

# **Health and Happiness in Uruguay\***

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## **Abstract**

This article presents a study of the relationship between self-reported happiness and self-assessed health status at the individual level, using the Religion, Health, and Young Emancipation ISSP survey for Uruguay in 2008. Probit estimates suggest that better self-assessed health status is highly correlated with greater levels of self-reported happiness. In order to control for the observed heterogeneity, models are estimated using matching methods. Results show that individuals who report themselves to be in good health have a probability of being at the highest level of happiness between 18 and 29 percentage points higher than individuals who report worse health.

**JEL classification:** D60, I31, I12

**Keywords:** happiness, health, matching methods

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## **1. Introduction**

A vast literature exists on issues of life satisfaction and happiness. One of the most striking findings of this literature is that countries with high growth rates show little or no improvement in their levels of happiness (Frey and Stutzer, 2002). This surprising result casts some doubt on the use of standard income-based utility methods to proxy individual welfare. Studies in the economics of happiness are based on surveys in which individuals self-report their levels of happiness or satisfaction with life, instead of measuring well-being through their purchasing power and consumption. In this context, non-economic variables, such as health status, have a significant influence on individual-level life satisfaction (Frey and Stutzer, 2002).

Studies generally find that better self-assessed health is associated with a greater self-reported happiness, and health shocks (such as permanent disabilities) have negative effects on happiness and life satisfaction. The causality seems to go both ways; specifically, health influences happiness and happiness influences health, effects that appear to be mainly due to observed and unobserved characteristics of the individual. Moreover, it is possible that there exists some kind of adaptation with health, i.e., as standards improve over time, people begin to incorporate them. Furthermore, after a certain level is reached, the benefits of increased longevity are secondary compared to others such as better quality of life.

The aim of the present study is to analyze self-reported happiness in Uruguay and its relationship with self-assessed health status. The data are from the Religion, Health and Young Emancipation ISSP survey for 2008.

## **2. Previous Studies**

The literature generally addresses questions concerning the determinants of individual happiness through answers to questions from public-opinion surveys on life satisfaction or happiness levels. Normally, these articles pay special attention to the relationship between happiness and other socioeconomic issues such as health, employment status, educational level, income, and marital status. The role of income in determining life satisfaction is a prominent feature of the literature on the economics of happiness. There exists empirical evidence for the importance of the level of income, changes in income, and relative income among individuals (Frank, 1985; Easterlin, 1974, 2001; Frey and Stutzer, 2002; Gerdthman and Johannesson, 2001; Deaton, 2007).

It is widely accepted that variables other than income also have a decisive influence on the happiness of individuals. One of the most important indicators of happiness and life satisfaction appears to be health status. As stated by Graham (2008): “health is an important determinant of self-reported happiness, transcending national borders and beliefs, as well as the highly subjective nature of the concept.” There is a growing body of literature showing the importance of health status in determining individual well being, measuring health through morbidity, risky behavior, and self-perception. (Gerdthman y Johannesson, 2001). Moreover, the measured effect of health status on self-reported happiness is stronger than other variables, such as education, unemployment, and income.

The literature finds that self-reported happiness is higher for women, individuals who are in better health, those who are married, individuals with more education, religious individuals, healthy, rich people, both young and older adults, and those who are self-employed. Past research has also found that self-reported happiness is lower for

divorced individuals, persons between the ages of 40 and 50, unemployed people, immigrants, and poorly educated individuals (Blanchflower, 2008).

Stutzer (2007) studies the relationship between obesity and self-control problems and happiness through the use of the 2002 Swiss Health Survey and the Subjective Well-Being Questionnaire of Bern. Understanding that obesity has become a serious problem in most western countries, the author examines the role that lack of control has on obesity and its effect on experienced utility. Assuming that a higher body mass index is not necessarily "better" than a lower one (i.e., different levels of body mass do not have a systematic relationship to utility) results for Swiss adults show that obese individuals report lower levels of subjective well-being. Blanchflower and Oswald (2007) study the relationship between happiness and hypertension. Their interest in the relationship comes from evidence that happiness and high heart-rate levels are negatively associated in men (Steptoc, 2005). Using data from the 2001 Eurobarometer for various countries, the authors show that individuals with fewer health problems related to high blood-pressure report the highest levels of life satisfaction.

In the case of Uruguay, the first study of the relationship between self-assessed health and self-reported happiness is Cid et al. (2007), which uses a data set of older adults living in the capital city of Montevideo, based on the Health, Welfare, and Aging Survey (SABE, PAHO/WHO, 2001). The authors find that individuals who tend to report higher levels of happiness also report having better health, are married, and have higher income levels. Individuals self-report lower levels of happiness when living alone and when having poor nutrition. Interestingly, education has no clear impact on happiness for this sample of older Uruguayans. In a follow-up study, Cid et al. (2008) study the relationship between happiness and income, health, household composition, and religion

in the Argentina, Chile, and Uruguay. Using the SABE surveys conducted in 1999 and 2000 for adults over 60 years, the authors find that higher levels of income, being married, and being religious are correlated with greater levels of self-reported happiness, while malnutrition and poor health are correlated with less happiness.

Gerstenblüth et al. (2008), using the 2004 Latinobarómetro Survey for Argentina and Uruguay, find a positive relationship between happiness and good health. In order to control for the potential endogeneity of health status, the authors use matching techniques and find that good health increases the probability of self-reporting the highest level of happiness between 31 and 46 percentage points in Uruguay and between 15 and 27 percentage points in Argentina. Gerstenblüth and Rossi (2009), using the 2007 Latinobarómetro for Uruguay and Chile, estimate the probability of individual life-satisfaction, controlling for the potential endogeneity of health status using propensity score matching. The results show that the health status is positively related to happiness and that the influence of health status on happiness is larger than the effect of other explanatory variable, in line with findings reported in previous research.

### **3. Data and Methodology**

In this study, we estimate the probability of an individual assessing himself or herself as “happy” using data of the 2008 Religion, Health, and Young Emancipation ISSP survey for Uruguay. The binary variable *happy* takes a value of one if the individual reports being “very happy” or “quite happy” and zero otherwise. The question asking for self-assessment of happiness was placed at the beginning of the questionnaire to reduce the problems associated with “order bias” (Graham, 2005). Summary statistics for the entire sample are presented in Table One.

[INSERT TABLE ONE]

Regarding the independent variables, we consider measures that account for the capacities and capabilities that individuals have to face the potential difficulties of everyday life (Deaton, 2007; Sen, 1999). One of the main factors that enables an individual to respond to negative life situations is “good health.” The binary variable *good health* takes a value of one if the individual reports being in “very good health,” “good health,” or “neither good nor bad health” and zero otherwise. Marital status is included to control for spousal and family support in responding to negative life situations; *married* takes a value of one if the individual is married or cohabiting at the time of the survey and zero otherwise. Religious affiliation and regularity of attendance may assist an individual in responding to negative life situations. Dummy variables indicate affiliation with the Roman Catholic Church (omitted), various *Protestant* denominations, and all *other religions*. Religiosity is measured as series of dummy variables indicating the regularity with which an individual attends religious services: never attend (omitted); *attend irregularly*; *attend often*; and *attend very often*.

*Age* and its square are included to control for differences in self-reported happiness at different points in a person’s life. A dummy variable for gender (*woman* = one) is included to control for differences in happiness for men and women. The level of education has been shown to influence self-reported happiness. In this study, education is measured by dummy variables indicating the highest grade-level completed: primary (omitted); *incomplete secondary*; *complete secondary*; *tertiary incomplete*; and *complete tertiary*. As proxies for individual socioeconomic status, we use household income and individual employment status at the time of the survey. Due to lack of suitable continuous data on income, three household-income categories are created: less than US\$5,000

(omitted); \$5,000 to \$15,000; and Over \$15,000. To control for employment status, we create three categories: currently employed (omitted); currently *unemployed*; and currently *inactive*. An individual is *unemployed* if he or she is not currently working but is in the labor force, while an individual is *inactive* if he or she is not in the labor force.

In the social sciences, it is particularly difficult to distinguish between correlation and causation, as generally it is not possible to conduct controlled experiments in which individuals are randomly selected, so that any differences observed between the control and treatment group may be attributable to the experiment (Altonji et al., 2000). From an economic perspective, the factors that affect self-reported happiness can exhibit classic endogeneity problems, so the results may lead to biased estimates of the coefficients. Endogeneity exists if the condition is correlated with the error term. This correlation may result from selection on observables (Rosenbaum and Rubin, 1983) or selection on unobservables (Heckman and Robb, 1985). "Biased" probit estimates can be seen as reflecting a reduced form, reflecting the overall relationship between happiness and its covariates, but not the structural one. The only way to obtain unbiased estimates is by using an estimation method that takes into account these biases, which often requires the use of data that include exclusion restrictions for each potentially endogenous variable.

In the particular case of self-assessed health, "good health" is generally associated with higher levels of happiness. At the same time, numerous studies have found that happy people are healthier. The causality seems to go both ways, probably because personality and other unobservable characteristics determine both phenomena. In order to control for observable heterogeneity, this study uses propensity score matching techniques to find appropriate "control" and "treatment" groups in order to estimate the



causal effect of self-assessed health status (the treatment variable) on the self-reported happiness (outcome variable) of individuals in our data set.

Given that our sample is not from a randomized experiment, and that it is impossible to observe the same individual in the two counterfactual situations, we opt for the method proposed by Rosenbaum and Rubin (1983). In this work, it is important to determine the impact of the treatment variable ( $D$ , health status) on the outcome ( $Y$ , happiness), controlling for a vector number of socio-economic variables ( $X$ ). This approach is based on comparing the results of a treatment group ( $Y_1$ ) with a control group ( $Y_0$ ). If the “treatment group” and the “control group” are created so as to mimic random assignment, differences in self-reported happiness between the two groups can be attributed solely to the treatment (“good health”). If the distribution of results is independent of treatment conditional on the values taken by all the pre-treatment variables (control), it is possible to estimate the average treatment effect on the treated (Rosenbaum and Rubin, 1983), that is,

$$Y_1, Y_0 \perp D \mid X \quad (1)$$

$$E(Y_1 - Y_0 \mid D = 1) = E(Y_1 \mid D = 1) - E(Y_0 \mid D = 0).$$

Traditional methods group individuals that are similar in terms of control variables, but in practice it is difficult to match individuals based on an n-dimensional vector. Therefore, we summarize the pre-treatment characteristics of each individual in a single variable called the propensity score (Rosenbaum and Rubin, 1983). The propensity score ( $p(X)$ ) is the probability of the treatment conditional on pretreatment characteristics. The method is based on the hypothesis that there is a balance of pre-treatment variables given  $p(X)$ , that is,

$$D \perp X \mid p(X). \quad (2)$$

If the balancing property is satisfied, observations with the same  $p(X)$  have the same distribution of observable (and unobservable) characteristics, regardless of their status regarding treatment. In other words, for a given  $p(X)$  exposure to treatment is random, so the treated and control units will, on average, be observationally identical. Rosenbaum and Rubin (1983) show that the correspondence can only be done based on  $p(X)$ , provided that the balancing property holds. In this paper we estimate  $p(X)$ , which is used to match treated and control units. Since the estimates are sensitive to the matching method used, we apply several different approaches (nearest neighbor, kernel and stratification) using the ATT algorithm of Becker and Ichino (2002).

#### **4. Results**

Turning to the results, the estimation predicts that the probability of being happy in Uruguay is 84%. This is larger than the sample probability of 81%. According to the marginal effects from probit model, individuals in *good health* see a 27.6 percentage point increase in the probability of being *happy*. The direction and magnitude of this effect is consistent with the literature, although it is slightly larger than the effect found for Argentina and Uruguay (Gerstenblüth et al, 2008) and for Uruguay and Chile jointly (Gerstenblüth and Rossi, 2009).

[INSERT TABLE TWO]

In this study, we find the same convex age-happiness profile as in the literature; namely, happiness declines with age, reaching a minimum between 45 and 65, and increases above age 65. One possible explanation for the U-shape is that people adapt to their strengths and weaknesses as they age, and they also learn to cope with the disappointment of not achieving the goals they set for themselves earlier in life

(Blanchflower and Oswald, 2008). In other research, there is a significant positive effect for women, but we do not find it in the case of Uruguay. Being *separated or widowed* appears as not significant, while being *married* or cohabiting increases by 10.6 percentage points the probability of being *happy*, which is supported by the international evidence. Average happiness levels are higher for married people, and the effect is positive and long lasting.

With regard to education, lower educational levels (*secondary incomplete* and *secondary complete*) are not significantly different from the excluded category, while having *incomplete tertiary* education increases by 10.8 percentage points the probability of being *happy*. *Complete tertiary* education is not significantly different from the excluded category. The results with respect to education are somewhat surprising, since education is shown to be an important determinant of self-assessed happiness in the developed countries (Graham, 2008). Less surprising are the results with respect to socioeconomic status. The probability of being “happy” appears to increase with household income, and being *unemployed* is related to lower levels of self-reported happiness as compared to the excluded category. The marginal effect of being unemployed versus working is 14.8 percentage points, suggesting that employment status has one of the largest impacts on individual happiness. This is a stylized fact in the literature, which generally finds that unemployment is one of the worst events affecting happiness and one of the most difficult from which to recover.

The results suggest that religious affiliation and religiousness significantly influence self-reported happiness. There are significant differences in terms of happiness for those who do not regularly attend services and those who often attend services compared to non-attenders, with marginal effects of 7.0 and 6.8 percentage points respectively. As

found in other studies, religious affiliation appears to exert an influence on happiness, with Protestants having a 7.7 percentage point lower probability of being *happy* as compared to Roman Catholics.

As mentioned in the previous section, the variable that indicates *good health* may have problems of heterogeneity, so that the results presented in Table Two are reflective of a positive correlation between happiness and good health rather than a causal connection. In order to control for some of this (observable) heterogeneity, we estimate the average treatment effect (having “good health”) on happiness. The average treatment effect on the treated is between 18.1 and 28.9 percentage points according to the different algorithms used to estimate the effect. Except when the approach is performed by the Kernel method, the treatment effect is somewhat smaller than those found in the probit model, suggestive of an upward bias in the naive estimate.

[INSERT TABLE THREE]

## **5. Conclusion**

In this paper, we estimate the probability of being happy in Uruguay with special emphasis on its relationship with self-reported health status. Using the Religion, Health, and Youth Emancipation ISSP survey for Uruguay in 2008, we find that the probability of being happy for Uruguayans is 84%. Overall results are similar to other studies on the impact of socioeconomic variables on levels of happiness (age, sex, marital status, education, religion, and employment status). On the theme of the study, we find a positive and significant impact of health status on the probability of being happy. Having a good health status increases the likelihood of being happy between 18.1 and 28.9 percentage points compared to those who have a lower health status.

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<b>Table 1: Summary Statistics</b>		
<b>N=1,008</b>		
Variable	Mean	SE
<i>happy</i>	0.811	0.392
<i>good health</i>	0.934	0.250
<i>26-45</i>	0.342	0.477
<i>46-65</i>	0.315	0.465
<i>65 and more</i>	0.193	0.395
<i>woman</i>	0.620	0.485
<i>married</i>	0.365	0.482
<i>separated or widowed</i>	0.275	0.446
<i>secondary incomplete</i>	0.333	0.471
<i>secondary complete</i>	0.145	0.352
<i>tertiary incomplete</i>	0.076	0.265
<i>tertiary complete</i>	0.100	0.300
<i>unemployed</i>	0.058	0.234
<i>inactive</i>	0.353	0.478
<i>attend irregularly</i>	0.209	0.407
<i>attend often</i>	0.069	0.254
<i>attend very often</i>	0.132	0.338
<i>protestant</i>	0.137	0.344
<i>Other religions</i>	0.059	0.237
<i>\$5,000-\$15,000</i>	0.389	0.488
<i>over \$15,000</i>	0.228	0.420

Table 2: Results from the Probit Model				
Dependent Variable = <i>happy</i>				
Variable	Coefficient	SE	Marginal effect	SE
<i>good health</i>	0.860***	0.170	0.276***	0.064
<i>26-45</i>	-0.341*	0.181	-0.087*	0.048
<i>46-65</i>	-0.801***	0.202	-0.220***	0.061
<i>65 and more</i>	-0.450**	0.237	-0.123*	0.072
<i>woman</i>	0.065	0.108		
<i>married</i>	0.470***	0.138	0.106***	0.029
<i>separated or widowed</i>	-0.163	0.141		
<i>secondary incomplete</i>	0.076	0.125		
<i>secondary complete</i>	-0.011	0.161		
<i>tertiary incomplete</i>	0.591**	0.258	0.108***	0.033
<i>tertiary complete</i>	0.209	0.201		
<i>unemployed</i>	-0.504**	0.214	-0.148**	0.073
<i>inactive</i>	-0.092	0.135		
<i>attend irregularly</i>	0.321**	0.133	0.070***	0.026
<i>attend often</i>	0.278	0.191		
<i>attend very often</i>	0.319*	0.171	0.068**	0.031
<i>protestant</i>	-0.288*	0.157	-0.077**	0.046
<i>Other religions</i>	-0.021	0.199		
<i>\$5,000-\$15,000</i>	0.262**	0.118	0.061**	0.027
<i>over \$15,000</i>	0.455***	0.143	0.096***	0.026
N=1,008				
Pseudo R <sup>2</sup>	0.1312			
Prob ( <i>happy</i> )=0.842				

\*Significant at 10%

\*\*Significant at 5%

\*\*\*Significant at 1%



<b>Table 3: Matching methods results</b>		
<b>Mathing method</b>	<b>ATT</b>	<b>SE</b>
Nearest neighbour	0.181	0.124
Kernel	0.289	0.071
Stratification	0.239	0.082

Notes:

1) ATT = average treatment on the treated.

2) Standard errors obtained by *bootstrap* command (StataCorp, 2005).