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Learning about one's relative position and subjective well-being

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Resumen

El trabajo muestra evidencia empírica que sugiere que los cambios en la posición relativa de los individuos en términos de ingreso afecta los niveles de bienestar subjetivo o felicidad. En este sentido, los hallazgos están en línea con los que argumentan que la función de felicidad debería tener en cuenta tanto la posición absoluta como la posición relativa. Los resultados están basados en un diseño experimental que permite discutir si el conocimiento acerca de la posición relativa afecta los niveles subjetivos de bienestar o felicidad. Por otra parte, utilizando datos no experimentales se encuentra una asociación significativa entre el bienestar subjetivo y los salarios relativos.

Abstract

In this paper we show evidence which suggests that changes in an individual's relative position affects his subjective well-being. In this sense, our findings are in line with those who argue that a felicity function should take into account both, absolute and relative position. Our result are based on a simple experimental design to discuss whether learning about one's relative position affects subjective well-being. Additionally, using non-experimental data we find a significant association between subjective well-being and relative wage.

Keywords: relative income, subjective well-being.
JEL Codes: C91, I31

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INTRODUCTION

A standard assumption in traditional consumer economic theory is that preferences are independent of cultural conventions or social contexts. A consumer is rational if he is consistent with certain choice axioms and scarcity restrictions that involve only his absolute level of consumption and income. In other terms, a consumer chooses his level of consumption in order to maximize his felicity function independently of what other people do, think or believe (Frank, 1985).

Nevertheless, there is abundant evidence that shows consumer's behavior could depend on how the "others" behave, believe, perceive or consume. Cohen (1969) describes the behavior of wealthy Sabo housewives, in Nigeria, who "sink all their profits in acquiring ever increasing numbers of Czechoslovak-made bowls...these bowls have become the most important status symbol and women are ranked according to the number of bowls they posses" (see Douglas and Isherwood, 1979). Bourdieu (1984) showed that members of the French middle-class tried to emulate upper-class attitudes and life-style, because having "good taste" was assimilated to an understanding and conformance to upper-class values. Neumark and Postlewaite (1998) find that women work more if their sister's husband earns more than their own husband. In the days of Adam Smith, an English would be ashamed to appear in public without wearing items such as leather shoes and linen shirts, because he would be supposed to be a poor (see Brekke and Howarth, 2003).

On the other hand, if consumers derive felicity from their own level of consumption, having more should be synonymous of more happiness. However, Easterlin (1974) observed that the significant increase in income in the industrial democracies over the last century was not accompanied by similar increases in happiness. An individual's subjective well-being could even fall if the increasing trend in his absolute level of consumption or income goes below that of their families, friends, neighbors or colleagues. In other terms, people care about their relative position, which affects their level of subjective well-being (Duesemberry, 1949; Frank 1985, 1991). Akerlof and Kranton (2000) consider that individual's utility depends on identity elements and not only on absolute consumption. In sum, these evidence suggest that

the traditional consumer's utility function used in economic analysis should be transformed to include concern for the relative position of the individual.

Recently, a number of empirical papers have been testing whether individuals derive utility only from their absolute level consumption or if it is also affected by the level of consumption relative to others. Among other things, asserting whether a person's relative position affects utility has important implications in theoretical modeling or on the assessment of different economic policies, such as tax or poverty reduction policies (Brekke and Howarth, 2003; Dupor and Liu, 2003, among others).

In order to test whether relative position affects subjective well-being two basic approaches have been followed. One is based on experimental studies in which subjects were asked to evaluate trade-off between absolute and relative consumption. Usually respondents are asked to choose between two states of the world: State A: Your current yearly income is \$50.000"; others earns \$25.000; State B: same but \$100.000 and \$200.000. In other terms, whether it is better to be a rich but relatively poor person in a rich society or a poor but relatively rich in a poor society. Standard economic models suggest that people should be concerned with only their own material standard of living, not with their relative standing in society. If relative standing matters then respondents will choose the world where they are relatively better (Solnik and Hemenway, 1998; Alpizar et al. 2004). The second approach, based on non-experimental data, tries to test whether the individual's relative position affects subjective well-being. Generally, the comparison income needs to be estimated and is then plugged-in as an independent right-hand side variable in the subjective well-being equation. The sign and significance of the coefficient of this variable is used an indicator about whether relative position matters. In general, these papers conclude that individual's derive utility from their absolute and relative consumptions (McBride, 2001; Clark and Oswald, 1986; Stutzer 2004, among others).

Most of these empirical papers are characterized by two basic assumptions. First, individuals are aware of their position in the income distribution, i.e. respondents know their income as well as the income of their reference group. Second, individual's comparison relative income can be determined by a set of demographic variables, i.e. it is predicted based

on a set of characteristics, and hence it is assumed that the dimension in which individual's compare themselves is known (Stutzer, 2004; Herne and Suojanen, 2004;).

In this paper we basically follow Stutzer (2004) on the need of more empirical evidence to test the relative income hypothesis. Our main concern is to contribute in three ways to these literature. In the first place, we construct an simple experimental design under the assumption that there is a learning process about one's relative position, i.e. we are originally unaware of our position with respect to our peers. Following Carlsson et al., 2003; Johannesson and Gerdtham, 1995, we assume the existence of an initial "veil of ignorance" state. Hence, our initial subjective well-being is solely determined by our absolute income level, before knowing the income of the reference group. As new information arrives, we learn the income of our reference group and hence, our relative income. If subjective well-being depends of relative income, the original SWB should change once we learn our position in the income distribution. In other terms, we assume that individual's decide their original level of happiness under a certain "veil of ignorance" with respect to what their actual relative position is. Afterwards, in process of learning, individuals gather information about what they relative position actually is. If relative position affects subjective well-being then their level of happiness should change with respect to its original "veil of ignorance" level. From this experimental design we find that learning about our relative position significantly changes the subjective well-being with respect to the uninformed or original level.

Second, we use survey non-experimental data that has information on the individual's subjective perception of his relative income position to test its effect on SWB. As Stutzer (2004) argues, a possible problem with the existing empirical literature is that it is not clear whether the estimated comparison income really measures the relative position of an individual with respect to his reference group, i.e. it is not clear "in what dimensions people compare themselves". The data we use partially resolves this problem because the survey respondents need to answer a question about their relative position in the income dimension. That is, whether their wages is above, below or at the same level to what the market is paying for people working in his same occupation and same schooling level. Using this information we find that changes in subjective well-being is statistically associated

with relative income perceptions. In particular, those who perceive that their wages are above what the market is paying are significantly happier than those who do not know their relative position; or those who know that their wages are below what the market is paying are significantly unhappier than those who do not know their relative position. As we discuss latter, we interpret these results as suggesting that learning about one's relative position affects subjective well-being.

Finally, a minor novelty of this paper is to supply evidence to this literature from Spain. Up to our knowledge there are practically no empirical papers dealing with testing the hypothesis that relative-income does matter in individual assessments of subjective well-being for Spanish people. Ahn and Garcia (2004) study the determinants of life satisfaction of comparing different countries of the European community, but do not focus on the relative income hypothesis.

The paper is organized in four sections. In the following section we briefly discuss the reasoning behind the empirical approach. In section three we present the experiment design and its results. In section four we discuss the data and descriptive results. In the last section we conclude.

SWB AND RELATIVE POSITION

Recently, in a Spanish newspaper gossip column, a journalist invited to the wedding of prince Felipe in Spain narrated her feelings when she found that another women in the wedding was using the same dress. As she explains, before the wedding she was really happy with her new and original dress. But that level of happiness disappeared once she learned that another women in the wedding was dressing the same clothes. In other terms, learning about her relative position affected her original subjective well-being.

Following the last paragraph, a possible way to study whether SWB is affected by one's relative position is to compare the reported subjective well-being of an individual when she is unaware of her position in the wage distribution, i.e. a "veil of ignorance" state, with the reported SWB after learning about her the relative position. Stated differently, we could be

interested in calculating how the SWB distribution -or some moment of this distribution- changes when she learns about her relative position,

$$\triangle(s) = F(s|RP_i, X_i) - F(s|VI_i, X_i)$$

or

$$\triangle(S) = E(S|RP_i, X_i) - E(S|VI_i, X_i)$$

where $F(\cdot)$ is the cumulative distribution function of reported SWB conditional on individual i knowing his relative position, RP_i, and on some characteristics, X_i, and where VI_i means refers to the "veil of ignorance" state. Additionally, E refers to the conditional expectation. If positional concerns are taken into account by individuals, $\triangle(s)$ should be different from zero.

In order to study whether $\triangle(s)$ is different for zero we follow two approaches. First, using college students we develop an experiment where students have to report their SWB, in the wage dimensions, under the "veil of ignorance" and after learning about their relative position. Second, using non experimental data we analyze the association between SWB and different type of information about one's relative wage position. In both cases we find that there is an important association between changes in SWB and learning's one's relative position.

EXPERIMENT DESIGN AND RESULTS

The experiment was conducted at the University of Vigo, Spain, between September and November 2004[1]. A total of 283 students were interviewed in the classroom as part of a lecture with an average size class of 15-60 students. The survey lasted approximately 30 minutes and there was no show-up fee paid. In addition to the printed information, the respondents were given verbal information before the beginning of the experiment.

The basic idea of the experiment can be resume in the following example. Imagine that two university colleagues, Smith and Jones, are new entrants in the labor market. Smith

[1]A similar experiment was conducted in Uruguay obtaining the same conclusions. Due to space reasons, we only include one of the experiments.

finds a job first, and he is particularly happy of the wage offered, i.e. the absolute wage is larger than his reservation utility level. However, if relative position matters, Smith's happiness level will presumably fall when he learns that Jones accepted a job with similar characteristics but a higher wage. In other terms, initially Smith is unaware of his income position relative to Jones' wage -his reference group-, so Smith's absolute wage determines his original level of SWB. If relative position matters, when Smith learns that his wage is below that of Jones, his SWB should fall.

The questionnaire of the experiment was divided in two parts. In the first part, the respondent was given a wage offer for the job they were looking for. Once observing this wage, she should rank between 1, totally unsatisfied, and 10, totally satisfied, the satisfaction level obtained from that wage. In the second part, we gave the respondent information about the minimum wage offered to her classmates that opted to and where accepted for a similar job. Therefore, in this second part a respondent could learn about whether her wage was above or below the one offered to the "reference group". Again, the respondent should then rank between 1, totally unsatisfied, and 10, totally satisfied, their satisfaction level after observing what their colleagues earns and express, in words, what had made him to decide that particular level of happiness.

There were four different scenarios: (1) The respondents wage in the first part: 1200 euros; minimum classmates in the second part: 1800 euros; (2) the respondents wage 1200 euros and classmates 600; (3) the respondents wage of 600 euros and classmates 300 euros; (4) the respondents 600 euros and classmates 900 euros. The wages proposed were similar to what is expected for these students to earn in the market: 600 euros is the more or less wage for a bachelor student in his first job, while 1200 euros is something less than the mean income of the Spanish wage distribution (González et al. 2000).

Each of these scenarios was presented to a different class. The idea of not repeating the experiment in the same class was to prevent of strategic behavior. Additionally, the intention of including two different wages, such as 1200 and 600 euros, was to determine whether the original level of satisfaction is affected by the absolute wage level. Naturally, once the respondent was given information about the wage of his colleagues, he learned his

relative income position.

In order to recover information about the level of unawareness the students have with respect to the true wage distribution in the economy we asked students to report the minimum wage and the mean wage. For this, we gave them different wage intervals so they could approximate their answer. Only 31% of the students answered correctly the wage interval containing the minimum wage. In terms of values, the legal minimum wage is of 490 euros while the mean students response was of 533 euros, nearly a 10% more, which resulted to an statistically significant difference. In what respects to the mean wage, only 11% of the students answered in the correct wage interval. While the mean wage is approximately 1400 euros/month, the students mean answer was of 983 euros, which was statistically different from the true mean wage. The striking fact was that during the year 2004 there was an important debate in the Spanish media and political spheres about the minimum wage and mean wage, i.e. in the line of what should the minimum wage level be and about the mean wage, or the relationship between the Spanish mean wage and the price of a new house. In other terms, students seemed to be unaware of the true wage distribution despite the continuous reference of it in the Spanish media.

In Table 1 we present the basic results of the four scenarios. Each row represents the situation presented to different students in different classes. In the first two columns we show the mean satisfaction level declared before and after information of relative position was given, in column 3 to 6 we present the percentage of respondents where satisfaction fell, remain constant, or increase with respect to the original level when information of the relative position was given.

Insert Table 1

Overall, the reported level of satisfaction changes when respondents learn about their relative position. In other terms, relative position seems to affect subjective well-being and being the change in SWB more significant when we find that our income is below that of our colleagues.

Observe that there is a positive correlation between the SWB declared and the wage

level in the "veil of ignorance" state, i.e. the absolute wage determines the initial level of satisfaction. An original wage of 1200 euros is associated with a mean level of satisfaction of about 7.5 while 600 euros is about 4.

Declared initial satisfaction changes when the respondent learns that the wage he will receive is below that of his colleagues, i.e. the mean satisfaction level significantly falls. In other terms, learning that we are at the tail of the wage distribution significantly affects the original "veil of ignorance" SWB. On the other hand, when the respondent learns that his wage is above that of his colleagues, the mean does not significantly change but the distribution does change, i.e. more than one half of the respondents increase their declared level of satisfaction. That is, respondents are happier when they learn their wage is on the upper tail of the wage distribution. In sum, the satisfaction is affected by both, the absolute wage level and the relative position on the wage distribution.

A possible flaw of the above findings could be due to an order effect, i.e. the second decision is conditional to the first one. Therefore, for two different classes of students we reversed the questions: first, we asked the respondent about their level of SWB if the respondent learns that the minimum wage earned by her friends is 1200 euros (alternatively, 600 euros); subsequently, we asked the respondent his level of SWB if he now learns that his wage is 600 euros (alternatively 1200 euros). The mean level of SWB when a respondent first finds that his friends earn 1200 euros was of 6.97 and when she learned that he earned 600 euros the mean declared SWB fell to 2.71. In the case where her friends earn 600 euros, the mean his SWB was of 4.10 and when he learn that he was earning 1200 euros, his SWB was of 8.36. These findings suggests that the qualitative results obtained for the experiments seem to be robust to changes in the ordering of the questions.

The above results could suggest what Frank (1985) states, that a job could even be accepted at lower wage if income is proportionally higher than her immediate coworkers, i.e. "local status", nobody wants to be in the tail (see also the results using non experimental data in Groot and van den Brink, 1999).

In the following section we use survey data to discuss whether knowing the relative position in the wage dimension, i.e. being aware of the position in the wage distribution,

affects subjective well-being of Spanish employees.

LEARNING ONE'S RELATIVE POSITION AND SWB

The data used to carry out the empirical analysis were obtained from the Encuesta de Calidad de Vida en el Trabajo - ECVT (Survey of the Quality of Life at Work). The main target of this survey is to gather information about the workers' labor situation and their attitudes and values with respect to the work they do. The population range is limited to employed persons of 16 and over who live in family homes. The information was gathered in personal interviews conducted at the homes of the employed people selected. The total pooled sample for the years 2001 to 2003 sums up to 18038 observations.

Generally, surveys do not report information of the individual's perception of his relative position in the wage dimension. This fact explains why some papers dealing with relative issues need to predict the individuals' comparison income based on demographic variables. The survey we use has the novelty of reporting the respondent subjective perception of his relative income position in the wage dimension. That is, respondents were asked: "Upto your knowledge and for the type of job you perform, compare your salary to that of the market for the same position. Is it above, below, is correct one or you do not now?". We will use this information in order to discuss the association between SWB and the relative wage position assuming that the individual reference group are those in the same occupation (see below the sample selection approach).

Additionally, following the ideas behind some previous empirical papers, which suggest the importance of homogeneity in the data to be used (Frey and Stutzer, 2002; among others), we have selected a subsample of based on the following criteria . First, we had selected a subsample of relatively satisfied individuals with their job, leisure and household economic situation. That is, for questions "All things considered, how satisfied or dissatisfied are you with your present job", "...your leisure", "...your household economic situation" which where scaled from 1, completely unsatisfied, to 10, completely satisfied, we only considered those who answered five or more. Selectivity bias of satisfaction surveys may be

mitigated if we use only satisfied workers, i.e. dissatisfied workers are probably underreport due to the fact that they are more prone to leave employment. Also, this diminishes the possibility of response bias, i.e. dissatisfied workers could tend to negatively respond to the survey. Second, we only selected those workers who responded that their jobs match to their educational background, i.e. respondent work in jobs that were accordance to their education level. Third, we had selected workers which work in the public sector under the believe that their activities are more homogeneous. Finally, we had selected an age range between 18 and 65 years old. The final number of observations of this subsample is of 1920.

The measure for individual's subjective well-being is based on the answers to the following question "Taken all together, are you satisfied with your actual life?" The respondent should answer through a scale that goes from 1 -completely dissatisfied- to 10 -completely satisfied. Here we assume as valid the conclusions of the methodological literature that discusses the reliability, validity and comparability of self reported data (Diener, 1984; Levy-Garboua and Montmarquette, 2003; Kahneman, 1999; Manski, 2000; Bertrand and Mullainathan, 2001; Frey and Stutzer, 2002; Borooah, 2005).

In Table 2 we present the mean of the respondent subjective well-being conditioned on the relative wage information.

Insert Table 2

As observed in this table, the marginal SWB mean seems to respond to changes in the relative wage position. Those earning a wage higher than those in their same occupation report to be happier than those with the same or less relative wage. Those unaware of their relative position in the wage distribution have the lower SWB levels. In the following we use the relative wage position information in order to condition discuss how SWB changes as an individual learns about his relative position.

In a first moment, imagine that a worker is unaware of his position in the wage distribution, i.e. he is in the veil of ignorance state, VI_i. In a second moment, this worker worker receives information and learns his position in the wage distribution, i.e. relative position state, RP_i. Therefore, if we want to discuss how SWB of an individual is affected by this

learning process, we could estimate

$$\triangle(S) = [E(S|RP_i, X_i) - E(S|VI_i, X_i)].$$

where S is the declared level of SWB, X_i $i-th$ individual's characteristics. If both observations were available for the same individual, then we could easily estimate $\triangle(S)$ using the conditional mean sample analog. The problem is that only one of the two states are observed for each individual. That is, for each individual we only observe whether he knows his relative position or whether he is unaware of his position in the wage distribution. However, under the assumption of conditional "random assignment" to the RP_i or VI_i states, i.e. there are no systematic differences between those who are informed about their relative wage and those who are not, given the individual characteristics, we could approximate the unobserved state of an individual with that observed state for another individual with similar characteristics. In other words, if we observe an individual that declares he earns more than those in his same occupation, to approximate his veil of ignorance state SWB we could use those individuals that are unaware of their wage relative position but have similar characteristics, i.e. we could use the matching principle,

$$\triangle(S) = E(S|RP_i, X_i) - E(S|VI_j, \|X_i - X_j\| < \varepsilon).$$

where j stands for an individual with similar observable characteristics as i, $\|X_i - X_j\| < \varepsilon$, but that is unaware of his position in the wage distribution.

In Table 3 we present the estimation of the above difference in a double entry matrix: the rows represents the original-base state while the column the final state, i.e. what happens to the mean SWB for an individual who is unaware of his position in the wage distribution -or believes he earns below what the market pays- when he learns that he earns more, the same or less than those in his same occupation. For example, for the first row and third column we estimate

$$\triangle(S) = [E(S|X_i, w = above_i) - E(S|\,\|X_i - X_j\| < \varepsilon, w = below_j)]$$

matching on similar characteristics. We are assuming that this estimate approximates the SWB change for an individual that learns that he is earning more than his peers when he

originally believed that he was earning less.

Insert Table 3

Overall, this table suggest that being aware of the position in the wage distribution significantly affects SWB. Interpreting the movements in Table 3 as a learning process from an original state, when a worker learns that he is really earning much more or the same than his peers, his mean SWB level increases significantly, i.e. 0.66 or 0.195, when compared with the original state of being unaware of his relative wage position. Or when she originally believes that she earns the same as those in her same occupation, but latter learns that she is really earning a higher wage, the SWB mean increases, though less than in the above case. In other terms, there is a significant association between SWB and our interpretation of "learning about one's relative wage position".

Finally, following the usual strategies of the papers dealing with relative income position, we had estimated the association between SWB and different explanatory variables using an ordered Probit estimation method (see, for example, Luttmer, 2003 or Bride, 2003, among others). In order to simplify the exposition, in Table 4 we had only include the estimated parameters of those variables associated with the respondent information about his position in the wage distribution (Table A.1 in the appendix present all the results). The variable "Same Wage" takes value 1 if he respondents believes that his wage is the same as what the market is paying for his occupation, an 0 otherwise. The variables "Less Wage" or "Higher Wage" are define in a similar fashion. "Satisfaction with absolute wage" takes the value 1 to 5, taking the value 1 if the individual is highly satisfy with his wage level and 5 if he is highly unsatisfied.

Insert Table 4

Given that the reference group are those workers who are unaware of their position in the wage distribution, the signs of the estimated parameters and significance clearly indicate that SWB is affected by the relative wage position. In other terms, the estimates of Table 4 confirm the results of the experimental design as well as of the matching estimator.

CONCLUSION

The only concern of this paper is to contribute to the empirical literature related with studying whether relative position is associated with subjective well-being. We focused on how learning about one's relative position in the wage distribution affects subjective well being. Based on an experimental design and non-experimental data, we found that declared life satisfaction seems to be related with the individual's position in the wage distribution. In particular, learning that one's wage is below his reference group is negatively correlated with subjective well-being.

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Table 1: Experiment result comparing veil of ignorance and after learning the relative position state.

		Satisfaction		Satisfaction movement (%)			
Initial wage	Reference Group Wage	Mean before	Mean after	Increase	Equal	Decrease	Obs.
600	300	3.76 (1.48)	4.35 (2.06)	52.4	28.6	19.0	42
600	900	3.90 (1.60)	1.72 (1.10)	0.00	0.00	100.0	61
1200	900	7.79 (1.18)	7.83 (2.07)	52.0	27.6	20.7	29
1200	1800	7.57 (1.93)	3.43 (2.47)	0.00	14.3	85.6	28

Table 2: Descriptive measures of subjective well-being condition on the information about relative wage position

	Mean	Std	Observations
All	7.53	1.33	1920
Higher Wage	8.04	1.35	47
Same Wage	7.59	1.34	1288
Less Wage	7.38	1.23	458
Unaware	7.30	1.45	127

Table 3: Difference in SWB when matching to workers with different information about their wage.

Public Workers[1]			
Original Base State\Actual Wage relative position	Higher Wage	Same Wage	Less wage
Unaware	0.6598 (0.274)	0.1955 (0.0717)	−0.0378 (0.168)
Same Wage	0.4475 (0.2523)		
Less Wage	0.5963 (0.2383)	0.2209 (0.0812)	

Note: (1) Public workers with overall job satisfaction, free time satisfaction and home economic satisfaction above five; job matches his educational level. Matching variables: age, male, family size, education,tenure, hours of work, occupation, income, social scale, house size in meters. Standard deviations calculated via bootstrap.

Table 4: Relative wage position and Subjective well-being. The omitted cathegory is Not Knowing Relative Wage Position, ie unaware. Dependent variable SWB.

	Public Worker$^{(1)}$	
Relative wage position	Coefficient	P-value
Same wage	0.2031	0.079
Less wage	-.73259	0.061
Higher wage	0.43465	0.037
Satistaction with absolute wage*	-0.1363	0.000
Log-income	0.2326	0.063

Note:(1) Public workers satisfied with their work, with their economic position and with their leisure and working in a job which matches their education level. $(*)$ Satisfaction with absolute wage: 1: highly satisfied; 5 highly insatisfied