than for sons –see Table 5. The difference is economically and statistically relevant when using the intensity measure. The intergenerational transmission is 33% higher among daughters than among sons. However, the difference in means tests shows that the difference in point estimates for the other two measures of intensity cannot be taken at face value, as we cannot reject the null hypothesis that both estimates are equal.

The transmission of intensity does not seem to differ by income levels. Only the highest-intensity measure shows larger persistence estimates among low income individuals. Differences for the other two intensity measures across income groups are small in size and statistically insignificant.

We also find the intergenerational transmission of intensity to be larger outside the capital city, Montevideo. This result holds for the three intensity measures we use.

Table 6 reports transmission estimates of direction by sex, income, and region. By looking at the transmission for each one of the reference groups separately we can see which reference groups drive the results we find for intensity, which are based on summary measures of individual reported comparison for each one of the five reference groups. The larger intergenerational transmission we reported above for daughters is the result of this transmission being larger for all reference groups.[8]

[8]Differences of transmission is smaller for the reference groups of Friends and Family, and given the small sample sizes, they are not statistically significant.

Table 5: Intergenerational transmission of intensity of income comparison by income, region, and sex of children. Crisis Scenario

	Sex		Income		Region	
	Daughter	Son	High	Low	Montevideo	Other
Intensity measure - Individual Fixed Effect						
Mother response:						
Intensity	0.435***	0.319***	0.378***	0.382***	0.339***	0.416***
as the offspring	(0.023)	(0.023)	(0.023)	(0.023)	(0.024)	(0.022)
Difference of means tests: Are the estimates different?						
p-values	0.016		0.938		0.112	
Observations	1,660	1,580	1,615	1,625	1,380	1,860
R^2	0.180	0.105	0.140	0.146	0.126	0.158
Dependent variable:						
Mean	3.455	3.463	3.259	3.658	3.551	3.391
St. dev.	3.216	3.219	3.160	3.261	3.256	3.186
Highest-intensity measure - Family Fixed Effect						
Mother response:						
Intensity	0.342***	0.275***	0.259***	0.379***	0.253***	0.375***
as the offspring	(0.051)	(0.056)	(0.054)	(0.052)	(0.057)	(0.050)
Difference of means tests: Are the estimates different?						
p-values	0.373		0.111		0.104	
Observations	332	316	325	323	276	372
R^2	0.175	0.150	0.107	0.194	0.160	0.180
Dependent variable:						
Mean	5.955	5.620	6.120	5.461	5.833	5.761
St. dev.	3.532	3.569	3.401	3.671	3.541	3.563
Number-of-high-intensity-groups measure - Family Fixed Effect						
Mother response:						
Intensity	0.311***	0.211***	0.297***	0.218***	0.145**	0.314***
as the offspring	(0.069)	(0.067)	(0.077)	(0.065)	(0.066)	(0.064)
Difference of means tests: Are the estimates different?						
p-values	0.324		0.434		0.067	
Observations	332	316	325	323	276	372
R^2	0.152	0.124	0.115	0.124	0.133	0.149
Dependent variable:						
Mean	0.816	0.797	0.871	0.743	0.764	0.839
St. dev.	1.096	1.225	1.205	1.111	1.131	1.182

Notes: Estimates of the Highest-intensity measure and Number-of-intensity-groups measure include controls. The controls used are the same that those we reported in Table A2 in the Annex. The p-values show the test of equal coefficient estimates between groups. *Significant at 10%, **significant at 5%, ***significant at 1%. Standard errors in parentheses

Table 6: Intergenerational transmission of the direction of income comparisons by income, region and sex of children. Crisis scenario. Estimates with family fixed effect

	Friends		Neighbors		Family		Same profile		Union	
(a) By sex of children:	Daughter	Son	Daughter	Son	Daughter	Son	Daughter	Son	Daughter	Son
Mother's response:	0.183**	0.111*	0.430***	0.215***	0.430***	0.356***	0.256***	0.129**	0.311***	0.119**
Direction as the offspring	(0.075)	(0.059)	(0.057)	(0.081)	(0.057)	(0.058)	(0.057)	(0.061)	(0.063)	(0.061)
	Difference of means tests: Are the estimates different?									
p-values	0.450		0.029		0.361		0.128		0.025	
Observations	332	316	332	316	332	316	332	316	332	316
R^2	0.091	0.051	0.216	0.123	0.252	0.252	0.131	0.105	0.134	0.076
Dependent variable:										
Mean	-0.082	0.239	-1.407	-1.441	0.945	0.432	0.918	1.037	-0.374	-0.267
St. dev.	1.747	1.690	1.755	1.877	2.447	2.157	2.345	2.096	1.916	1.791
(b) By household income:	High	Low	High	Low	High	Low	High	Low	High	Low
Mother's response:	0.194***	0.078	0.310***	0.353***	0.391***	0.406***	0.160***	0.235***	0.169***	0.269***
Direction as the offspring	(0.054)	(0.079)	(0.070)	(0.068)	(0.055)	(0.060)	(0.057)	(0.059)	(0.057)	(0.064)
	Difference of means tests: Are the estimates different?									
p-values	0.225		0.660		0.848		0.364		0.247	
Observations	325	323	325	323	325	323	325	323	325	323
R^2	0.129	0.055	0.130	0.142	0.261	0.241	0.077	0.146	0.093	0.096
Dependent variable:										
Mean	0.145	0.004	-1.646	-1.201	0.745	0.644	1.084	0.867	-0.329	-0.315
St. dev.	1.600	1.844	1.864	1.738	2.368	2.278	2.221	2.229	1.901	1.811
(c) By region:	Mvdeo	Other	Mvdeo	Other	Mvdeo	Other	Mvdeo	Other	Mvdeo	Other
Mother's response:	0.143*	0.159**	0.354***	0.308***	0.281***	0.499***	0.148**	0.172***	0.172***	0.260***
Direction as the offspring	(0.076)	(0.062)	(0.076)	(0.066)	(0.058)	(0.058)	(0.059)	(0.058)	(0.060)	(0.059)
	Difference of means tests: Are the estimates different?									
p-values	0.867		0.649		0.008		0.779		0.300	
Observations	276	372	276	372	276	372	276	372	276	372
R^2	0.082	0.065	0.172	0.120	0.199	0.338	0.138	0.118	0.085	0.107
Dependent variable:										
Mean	0.000	0.130	-1.521	-1.351	0.609	0.759	0.935	1.006	-0.022	-0.545
St. dev.	1.772	1.691	1.864	1.776	2.368	2.289	2.064	2.341	1.898	1.793

Notes: Estimates include controls. The controls used are the same that those we reported in Table ?? in the Annex. The p-values show the test of equal coefficient estimates between groups.*Significant at 10%, **significant at 5%, ***significant at 1%. Standard errors in parentheses

Differences in transmission of reference groups, reported in panel (b), are not statistically significant by income levels, which is consistent with our findings that transmission of intensity does not differ by income levels.

Finally, the larger transmission of intensity that we find outside the capital city is driven by the reference group of family members. Differences in estimates are smaller and statistically insignificant for the other four groups –see panel (c) in Table 6.

5 Sensitivity analysis and robustness checks

Without additional assumptions about the behavior of the error term conditional on our observed control variables, in equations (2) and (5), the estimated persistence parameters cannot be interpreted as representing a causal relationship between mother and children. In this sense, the estimated coefficients represent the best linear prediction of the child's responses. Some endogeneity problems may threaten the intergenerational persistence coefficient estimates obtained through the OLS regressions reported thus far. The source of such bias may be related to measurement error, reverse causality, or omitted variables.

In section 5.1, we discuss the implications of measurement error and present an exercise that specifically addresses this issue. In section 5.2, we present an instrumental variable strategy, which addresses the three sources of biases and provides consistent estimates. Finally, in section 5.3, we address problems of spurious correlation.

5.1 Alternative measures to address issues of consistency of mother's responses: Clark and Senik question

A first objection that could be raised to our empirical strategy is that the variables we use to capture the intensity and direction of comparisons may have some measurement error issues. For instance, respondents may not fully understand our question or they may incorporate some type of bias in their responses (e.g. they do not pay attention or provide strategic responses, as in the context of happiness literature – see van Praag and Ferrer-i Carbonell (2008)). If so, our measures of intensity and direction of comparison would be measured with error. If we assume classical measurement error in the mother and children responses, our estimates of the intergenerational persistence of reference groups would be downward biased. Alternatively, if the measurement error terms of mothers and children are positively correlated, our estimates of intergenerational persistence of reference groups could be upward biased. However, this problem seems implausible because the surveys of children and parents were carried out at different times and in different places (they did not share physical space), so we do not expect the error terms to be correlated.

Yet, another possibility is that the framing of the questions causes the same type of error in the responses of parents and children. To mitigate this potential problem we estimate the intergenerational association using the questions originally used by Clark and Senik (2010), for mothers. This strategy avoids the potential problem of correlation of the error terms of mothers and children due to the framing of the question. Figure A1 in the Annex compares the distribution of this question in the ELBU and in the European sample used in Clark and Senik (2010).[9] Our questions allow for the collection of

[9]Clark and Senik (2010) used two questions: a) How important is it for you to compare your income to others? Answers range on a scale from 0 (not important at all) to 6 (very important). In the ELBU, the response range is more limited, from 1 to 5. To measure direction of comparisons, they used the following question: Which persons are you

information for a large percentage of individuals who declared not to compare themselves when using the Clark and Senik questions in the ELBU. For example, more than 30% of mothers indicate that when faced with a salary offer, they are compared with people of the same profile; in that group, more than half stated that they do not compare when we use question of Clark and Senik. [10]

To alleviate concerns about measurement error, we estimate the intergenerational transmission equation (2) substituting our measure of mother's comparisons intensity for the intensity measure by Clark and Senik (2010), RG_m^{c-s}. That is, we estimate the following regression: $Int_{ch} = \beta \cdot RG_m^{c-s} + \varsigma \cdot X_{ch} + \sigma \cdot X_h + \alpha \cdot X_m + \widehat{F_h} + \epsilon_{ch}$.[11]

Since it seems implausible to assume that the measurement error of both variables is correlated, finding a positive β parameter would suggest that the correlation between mothers' and children's intensity is explained by factors other than measurement error, possibly the intergenerational transmission of reference groups.

The results reported in columns (1) and (3) of Table 7 corroborate the strong, significant, and positive intergenerational persistence we find with our measure of intensity –see Section 4.1. This suggests that our β estimate does not suffer from serious error measurement problems.

Table 7: Intergenerational transmission of income comparison intensity with Clark and Senik's (2010) measures. Crisis Scenario. Estimates with family fixed effect

	Highest-intensity measure		Number-of-high-intensity-groups measure	
	(1)	(2)	(3)	(4)
Mother's response: Clark and Senik's questions				
Intensity	0.642**	0.368	0.190**	0.144
	(0.282)	(0.271)	(0.095)	(0.092)
Mother's response: Our (ELBU) questions				
Intensity		0.309***		0.246***
as the offspring		(0.039)		(0.051)
Observations	648	648	648	648
R^2	0.035	0.133	0.032	0.100

Note: The control variables are the same as in Table A2 in the Annex. Dependent variable: Highest-intensity measure - largest score reported across all groups; Number-of-high-intensity-groups measure - number of reference groups for which individuals report an intensity larger than 7. Clark and Senik intensity: dummy equal to 1 if the income comparison intensity reported with the question used in Clark and Senik (2010) is greater than 1. On a Likert scale from 1 to 5, 54.94% of the mothers report an income intensity comparison of 1 with this measure. *Significant at 10%, **significant at 5%, ***significant at 1%. Standard errors in parentheses

Next, in addition to Clark and Senik's intensity measure, we also include our measure in the regression. We report the key estimates of this augmented specification in columns (2) and (4) of Table 7. Since both measures capture the same phenomenon and the dependent variable (i.e. children's

more likely to compare your income to? The following response options were offered: coworkers, family members, friends, someone else, I do not compare. The same categories are used in the ELBU. Both questions (intensity and direction) are found in waves 3 and 4 of the ELBU.

[10]The distribution of the responses arising from the Clark and Senik (2010) work is also compared with the Job Offer and Economic Crisis scenarios. In this case, the answers obtained to these last questions are grouped in seven categories so that the response path is the same as in Clark and Senik (2010). The Job Offer and Economic Crisis scenarios collect greater intensity at the extremes (values of 0, 5, and 6) to the detriment of intermediate values (see Figure A2 in the Annex). Unfortunately, we cannot build one-to-one relationships between both questions when considering the direction of comparisons.

[11]Mothers report the reference groups they compare with using Clark and Senik's question twice in the ELBU, in the third (2011/12) and fourth waves (2016/17). The estimates reported in Table 7 use the average of both waves.

intensity) is our measure of intensity, we expect our measure of intensity to be significant in detriment of the significance of Clark and Senik's measures. Results show that this is indeed the case.

5.2 Instrumental variable

As a complementary strategy, we use instrumental variables to examine potential measurement errors. As it is well known, measurement error leads to attenuation bias. The size of the bias depends on the amount of information of the true variable which is available in the observed variable. We follow the Obviously Related Instrumental Variables (ORIV) model (Gillen et al., 2019),[12] which assumes that the variables are measured with independent i.i.d. error, and that there are two alternative measures of the explanatory variable with i.i.d. error and constant variance. Under these assumptions the authors demonstrate that the second measure of the explanatory variable can be used as instrument in order to mitigate attenuation bias. ORIV yields consistent coefficients and standard errors. In our context, we treat our mother's intensity comparison measures in the Economic Crisis scenario as endogenous variables and some closely-related survey measures as their corresponding instrumental variable. In particular, we use as an instrument the mother's response regarding the Job Offer. As mentioned, both comparison variables (under Job offer and Economic Crisis) are highly correlated and could be measured with error. This approach assumes that the measurement error of Job offer and Crisis variables are independent of each other, and that errors have the same variance. The idea is that the related noisy measure of the endogeneous variable can be used to recover a consistent estimate of the true transmission coefficient.

Table 8 presents the results for children's intensity of comparison, and in Table A9 in the Annex, we show the first stage of this estimation. Dependent variables are our measure of intensity: Highest-intensity measure and Number-of-high-intensity-groups measure. All regressions include the same control variables used in the previous section. For comparison purposes, OLS estimates are also reported. To evaluate the instruments weakness and the potential bias, we follow Bound et al. (1995) and carry out a joint significance test of the instruments in the two stages method ancillary equation.[13]

Our results are robust and remain significant in our instrumental variable estimations. IV estimates are larger than the OLS ones, indicating that OLS estimates underestimate the role of intergenerational transmission. Moreover, if we assume exogeneity of the instruments (which is more plausible for the Higher-intensity measure, that shows an F-test of 18.12, and less plausible for the Number-of-high-intensity-groups measure, that shows an F-test of 8.60), these results provide evidence of a causal relationship from parental preferences to their offspring reference group preferences.

We also estimate the direction of the comparisons using ORIV. As before, our instrument for the mother's comparison report in the Economic Crisis scenario is her report in the Job Offer scenario. When our instruments seem not to be weak (i.e. F-test $>$ 10), the estimates in Table 9 show that the IV estimates of the intergenerational transmission of the direction of comparisons are considerably larger than the OLS estimates –around 25% for Union and Neighbors, and 75% for Same Profile (Annex Table A10 shows estimates of the first stage regression).

[12] Gillen et al. (2019) suggest this approach for dealing with measurement error in the context of experimental laboratory based measures. They use duplicate elicitations of the variables with measurement error as instruments.

[13] Cameron and Trivedi (2005) point out that values of the F-statistic below 10 confirm instrument weakness and bias problems.

Table 8: Intensity of income comparison. Crisis scenario. Children. Estimates with family fixed effect and instrumental variables

	Highest-intensity measure		Number-of-high-intensity -groups measure	
	OLS	2SLS	OLS	2SLS
Mother's response: Intensity as the offspring	0.314*** (0.039)	0.481*** (0.062)	0.251*** (0.051)	0.526*** (0.114)
F-statistic for IV in 1st stage	-.-	18.12	-.-	8.59
Observations	648	648	648	648
R^2	0.132	0.100	0.097	0.012

Notes: The control variables are the same that we reported in Table A2 in the Annex. Dependent variable: Highest-intensity measure - largest score reported across all groups; Number-of-high-intensity-groups measure - number of reference groups for which individuals report an intensity larger than 7. *Significant at 10%, **significant at 5%, ***significant at 1%. Standard errors in parentheses

Table 9: Direction of income comparison. Children. Estimates with family fixed effect and instrumental variables

	Social groups						Labor related groups			
	Friends		Neighbors		Family		Same profile		Union	
	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS
Mother's response: Crisis scenario and direction as the offspring										
Direction	0.149*** (0.050)	0.227 (0.212)	0.323*** (0.050)	0.422*** (0.086)	0.396*** (0.041)	0.406*** (0.106)	0.197*** (0.042)	0.335*** (0.079)	0.211*** (0.043)	0.265*** (0.080)
F-statistic for IV in 1st stage	-.-	4.22	-.-	12.77	-.-	7.68	-.-	11.69	-.-	11.14
Observations	648	648	648	648	648	648	648	648	648	648
R^2	0.053	0.041	0.132	0.117	0.243	0.215	0.091	0.046	0.082	0.076

Notes: The control variables are the same that we reported in Table A5 in the Annex. Dependent variable: standardized income comparison for each group. *Significant at 10%, **significant at 5%, ***significant at 1%. Standard errors in parentheses

5.3 Estimates with randomized mother and household characteristics

The correlation we estimate in previous sections between mothers' and children's answers could be spurious, as they could, for instance, be driven by similarity in observable characteristics or by a life cycle effect (i.e. a correlation across generations rather than an effect between mothers and their children). To address this issue we obtain OLS estimates of the intergenerational persistence after randomizing mother's responses and family information. Dohmen et al. (2012) used a similar strategy to address whether the intergenerational correlation is driven by similarity in region characteristics.

We first substitute the intensity and direction of the mother's comparisons with a randomly assigned response from the pool of mothers, and run equations (2) for intensity and (5) for direction. We also run the same two equations where we randomize family information (i.e log of per capita income and place of residence), in addition to randomizing mother's answers.

Table 10 presents the results for intensity of comparison while Table 11 presents the results for direction of comparisons. Note that column (5) of Table 10 shows placebo estimates from the fixed effect model from the previous section. None of the intergenerational persistence estimates from the

placebo regressions that are reported in these two Tables are statistically significant. This suggests that our baseline estimates are not driven by the similarity in observable characteristics or by life cycle effects but capture the transmission of reference groups from mothers to children.

Table 10: Intensity of income comparison. Crisis scenario. Randomized mother and household characteristics.

	Highest-intensity measure		Number-of-high-intensity-groups measure		Intensity measure
	(1)	(2)	(3)	(4)	(5)
Randomized mother's response:					
Intensity	0.008	-0.021	0.062	-0.041	0.016
as the offspring	(0.038)	(0.038)	(0.040)	(0.032)	(0.023)
Observations	650	650	650	650	3,240
R^2	0.025	0.021	0.027	0.024	0.000
Randomized:					
Mother variables	Yes	Yes	Yes	Yes	Yes
Household variables	No	Yes	No	Yes	-.-

Notes: The control variables are the same as those in Table A2 in the Annex. Dependent variable: Highest-intensity measure is the largest score reported across all groups; Number-of-high-intensity-groups measure is the number of reference groups for which individuals report an intensity larger than 7. The dependent variable in the family fixed effects regression is children's intensity reports for each one of the five reference groups. *Significant at 10%, **significant at 5%, ***significant at 1%. Standard errors in parentheses

Table 11: Direction of income comparison. Crisis scenarios. Randomized mother and household characteristics

	Social groups						Labor related groups			
	Friends		Neighbors		Family		Same profile		Union	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Randomized Mother's response:										
Direction	0.011	0.028	0.028	0.025	-0.001	-0.002	0.030	-0.008	0.000	-0.008
as the offspring	(0.040)	(0.042)	(0.044)	(0.047)	(0.036)	(0.039)	(0.039)	(0.040)	(0.037)	(0.037)
Observations	650	650	650	650	650	650	650	650	650	650
R^2	0.033	0.032	0.043	0.029	0.085	0.083	0.048	0.049	0.034	0.025
Randomized:										
Mother variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household variables	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes

Notes: The control variables are the same as in Table A5 in the Annex. Dependent variable:Standardized income comparison for each group. *Significant at 10%, **significant at 5%, ***significant at 1%. Standard errors in parentheses

6 Final comments

This paper provides direct evidence for Uruguay about the anatomy of interpersonal comparisons, based on a group of questions specially designed to address this topic. First, it explores the intensity of interpersonal comparison: how much individuals compare their income and how many groups are chosen as reference groups. Second, it analyses the direction of the comparisons: who are selected as the reference groups. Finally, we address an important and less explored question: in what extend individuals choose their comparison group. It examines if reference groups are an individuals' socio-

cultural trait and provide evidence to test the role of family and social context in their determination. Specific we empirically test the role of intergenerational transmission of the reference group.

Our results confirm the relevance of the family context (labor experiences and educational achievements), both for our sample of mothers and children. We also demonstrate the relevance of some personality traits. The most surprising result is the strong association found between mothers and their offspring responses. Despite the broad set of variables considered in the econometric model, including alternatively fixed effects at the individual/household level, family and neighborhood context, as well as individual characteristics of the respondents, the mother's responses seem to be the critical factor. These results demonstrate the relevance of intergenerational transmission in the formation of the individual's reference group, in particular the key role of the mothers.

Finally, these results are robust to different specifications. The conclusions remain when we consider a more general model, simultaneously including a broad set of control variables, and an instrumental variable approach. We alternatively use different measures of intensity/direction of interpersonal comparison considering the responses of the question designed by Clark and Senik (2010). In the case of the mothers, this information is available in two waves, which allows us to exploit the longitudinal nature of our data. Finally, we carry out an instrumental variables estimation for intergenerational transmission. The relevance of the intergenerational transmission is confirmed both in terms of its statistical significance and the magnitude of the coefficient. Also, we find evidence about the role of personality traits and, to a lesser extent, racial ancestry.

Our result also suggests that in part, reference groups are exogenously determined thought the intergenerational transmission of preferences or attitudes. The reference groups also depend on some individual's characteristics. Furthermore, a part of the total variation of children responses is unexplained. Both aspects do not allow to rejection of the role of individuals in reference group selection. However, in this case, our result will enable us to confirm that their parents' preferences restrict individual selection.

The endogeneity or exogeneity of the reference groups is a crucial issue to understand the individual's preferences, aspirations, and behavior. Our findings confirm the role of intra-family transmissions in the formation of tastes, preferences, and attitudes, which could be relevant in other areas that transcend reference groups. They support the importance of social origin in explaining the heterogeneity of preferences for redistribution. Piketty (2000) and Bourguignon et al. (2007) emphasize this aspect to explain the persistence of inequality, arguing about the relevance of sociocultural inequalities and their effects through the transmission of preferences and beliefs. Note that the vertical socialization, through international transmission in part determines the reference groups. Also, the reference groups could have a crucial role in the formation of preferences through horizontal socialization. As a result, these mechanisms could generate mobility traps and also losses of efficiencies from aggregate well-being. Therefore, understanding how they work is relevant to advance towards a better understanding of the trade-off between inequality and efficiency, which becomes an appropriate input for the design of public policies.

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Appendix

Table A1: Labels and formulation of categories for Job Offer and Economic Crisis questions

Labels	a) Job Offer ... would you take into account, for your salary proposal, what ...	b) Economic Crisis ...if your income falls below the income ...
Union	.... the union to which I belong negotiated	... of your union workers
Friends	... your friends earn	... of your friends
Same profile	... people with the same experience and qualification earn	... of people who have the same experience and qualification
Neighbors	... your neighbors earn	... of your neighbors
Families	... your relatives earn	... of your family
Does not compare	I would not compare with anyone	My conformity would not be affected

Note: The Job Offer scenario is: *Imagine that you get an offer of a permanent full-time job that you like. Your potential employer asks you to indicate the wage you are willing to receive. For each of the following items, please indicate on a scale from 1 to 10 (where 1 is very little and 10 is a lot) how true it is that you would consider in your proposal....* The Economic Crisis scenario is: *Imagine that there is an economic crisis and your household income is reduced. Indicate on a scale from 1 to 10 (where 1 is very little and 10 is a lot), how true it is that your economic satisfaction would be affected if your income falls below income ...*

Table A2: Intergenerational transmission of intensity of income comparisons. Full estimation

	Crisis Scenario						Job Offer Scenario					
	Highest-intensity measure			Number-of-high-intensity-groups measure			Highest-intensity measure			Number-of-high-intensity-groups measure		
Mother's response:		0.314***	0.314***		0.253***	0.251***		0.331***	0.330***		0.242***	0.239***
Intensity as offspring		(0.038)	(0.039)		(0.049)	(0.050)		(0.037)	(0.037)		(0.054)	(0.055)
Family Fixed			0.077**			0.049			0.057			0.063
Effect			(0.037)			(0.046)			(0.037)			(0.042)
Sex	0.317	0.287	0.325	0.032	0.048	0.056	-0.077	-0.128	-0.133	0.006	-0.003	-0.002
(1=Female)	(0.294)	(0.270)	(0.270)	(0.101)	(0.095)	(0.095)	(0.291)	(0.266)	(0.266)	(0.085)	(0.082)	(0.082)
Ethnicity	0.088	0.113	0.076	-0.017	0.009	0.015	0.048	0.042	0.042	0.060	0.048	0.038
(1=White)	(0.383)	(0.353)	(0.351)	(0.125)	(0.116)	(0.115)	(0.373)	(0.338)	(0.336)	(0.106)	(0.110)	(0.109)
Emancipated	1.063**	0.847*	0.814*	0.260*	0.236*	0.234*	1.120***	0.691*	0.672	0.255*	0.181	0.188
(1=Yes)	(0.483)	(0.453)	(0.458)	(0.141)	(0.128)	(0.129)	(0.427)	(0.408)	(0.413)	(0.133)	(0.128)	(0.128)
Educational level:	0.158	0.038	0.060	-0.047	-0.121	-0.118	-0.027	-0.118	-0.079	-0.056	-0.075	-0.058
High School	(0.645)	(0.574)	(0.581)	(0.200)	(0.176)	(0.177)	(0.639)	(0.527)	(0.531)	(0.169)	(0.161)	(0.163)
Educational level:	0.288	0.184	0.158	-0.022	-0.068	-0.077	-0.003	-0.178	-0.172	-0.010	-0.022	-0.014
Vocational School	(0.705)	(0.644)	(0.652)	(0.218)	(0.197)	(0.198)	(0.702)	(0.601)	(0.605)	(0.187)	(0.181)	(0.182)
Educational level:	-0.175	-0.077	-0.070	-0.226	-0.216	-0.212	0.185	0.212	0.237	0.014	0.003	0.022
Tertiary	(0.771)	(0.706)	(0.713)	(0.226)	(0.203)	(0.205)	(0.761)	(0.649)	(0.651)	(0.204)	(0.186)	(0.187)
Employed (1=Yes)	0.077	-0.022	-0.042	0.161	0.154	0.154	-0.027	-0.212	-0.207	0.074	0.046	0.052
	(0.352)	(0.329)	(0.329)	(0.115)	(0.112)	(0.112)	(0.334)	(0.307)	(0.307)	(0.097)	(0.096)	(0.095)
Meet friend:	0.043	0.066	0.112	-0.016	-0.033	-0.025	-0.129	0.032	0.064	0.161*	0.159*	0.163*
Neighborhood	(0.342)	(0.314)	(0.316)	(0.107)	(0.102)	(0.101)	(0.332)	(0.305)	(0.304)	(0.094)	(0.089)	(0.089)
Meet friend:	0.063	0.223	0.220	-0.101	-0.123	-0.125	-0.160	0.242	0.242	0.033	0.083	0.080
Other	(0.381)	(0.363)	(0.358)	(0.126)	(0.118)	(0.118)	(0.395)	(0.372)	(0.369)	(0.112)	(0.103)	(0.102)
BFI:	-0.007	-0.011	-0.011	-0.002	-0.002	-0.002	-0.015	-0.003	-0.002	-0.005	-0.004	-0.003
Extraversion	(0.028)	(0.026)	(0.025)	(0.009)	(0.008)	(0.008)	(0.027)	(0.025)	(0.025)	(0.008)	(0.008)	(0.008)
BFI:	0.059*	0.029	0.030	0.021**	0.014	0.014	0.015	-0.004	-0.004	0.009	0.007	0.008
Agreeableness	(0.031)	(0.029)	(0.029)	(0.009)	(0.009)	(0.009)	(0.031)	(0.029)	(0.029)	(0.009)	(0.008)	(0.008)
BFI:	-0.017	-0.002	0.001	-0.010	-0.008	-0.008	0.005	0.020	0.020	-0.004	-0.001	-0.001
Conscientiousness	(0.025)	(0.023)	(0.023)	(0.008)	(0.008)	(0.008)	(0.025)	(0.023)	(0.020)	(0.007)	(0.007)	(0.007)
BFI:	0.019	0.024	0.025	0.011	0.009	0.009	0.024	0.019	0.021	-0.002	-0.002	-0.002
Neuroticism	(0.027)	(0.025)	(0.025)	(0.008)	(0.008)	(0.008)	(0.025)	(0.023)	(0.023)	(0.008)	(0.007)	(0.007)
BFI:	0.024	0.010	0.010	0.009	0.004	0.004	0.035	0.021	0.021	0.011*	0.007	0.007
Openness	(0.022)	(0.021)	(0.021)	(0.007)	(0.007)	(0.007)	(0.022)	(0.021)	(0.021)	(0.006)	(0.006)	(0.006)
Region	0.108	0.126	0.127	-0.091	-0.036	-0.031	-0.112	-0.031	-0.022	-0.030	-0.010	-0.002
(1=Montevideo)	(0.299)	(0.279)	(0.278)	(0.103)	(0.098)	(0.097)	(0.296)	(0.280)	(0.279)	(0.086)	(0.082)	(0.083)
Log of household	0.338*	0.197	0.187	0.055	0.049	0.047	0.145	-0.021	-0.034	-0.026	-0.035	-0.041
income (ten thousands)	(0.192)	(0.174)	(0.174)	(0.071)	(0.064)	(0.064)	(0.190)	(0.176)	(0.176)	(0.054)	(0.055)	(0.055)
Constant	-0.258	0.337	-0.162	-0.509	-0.266	-0.305	2.680	2.797	2.439	0.535	0.495	0.458
	(2.442)	(2.187)	(2.167)	(0.801)	(0.755)	(0.751)	(2.374)	(2.147)	(2.147)	(0.681)	(0.627)	(0.628)
Difference of means tests: Are the estimates different of intergenerational transmission?												
p-values	-.-		0.955	-.-		0.538	-.-		0.792	-.-		0.375
Observations	648	648	648	648	648	648	648	648	648	648	648	648
R^2	0.023	0.126	0.132	0.023	0.095	0.097	0.019	0.133	0.136	0.022	0.076	0.080

Notes: This table shows estimates of equation (2). In the Educational level variable, the omitted level is primary education, while in Meet friends, the omitted place is in the educational center. Dependent variable: Highest-intensity measure - largest score reported across all groups; Number-of-high-intensity-groups measure - number of reference groups for which individuals report an intensity larger than 7. *Significant at 10%, **significant at 5%, ***significant at 1%. Standard errors in parentheses

Table A3: Intergenerational transmission of Intensity measure. Estimates with individual fixed effect

	Crisis Scenario		Job Offer Scenario	
	(1)	(2)	(3)	(4)
Mother's response:				
Intensity	0.380***	0.282***	0.371***	0.196***
as the offspring	(0.024)	(0.025)	(0.022)	(0.024)
Dummy by reference group (omitted: Friends)				
Neighbors		-1.229***		-1.082***
		(0.108)		(0.101)
Family		0.420***		-0.333***
		(0.116)		(0.124)
Same profile		0.518***		1.640***
		(0.124)		(0.135)
Union		-0.451***		0.115
		(0.111)		(0.121)
Constant	2.216***	2.685***	2.167***	2.620***
	(0.079)	(0.100)	(0.066)	(0.099)
Observations	3,240	3,240	3,240	3,240
R^2	0.143	0.220	0.136	0.253

Notes: *Significant at 10%, **significant at 5%, ***significant at 1%. Standard errors in parentheses

Table A4: Intensity and Direction of income comparisons. Transmission from father to children. Crisis scenario. Estimates with family fixed effect

	Intensity		Direction				
	Highest-intensity measure	Number-of-high-intensity-groups measure	Social groups			Labor related groups	
			Friends	Neighbors	Family	Same profile	Union
Father's response:							
Intensity	0.522***	0.499***					
as the offspring	(0.108)	(0.101)					
Direction			0.156	0.418***	0.440***	0.495***	0.096
as the offspring			(0.231)	(0.107)	(0.081)	(0.127)	(0.125)
Observations	70	70	70	70	70	70	70
R^2	0.477	0.417	0.165	0.430	0.594	0.464	0.291

Notes: Estimates of the other control variables included in the regression are reported in Tables A2 and A5 in the Annex. Dependent variables: (i) Intensity - Highest-intensity measure (largest score reported across all groups), and Number-of-high-intensity-groups measure (number of reference groups for which individuals report an intensity larger than 7); (ii) Direction - Standardized individual scores. *Significant at 10%, **significant at 5%, ***significant at 1%. Standard errors in parentheses

Table A5: Intergenerational transmission of direction of income comparisons. Full estimation. Crisis scenario

	Friends		Neighbors		Family		Same profile		Union	
Mother's response: Direction	0.149***	0.149***	0.327***	0.323***	0.398***	0.396***	0.200***	0.197***	0.211***	0.212***
as the offspring	(0.049)	(0.049)	(0.049)	(0.049)	(0.041)	(0.041)	(0.041)	(0.041)	(0.043)	(0.043)
Family Fixed		-0.007		0.075**		0.024		0.036		-0.017
Effects		(0.039)		(0.036)		(0.035)		(0.039)		(0.036)
Sex (1=Female)	-0.205	-0.204	0.009	0.001	0.426**	0.425**	-0.175	-0.169	-0.118	-0.118
	(0.144)	(0.144)	(0.142)	(0.142)	(0.167)	(0.167)	(0.183)	(0.181)	(0.156)	(0.156)
Ethnicity	-0.292	-0.292	0.077	0.088	-0.114	-0.121	0.275	0.275	0.058	0.056
(1=White)	(0.202)	(0.202)	(0.200)	(0.199)	(0.208)	(0.208)	(0.201)	(0.201)	(0.195)	(0.196)
Emancipated	-0.227	-0.226	-0.561***	-0.542***	0.565*	0.571*	0.391	0.382	-0.139	-0.136
(1=Yes)	(0.235)	(0.235)	(0.207)	(0.207)	(0.296)	(0.296)	(0.336)	(0.337)	(0.266)	(0.267)
Education Level: High School	0.369	0.373	-0.202	-0.202	0.248	0.260	-0.221	-0.216	-0.090	-0.086
	(0.275)	(0.276)	(0.263)	(0.267)	(0.312)	(0.312)	(0.355)	(0.359)	(0.339)	(0.338)
Education Level:	0.549*	0.552*	-0.291	-0.293	0.133	0.137	-0.185	-0.165	-0.177	-0.173
Vocational School	(0.303)	(0.304)	(0.295)	(0.299)	(0.355)	(0.354)	(0.404)	(0.408)	(0.366)	(0.365)
Education Level: Tertiary	0.146	0.148	0.019	0.011	-0.007	-0.003	0.019	0.028	-0.148	-0.148
	(0.331)	(0.332)	(0.319)	(0.315)	(0.379)	(0.378)	(0.470)	(0.473)	(0.381)	(0.381)
Employed (1=Yes)	0.225	0.223	-0.032	-0.044	-0.391**	-0.392**	0.222	0.225	-0.098	-0.097
	(0.161)	(0.162)	(0.168)	(0.167)	(0.196)	(0.196)	(0.203)	(0.203)	(0.183)	(0.183)
Meet friend: Neighborhood	-0.024	-0.026	0.181	0.154	0.111	0.108	-0.239	-0.238	-0.041	-0.046
	(0.164)	(0.165)	(0.156)	(0.155)	(0.183)	(0.183)	(0.197)	(0.196)	(0.165)	(0.166)
Meet friend: Other	-0.019	-0.020	-0.093	-0.109	-0.140	-0.137	0.155	0.142	0.043	0.038
	(0.176)	(0.176)	(0.189)	(0.188)	(0.220)	(0.220)	(0.243)	(0.243)	(0.180)	(0.181)
BFI: Extraversion	-0.006	-0.006	0.007	0.009	0.016	0.016	-0.011	-0.012	-0.0002	-0.0005
	(0.013)	(0.013)	(0.013)	(0.013)	(0.015)	(0.015)	(0.016)	(0.016)	(0.014)	(0.014)
BFI: Agreeableness	0.001	0.001	-0.026*	-0.027*	0.076***	0.076***	-0.055***	-0.054***	-0.008	-0.008
	(0.016)	(0.016)	(0.014)	(0.014)	(0.017)	(0.017)	(0.018)	(0.018)	(0.016)	(0.016)
BFI: Conscientiousness	-0.021*	-0.021*	0.022*	0.023*	-0.038***	-0.038***	0.050***	-0.050***	-0.003	-0.003
	(0.012)	(0.012)	(0.013)	(0.013)	(0.014)	(0.014)	(0.016)	(0.016)	(0.013)	(0.013)
BFI: Neuroticism	-0.015	-0.014	0.002	0.002	0.006	0.006	-0.004	-0.004	0.016	0.017
	(0.013)	(0.013)	(0.012)	(0.012)	(0.015)	(0.015)	(0.015)	(0.015)	(0.014)	(0.014)
BFI: Openness	0.002	0.002	0.001	0.001	0.011	0.012	-0.018	-0.018	0.004	0.004
	(0.010)	(0.010)	(0.011)	(0.011)	(0.013)	(0.013)	(0.014)	(0.014)	(0.012)	(0.012)
Region	-0.173	-0.173	-0.114	-0.100	-0.043	-0.044	-0.035	-0.032	0.413**	0.416***
(1=Montevideo)	(0.149)	(0.149)	(0.150)	(0.149)	(0.179)	(0.179)	(0.176)	(0.176)	(0.163)	(0.162)
Log of household	0.131	0.131	-0.194*	-0.191*	0.073	0.073	0.001	0.004	-0.024	-0.022
income (ten thousands)	(0.091)	(0.091)	(0.103)	(0.102)	(0.107)	(0.107)	(0.112)	(0.112)	(0.097)	(0.097)
Constant	0.076	0.074	0.783	2.808	-2.763**	-2.788**	2.114	2.061	-0.257	-0.288
	(1.045)	(1.046)	(1.116)	(1.158)	(1.250)	(1.250)	(1.333)	(1.336)	(1.106)	(1.106)
Difference of means tests: Are the estimates different of intergenerational transmission?										
p-values	0.940		0.307		0.547		0.388		0.699	
Observations	648	648	648	648	648	648	648	648	648	648
R^2	0.053	0.053	0.127	0.132	0.242	0.243	0.090	0.091	0.082	0.082

Notes: In the Educational level variable, the omitted level is primary education, while in Meet friends, the omitted place is in the educational center. *Significant at 10%, **significant at 5%, ***significant at 1%. Standard errors in parentheses.

Table A6: Intergenerational transmission of direction of income comparisons. Full estimation. Job Offer scenario

	Friends		Neighbors		Family		Same profile		Union	
Mother's response: Direction	0.110**	0.110**	0.214***	0.214***	0.108***	0.105**	0.271***	0.273***	0.181***	0.182***
as the offspring	(0.045)	(0.045)	(0.048)	(0.048)	(0.045)	(0.045)	(0.041)	(0.040)	(0.043)	(0.043)
Family Fixed		-0.029		0.006		0.047		0.046		0.033
Effects		(0.039)		(0.042)		(0.044)		(0.037)		(0.039)
Sex (1=Female)	-0.083	-0.083	0.096	0.097	0.233	0.230	-0.256	-0.262	0.001	0.002
	(0.155)	(0.156)	(0.129)	(0.129)	(0.172)	(0.172)	(0.190)	(0.190)	(0.171)	(0.171)
Ethnicity	-0.323	-0.331	0.261	0.260	-0.143	-0.161	0.206	0.195	-0.054	-0.040
(1=White)	(0.205)	(0.205)	(0.184)	(0.261)	(0.222)	(0.223)	(0.229)	(0.228)	(0.209)	(0.210)
Emancipated	-0.562**	-0.562**	-0.399*	-0.399*	0.954***	0.966***	0.049	0.041	-0.107	-0.110
(1=Yes)	(0.272)	(0.272)	(0.210)	(0.211)	(0.336)	(0.335)	(0.331)	(0.333)	(0.320)	(0.319)
Education Level: High School	-0.279	-0.270	-0.274	-0.277	-0.573**	-0.580**	0.252	0.280	0.919***	0.929***
	(0.329)	(0.331)	(0.255)	(0.257)	(0.279)	(0.280)	(0.402)	(0.407)	(0.338)	(0.339)
Education Level: Vocational School	0.076	0.088	-0.254	-0.255	-0.405	-0.410	-0.061	-0.031	0.627*	0.633*
	(0.359)	(0.362)	(0.297)	(0.299)	(0.336)	(0.335)	(0.444)	(0.448)	(0.369)	(0.369)
Education Level: Tertiary	-0.173	-0.169	-0.305	-0.308	-0.525	-0.532	0.013	0.002	1.053**	1.066**
	(0.390)	(0.391)	(0.306)	(0.307)	(0.366)	(0.366)	(0.503)	(0.506)	(0.420)	(0.421)
Employed (1=Yes)	-0.042	-0.045	0.068	0.067	0.314	0.315*	-0.625***	-0.613***	0.278	0.273
	(0.158)	(0.159)	(0.160)	(0.161)	(0.191)	(0.190)	(0.223)	(0.223)	(0.206)	(0.205)
Meet friend: Neighborhood	-0.043	-0.046	0.124	0.123	0.098	0.102	-0.167	-0.165	0.012	0.009
	(0.165)	(0.165)	(0.147)	(0.148)	(0.184)	(0.183)	(0.215)	(0.214)	(0.186)	(0.185)
Meet friend: Other	-0.056	-0.056	-0.014	-0.015	0.371	0.366	-0.302	-0.292	0.035	0.040
	(0.185)	(0.184)	(0.163)	(0.163)	(0.234)	(0.233)	(0.265)	(0.265)	(0.228)	(0.228)
BFI: Extraversion	-0.023*	-0.023*	-0.001	-0.002	0.016	0.017	0.002	0.001	0.006	0.006
	(0.014)	(0.014)	(0.012)	(0.012)	(0.015)	(0.015)	(0.017)	(0.017)	(0.015)	(0.015)
BFI: Agreeableness	-0.004	-0.003	-0.014	-0.014	0.070***	0.071***	-0.037*	-0.037*	-0.018	-0.018
	(0.015)	(0.015)	(0.013)	(0.013)	(0.018)	(0.018)	(0.020)	(0.020)	(0.017)	(0.017)
BFI: Conscientiousness	0.001	0.001	0.001	-0.063***	-0.036**	-0.036**	0.038**	0.037**	-0.003	-0.003
	(0.014)	(0.014)	(0.012)	(0.016)	(0.014)	(0.014)	(0.016)	(0.016)	(0.015)	(0.015)
BFI: Neuroticism	-0.020	-0.020	-0.004	-0.004	-0.003	-0.002	0.005	0.006	0.022	0.021
	(0.013)	(0.013)	(0.011)	(0.011)	(0.015)	(0.015)	(0.017)	(0.017)	(0.015)	(0.015)
BFI: Openness	-0.014	-0.014	0.005	0.005	0.019	0.019	-0.024	-0.023	0.013	0.012
	(0.011)	(0.011)	(0.010)	(0.010)	(0.013)	(0.013)	(0.015)	(0.015)	(0.013)	(0.013)
Region	0.077	0.076	0.063	0.063	0.191	0.188	-0.463**	-0.464**	0.127	0.124
(1=Montevideo)	(0.147)	(0.147)	(0.133)	(0.133)	(0.173)	(0.172)	(0.192)	(0.192)	(0.171)	(0.171)
Log of household	0.043	0.043	-0.182**	-0.181**	-0.044	-0.042	0.266**	0.266**	-0.102	-1.107
income (ten thousands)	(0.098)	(0.099)	(0.083)	(0.083)	(0.114)	(0.113)	(0.117)	(0.117)	(0.109)	(0.110)
Constant	1.776*	1.743	0.799	0.804	-2.253*	-2.294*	0.151	0.093	-0.342	-0.337
	(1.051)	(1.065)	(0.967)	(0.971)	(1.311)	(1.300)	(1.446)	(1.448)	(1.286)	(0.286)
Observations	648	648	648	648	648	648	648	648	648	648
R^2	0.049	0.050	0.079	0.079	0.077	0.079	0.119	0.121	0.066	0.068

Notes: In the Educational level variable, the omitted level is primary education, while in Meet friends, the omitted place is in the educational center. *Significant at 10%, **significant at 5%, ***significant at 1%. Standard errors in parentheses.

Table A7: Intergenerational transmission of intensity of income comparisons by mother's employment status. Estimates with family fixed effect

	Crisis Scenario				Job Offer Scenario			
	Highest-intensity measure		Number-of-high-intensity-groups measure		Highest-intensity measure		Number-of-high-intensity-groups measure	
Mother's response:								
Intensity	0.367***	0.288***	0.252***	0.233***	0.449***	0.278***	0.284***	0.217***
as the offspring	(0.067)	(0.045)	(0.081)	(0.060)	(0.064)	(0.044)	(0.099)	(0.064)
	Difference of means tests: Are the estimates different?							
p-values	0.330		0.847		0.027		0.575	
Observations	178	470	178	470	178	470	178	470
R^2	0.244	0.123	0.247	0.097	0.296	0.098	0.194	0.065
Dependent variable:								
Mean	5.270	5.628	0.843	0.834	5.236	5.683	0.685	0.753
SD	3.700	3.718	1.248	1.180	3.739	3.661	1.053	0.985
Employed mother	No	Yes	No	Yes	No	Yes	No	Yes

Notes: Estimates of the other control variables included in the regression are reported in Table A2 in the Annex. Dependent variable: Highest-intensity measure - largest score reported across all groups; Number-of-high-intensity-groups measure - number of reference groups for which individuals report an intensity larger than 7. *Significant at 10%, **significant at 5%, ***significant at 1%. Standard errors in parentheses.

Table A8: Intergenerational transmission of direction of income comparisons by mother's employment status. Estimates with family fixed effect

	Social groups						Labor-related groups			
	Friends		Neighbors		Family		Same profile		Union	
Panel (a) Mother's response - Crisis Scenario:										
Direction as	-0.045	0.210***	0.278***	0.335***	0.349***	0.406***	0.176**	0.199***	0.173**	0.222***
the offspring	(0.092)	(0.058)	(0.101)	(0.057)	(0.080)	(0.047)	(0.085)	(0.047)	(0.083)	(0.051)
	Difference of means tests: Are the estimates different?									
p-values	0.019		0.623		0.541		0.809		0.621	
Observations	178	470	178	470	178	470	178	470	178	470
R^2	0.103	0.069	0.179	0.138	0.256	0.251	0.148	0.093	0.083	0.097
Dependent variable:										
Mean	-0.129	0.152	-1.202	-1.508	0.607	0.728	0.904	1.003	-0.180	-0.376
SD	1.624	1.758	1.634	1.873	2.136	2.391	2.267	2.212	1.844	1.964
Panel (b) Mother's response - Jobb Offer:										
Direction as	-0.031	0.169***	0.202**	0.233***	0.180**	0.086	0.331***	0.243***	0.132	0.195***
the offspring	(0.073)	(0.054)	(0.095)	(0.052)	(0.086)	(0.053)	(0.083)	(0.046)	(0.097)	(0.048)
	Difference of means tests: Are the estimates different?									
p-values	0.028		0.774		0.347		0.359		0.566	
Observations	178	470	178	470	178	470	178	470	178	470
R^2	0.167	0.068	0.110	0.102	0.209	0.059	0.216	0.111	0.115	0.077
Dependent variable:										
Mean	-0.211	-0.073	-1.234	-1.467	-0.491	-0.543	1.699	2.022	0.165	0.061
SD	1.635	1.759	1.681	1.609	2.059	2.150	2.481	2.448	2.043	2.102
Employed mother	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes

Notes: This table shows estimates of equation (5). Estimates of the control variables included in the regression are reported in Table A5 in the Annex. Dependent variable: Standardized individual scores. *Significant at 10%, **significant at 5%, ***significant at 1%. Standard errors in parentheses.

Figure A1: Comparison of results of the intensity and direction of interpersonal comparisons in ELBU (children and mothers) with results in Clark and Senik (2010)

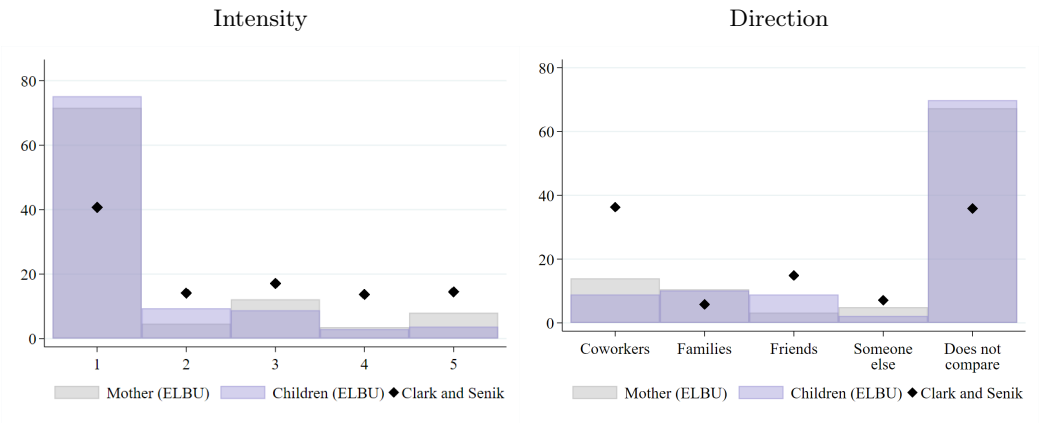

Figure A2: Comparison of intensity of interpersonal comparisons in Job Offer and Economic Crisis questions with results from Clark and Senik (2010)

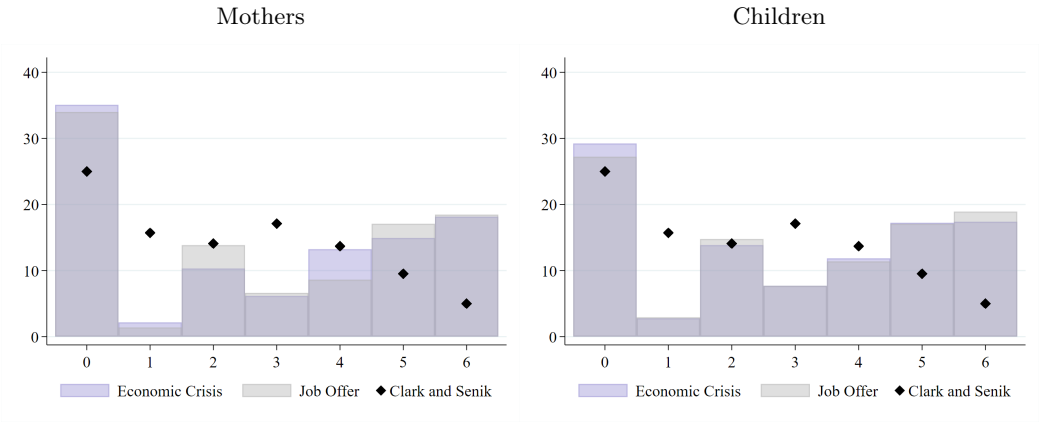

Table A9: Intensity of income comparisons. Instrumental variables. First stage. Crisis Scenario

	Highest-intensity measure	Number-of-high-intensity-groups measure
Family Fixed Effect	-0.005	0.002
	(0.033)	(0.045)
Sex (1=Female)	-0.002	-0.086
	(0.239)	(0.087)
Racial ancestry	0.088	-0.053
(1=White)	(0.303)	(0.125)
Emancipated (1=Yes)	-0.100	-0.076
	(0.420)	(0.149)
Employed (1=Yes)	-0.021	0.010
	(0.274)	(0.116)
Region (1=Montevideo)	0.091	-0.145
	(0.255)	(0.091)
Log of household income	0.144	0.004
(ten thousands)	(0.155)	(0.057)
Education Level (omitted: primary)		
High School	0.214	0.259
	(0.435)	(0.158)
Vocational School	0.013	0.225
	(0.489)	(0.194)
Tertiary	-0.263	-0.024
	(0.552)	(0.186)
Meet friend (omitted: education)		
Neighborhood	0.219	0.086
	(0.273)	(0.099)
Other	0.229	0.205
	(0.350)	(0.144)
Big Five Inventory		
Extraversion	0.035	0.002
	(0.024)	(0.009)
Agreeableness	0.059**	0.020*
	(0.024)	(0.012)
Conscientiousness	-0.021	-0.003
	(0.020)	(0.008)
Neuroticism	-0.025	0.004
	(0.022)	(0.008)
Openness	0.019	0.014**
	(0.018)	(0.007)
Instrument:		
Intensity: Job Offer	0.607***	0.566***
Scenario	(0.034)	(0.066)
Constant	-1.732	-0.959
	(1.964)	(0.685)
Observations	648	648
R^2	0.389	0.225

Notes: *Significant at 10%, **significant at 5%, ***significant at 1%. Standard errors in parentheses.

Table A10: Direction of income comparisons. Instrumental variables. First stage. Crisis Scenario

	Friends	Neighbors	Family	Same profile	Union
Familiy Fixed Effects	0.007	0.046	0.066*	0.111***	0.053
	(0.035)	(0.031)	(0.039)	(0.039)	(0.041)
Sex (1=Female)	0.127	0.002	0.364*	-0.165	-0.307**
	(0.141)	(0.115)	(0.197)	(0.173)	(0.144)
Racial ancestry	-0.268	0.217	-0.370	0.072	0.237
(1=White)	(0.190)	(0.166)	(0.233)	(0.169)	(0.160)
Emancipated (1=Yes)	-0.052	-0.039	-0.029	0.093	-0.045
	(0.198)	(0.187)	(0.303)	(0.274)	(0.216)
Employed (1=Yes)	-0.001	0.038	0.256	-0.189	-0.128
	(0.147)	(0.131)	(0.218)	(0.199)	(0.167)
Region (1=Montevideo)	-0.077	-0.078	-0.130	0.252	0.057
	(0.141)	(0.122)	(0.194)	(0.167)	(0.145)
Log of household income	0.172*	-0.052	0.169	0.014	0.032
(ten thousands)	(0.094)	(0.070)	(0.124)	(0.121)	(0.090)
Education Level (omitted: primary)					
High School	0.087	-0.144	-0.282	0.204	0.250
	(0.279)	(0.204)	(0.364)	(0.331)	(0.275)
Vocational School	0.076	-0.044	0.012	-0.024	0.005
	(0.297)	(0.240)	(0.391)	(0.375)	(0.295)
Tertiary	0.249	-0.044	0.032	0.117	-0.198
	(0.340)	(0.243)	(0.430)	(0.422)	(0.311)
Meet friend (omitted: education)					
Neighborhood	0.192	-0.078	0.099	-0.120	-0.077
	(0.150)	(0.133)	(0.214)	(0.190)	(0.150)
Other	0.058	0.077	0.248	-0.221	-0.128
	(0.160)	(0.146)	(0.232)	(0.221)	(0.170)
Big Five Inventory					
Extraversion	0.009	-0.025**	-0.014	0.041***	-0.012
	(0.012)	(0.011)	(0.017)	(0.015)	(0.012)
Agreeableness	-0.003	-0.015	0.071***	-0.006	-0.049***
	(0.015)	(0.011)	(0.019)	(0.016)	(0.014)
Conscientiousness	0.012	0.012	-0.054***	0.017	0.013
	(0.012)	(0.009)	(0.018)	(0.015)	(0.011)
Neuroticism	0.003	0.011	-0.036**	0.008	0.011
	(0.012)	(0.011)	(0.018)	(0.015)	(0.013)
Openness	0.002	0.000	0.006	-0.018	0.009
	(0.012)	(0.008)	(0.015)	(0.013)	(0.011)
Instrument:					
Intensity: Job Offer	0.201***	0.552***	0.403***	0.475***	0.455***
Scenario	(0.047)	(0.043)	(0.053)	(0.040)	(0.041)
Constant	0.618	0.562	-0.421	-1.109	0.516
	(1.099)	(0.884)	(1.413)	(1.403)	(1.065)
Observations	648	648	648	648	648
R^2	0.075	0.343	0.166	0.293	0.316

Notes: *Significant at 10%, **significant at 5%, ***significant at 1%. Standard errors in parentheses.