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Economic and social status, health and subjective well-being

The case of Argentina in 1995 and 2006

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Abstract

In this study the probability of being happy and have good health are jointly estimated controlling by the effect of economic, social and demographic characteristics. A bivariate probit model is estimated using data from the World Values Survey for Argentina in 1995 and 2006. The results show that the probability of having good health increases with the socioeconomic status of individuals and the confidence level in institutions (cognitive dimension of individual social capital). In addition, the probability of being happy is positively affected by better socioeconomic status, greater confidence level in institutions, and is greater for married people and men. It also can be concluded that variables associated with financial satisfaction such as number of children and being unemployed present a negative impact on subjective well-being. The results confirm that there is a positive correlation between being happy and being healthy and suggest that it is possible to positively affect the health and well-being of people in social and economic disadvantages encouraging and promoting policies to foster the strengthening of social capital.

Introduction

Currently there is considerable interest in the study of the impact of social and economic variables on health. While it is widely accepted that the health of individuals is determined by personal, environmental and genetic factors, another variables are now increasingly taken into account by epidemiologists, economists and other social scientists in order to explain the outcomes of health, such as the level of education, income and individual social capital stock. Romero, Schmalbach, Vanegas and Eslava (2011) presented the results of a systematic review of more than 800 refereed scientific publications on the social determinants of health, for the period 1980-2011. In this review, the authors included studies examining the link between social variables such as ethnicity, class, gender, income, etc. and inequity, inequality and / or health disparities. The authors highlight the growing number of studies on social determinants of health in the last years of the period analyzed. Just over half of the studies present an empirical approach, a half were conducted in the United States, being the participation of Latin American countries not significant, except Brazil, with 8% of the total studies, while there was no evidence for Argentina.

Also, a growing number of studies have shown empirical evidence about statistically significant relationship between the social and economic conditions and happiness or subjective wellbeing (SWB) at individual level. Happiness economists, in an attempt to minimize the bias underlying in the materialist approach in studies where wellbeing is approximated by monetary income and / or product per capita, particularly studied the relationship between happiness and/ or subjective well-being and economic variables such as absolute and relative income, the employment situation of individuals and inflation, among others. Numerous empirical studies have confirmed the importance of the individual's income level on happiness, and have also generated controversy that led to new hypotheses about the role of relative income and income aspirations.

No less important is the relationship between happiness and health. As pointed out by Graham (2008), health is one of the most important determinants of self-reported happiness, being its effect on happiness stronger than any other variable, including income. The aforementioned author postulates that good health is associated with higher levels of happiness and health shocks have negative and lasting effects on happiness. She also analyzes the impact of economic variables, such as income, education and unemployment on health and reflects on the possibility and importance of using the results of studies on happiness, health and economic variables for policy development.

Recently, in a study on the causal relationship between self-assessed health (SAH) and subjective well-being in older adults in Buenos Aires in 2000, De Santis (2011) found that the probability of having good or very good health increases with educational level of individuals and when they have enough income to live. In turn, the study concludes that those who report having good or very good health are more likely to be happier. Similar results were found for Uruguayan studies. While the above studies confirm the importance of social and economic factors on the health of individuals, they present some limitations. First, some are studies only include people aged 60 years or more, conducted with cross sections, with the inability to analyze the persistence and evolution of the impact of these variables on health. Besides, causality between health and wellbeing is assumed to be unidirectional. With respect to the latter, Graham (2008) notes that the relationship happiness - health takes place in both directions, due to personality traits and other unobservable variables may be associated with both better health and to greater happiness.

This paper aims to contribute to a better knowledge and evidence about the relationship between health and happiness and the economic and social determinants at the level of individuals. The effect of demographic, economic and social attribute on health status and subjective well-being of Argentine adult individuals between 1995 and 2006 is estimated with data from World Values Survey. The following section outlines some relevant background on

the social and economic determinants of health and on the relationship between happiness and health, especially those included in the analysis to social capital. Then the model and results are presented.

Background

Graham (2008) points out the mechanisms through which the absolute income level impacts on the individuals' health. The empirical analysis of the relationship between health and income across countries and national and local level shows a similar pattern to that found by Easterlin between income and subjective well-being: health is positively correlated with income although income increments are associated with smaller improvements of health. In other words, the impact of income on health is higher in the lowest intervals of income than in the highest ones. This relationship is known in the literature as the Preston curve, since Preston found this relationship between GDP per capita and life expectancy. Preston curve is explained by several factors. First, in low-income countries, it is reasonable to assume that increases in income are translated into significant improvements in living conditions and public health resulting in declines in mortality rates associated with poor water quality, for example. After reaching a greater purchasing power, successive increases in income are associated with improvements in health associated with the introduction of new technologies in the field of health sciences aimed at curing diseases prevalent in developed economies, such as cancer. After reaching high life expectancy, it is hoped that the successive increases in the purchasing power increasingly translate into better health indicators.

Borghesi and Vercelli (2008) cite studies that show income inequality is associated with lower levels of good health, when the sectors covered in the first decile are excluded from the opportunity to participate in social activities that promote healthy life. At the same time, relative poverty may contribute to damage self-esteem and lead to a poor health, especially when there are low chances of promotion or advancement of disadvantaged groups on its own merits. These authors point out that good health is also associated with active social life and relationships, coinciding with the literature that emphasizes social capital as a proxy of a relational good (goods and services that can be consumed only in the company of other individuals). They also mention the influence of education as a promoter of good health, highlighting the relationship between better health and higher differential impacts attributed to better parenting by mothers more educated, better use of resources to family for a healthier lifestyle and greater awareness of preventive health practices is not linear.

Rojas and Carlson (2006) argue that social capital affects health, being this influence conditioned to different types of capital held by individuals. So, working with data from a survey of individuals aged 20 and more years of 1009 families in the Russian city of Taganrog in 1998, estimate a multivariate linear model, using self assessed health as the dependent variable and demographic characteristics, education level, income level and three dimensions of social capital, as well as joint effects of social capital and education and income as explanatory variables. The authors conclude that social capital has a positive effect on health, being the latter positively associated with the level of education. They also recommend considering in detail the different dimensions of social capital to understand more precisely the channels through which it can benefit health through consumption of relational goods.

In a later publication, Tipper (2010) presents an extensive empirical review about the causality between social and economic characteristics and health. The author cites empirical evidence on the negative impact of low wages, insecure jobs and instability on poor health. Likewise, also mentions the influence of marital status in adults as a determinant of self-reported health on mortality rate. As in many other studies, the paper by Tipper finds that married people are healthier than those who are alone. Tipper provides a conceptual discussion about whether the health production function is relevant to each individual or to the whole family. In the first case, the underlying model is the classic model developed by

Grossman in 1972, known as the dictator model, in which the preferences of the members of the family are identical. By contrast, in models that incorporate multi-personal homes, in which it is possible that the preferences of the family members are different in terms of consumption, leisure and health, the relationship between the individual and the members of his family are relevant.

Ahnquist et al (2012) study the impact of social and economic factors on various measures of health outcomes using a sample of men and women between 16 and 84 years of Swedish National Survey of Public Health. The contribution of the authors is to estimate the effect of the interaction between individual economic and social capital on health outcome, measured by self assessed health and physical and psychological conditions. The authors assimilate economic capital to income and other manifestations of economic difficulties, such as the ability of individuals to meet their expenses and possession or lack of cash reserves. Moreover introduce the social capital, a concept widely studied and used by different authors to explain various economic phenomena, to explain the health status. In this paper, social capital is measured by the size of social participation and trust at interpersonal and vertical levels. The authors estimate a multivariate logistic regression model, which include economic capital and social capital as covariates, controlling for demographic and personal variables and then estimate a synergy index between the two types of capital. They conclude that there is a positive relationship between economic capital and social capital with different health outcomes, being this effect enhanced when individuals have both a low economic and social capital.

Subsequently, Sarracino (2010) analyzes the trends in social capital and happiness in several European countries during 1980 and 2001, based on data from the World Values Survey. The author estimate probability models with limited dependent variables to explain happiness and different dimensions of social capital with economic and demographic variables. He finds that more favorable economic conditions impact positively on happiness and social capital, showing both variables an increasing trend over time, with the exception of Great Britain. Thus, the author concludes that social capital and happiness are positively associated.

Wills-Herrera et al (2011) find that subjective well-being is positively associated with the containment provided by membership to social, cultural or environmental organizations, which act as a containment barrier against objective and subjective insecurity. The authors arrive at this conclusion by applying a multilevel model to individual-level data surveyed in more than 20 communities in Colombia in 2006.

From the mentioned papers, it can be concluded that the subjective well-being and health of individuals are positively associated, while both are influenced by the same economic and social variables. This study attempts to provide evidence about the relationship between subjective well-being and health for the Argentine case, incorporating the effect of demographic and economic variables traditionally employed and social capital.

The model
The analysis of the relationship between welfare and health is addressed in this paper by estimating a SAH and a SWB functions in a bivariate probit model, which allows to jointly estimate the probability of being happy and the probability of reporting good health under the assumption that the errors of both functions are correlated.

Let y_1^* y y_2^* two latent variables: health status and subjective wellbeing of the individual i, which are a linear function of a set of explanatory variables and an error term:

$$y_{1i}^* = X_{1i}\beta_1 + u_{1i}$$
$$y_{2i}^* = X_{2i}\beta_2 + u_{2i}$$
(1)

The latent variables can not be observed, but it is possible to observe the dichotomous variables y_1 y y_2, which assume the following values:

$$y_1 = \begin{cases} 1 & if \quad y_1^* > \overline{y_1} \\ 0 & if \quad y_1^* \le \overline{y_1} \end{cases}$$

$$y_2 = \begin{cases} 1 & if \quad y_2^* > \overline{y_2} \\ 0 & if \quad y_2^* \le \overline{y_2} \end{cases}$$

where $\overline{y_1}$ and $\overline{y_2}$ are the values of each latent variable which define the limits of two categories. For instance, y_1 equals 1 (0) if the individual *i* reports his health status is good (bad), that is, if his health function y_1^* assumes a value greater (less) than $\overline{y_1}$.

X_1 and X_2 are matrices of order *(n x k)* and *(n x j)* respectively, containing demographic, social and economic characteristics of the *n* individuals in the sample; α and β are vectors of order *(kx1)* and *(jx1)* respectively, which represent unknown parameters and ε_1 and ε_2 are vectors of random errors normally distributed coming from a joint or bivariate normal distribution .

With two binary variables four possible outcomes can be observed, associated with the different values of the variables y_1 y y_2:
- an individual happy or very happy who reports good or very good health
- an individual happy or very happy who reports poor or bad health
- an individual unhappy who reports good or very good health
- an individual unhappy who reports poor or bad health

Under the assumption that the error terms in (1) are correlated since there are some non observable variables that affect health status and subjective wellbeing at same time, it is possible to specify the probability of each four outcomes as a function of the explanatory variables and the unknown parameters of the model. The model can be estimated by maximum likelihood methods to obtain the slope coefficients of the explanatory variables x_1

and x_2 and the coefficient of correlation between the two error terms.

According to the bivariate probit model presented above, the probability of being happy or very happy and the probability of having good or very good health were jointly estimated. The covariates included in each function are the following:

Probability of have good or very good health	Probability of being happy or very happy
Social capital	Social capital
Age	Age
Age squared	Age squared
Gender	Gender
Being married	Being married
Socioeconomic status	Socioeconomic status
Educational level	Educational level
Number of sons and daughters	Number of sons and daughters
	Being unemployed

Individual social capital, the variables representing the weft and strength of the individual's relationships with peers and other sectors of society, are a determinant of health. Indeed, in line with the literature revised, the people embedded in strong and expanded social networks can get support in case of employment loss or health shocks, while having a safety net which provides protection and support satisfaction. So, it is expected a direct relationship between the probability of reporting good health and individual stock of social capital.

Regarding demographic variables, the empirical literature finds that married people report higher levels of health than those who are separated or widowed, and in some cases, parents' health is negatively affected by the number of sons through the tension generated by the pressure to meet family expenses[3].

As mentioned previously, it is expected that persons with favorable social and economic status have a larger health stock than the less favored. Those with enough income can access to necessary health care, receive good nutrition and afford eventual expenditures in case of health shocks. Besides the absolute income of individuals, their relative income is relevant, which reflects the position of each person relative to others. Vercelli Borghesi (2008) mention studies that analyze how income inequality is associated with lower levels of good health, when sectors belonging to the first deciles are excluded from the possibility of participating in social activities that promote healthy lifestyle. On the other hand, relative poverty is associated with stress and low self-esteem, factors which tend to impair health, especially when there are few chances of promotion or advancement for disadvantaged groups. Therefore, the variables that capture the socioeconomic status of individual are expected to be significant in explaining the probability of being healthy, and those who belong to higher socioeconomic levels are more likely to be healthy than the others.

Finally, it is included the highest educational level attained by the individual as a determinant of the probability of good health, since it can be expected that more educated people are more aware of the benefits of healthy living and are better able to allocating resources for health care.

To explain the probability of being happy, the socioeconomic class to which the individual reports to belong is considered in this study. Traditionally, economists have analyzed the effects of the income variable on individual well-being. The effects of absolute income on welfare, from the pioneering work of Easterlin (1974) are corroborated empirically, reflecting that when starting from very low per capita income levels, increments in income can improve the satisfaction of primary or basic needs and welfare grows accordingly. However, if successive income increments continue taking place, these additional resources maybe are devoted to consumption of luxury goods, which does not guarantee that individuals meet higher order needs linked to self-realization, so the association between happiness and income becomes weak.

Objective data about income of individuals are not available from the survey used to estimate the model, nor another variable highly correlated with it, such as the level of consumption. However, it is available the social class to which the respondent reported belonging: low, working, lower middle, upper middle, or high. Assuming that higher social classes are correlated with higher levels of income, consumption or wealth, it is possible to make

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[3] The variable number of sons and daughters was excluded since it was not statistically significant.

assumptions about the expected relationship between the class the individual belongs to and the probability of being happy. In doing so, the results of the empirical evidence as well as the concept of happiness by individuals in the sample must be considered.

According to the empirical association found in several studies, a positive or no relationship between income and subjective well-being is expected. If consumption is considered, it is interesting to mention the results of different studies about the relationship between happiness and different measures of cumulative consumption in some countries in Europe, America, Australia and Israel summarized by Aparicio (2011). The said author notes the results are not conclusive, because although in several studies the cumulative consumption-happiness relationship is positive, is negative or not significant in others. Aparicio suggests that to understand this relationship, what the person meant by happiness should be considered. Thus, this author classifies the ethical doctrines according to the importance assigned to consumption and wealth for the pursuit of happiness in three groups. The first group includes among others the Cyrenaica and utilitarianism of Bentham, according to which human behavior is governed by the desire for pleasure and aversion to pain, so that happiness can be achieved by incorporating the highest amount of satisfaction that provide pleasure or avoid individuals' pain. In a more moderate position, the doctrine of Aristotle and the Stoics of happiness give importance to the consumption provided it is not excessive. According to Aristotle consumption contributes positively to the pursuit of happiness, but a personal mean term must be achieved between wealth and material scarcity. Finally, Aparicio highlights the consumption ethic based on clarity, sanity and prudence, according to which an increase in consumption contributes to happiness to the extent that is fair, open and supportive. In summary, the effect of belonging to higher socioeconomic classes positively impact people's happiness only if it allows consumption according to the personal concept of happiness.

Furthermore, maintaining the assumption of a high correlation between income and socioeconomic status, income aspired by the individual plays an important role. Available evidence suggests that individuals compare themselves to references groups and develop their aspirations for their income and lifestyle according to those groups. Thus, the level of satisfaction not only depends on the absolute level of income and consumption, but how far current income is from their aspirations. This means that the larger the gap between actual and aspired income, the lower the level of happiness. The aspirational income level is endogenous, in other words, each individual determines it according to the group with which it is compared. The literature indicates that individuals "look up", ie those located in the first deciles of the income distribution have an aspirational income lower than those located in higher deciles. It can be expected, then, that while individuals who enjoy social and economic position more favorable can access more goods and services, they may aspire to higher levels of income and consumption, so that the relationship between class socioeconomic and happiness will not necessarily be increasing.

Among the demographic variables affects subjective well-being, age can be mentioned. As empirical studies show, its effect is on happiness is U-shaped: a negative influence on happiness in the case of younger people and positively in the case of older[4]. This effect can be explained by the difference in aspirations: young people have a greater gap between what they aspire to have and be in life and what is actually achieved. This gap has a negative effect on well-being, hence the downward portion of the U. By contrast, older people have aspirations according to their possibilities; hence aspirational gap decreases and reverses the effect of age, (Aparicio, 2011). On the other hand, it can be expected a positive impact on the happiness of being married or living with a partner, as opposed to being widowed or separated.

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[4] See for example Ball and Chernova (2008)

Finally, the impact of social capital on the probability of being happy is considered. In this study, social capital can be assimilated as indicators of relational goods consumption, ie goods that are consumed jointly with others. Borghesi and Vercelli (2008) mention that sharing activities and goals with others positively influences happiness and life satisfaction, through affective components of interpersonal relationships. In this study, consumption of relational goods is captured through the social capital observed at the individual level. In this regard, Sarracino (2010) conducted a review of studies on social capital, concluding that some authors find in this variable a possible explanation for the Easterlin paradox in the case of the USA: the weakening of the system of beliefs and values over the past decades would explain why happiness has not grown at the same rate as per capita income.

In this study, the main focus is on testing the hypothesis that individuals with higher social capital and more favorable economic conditions are more likely to jointly report good health and happiness. As mentioned previously, be supported by a social safety net provides security and welfare and, in turn, reduces stress by promoting good health. On the other hand, individuals who report to belong to higher socioeconomic classes can afford higher levels of consumption as well as access to health services. The socioeconomic class and the social capital have, in general, measurement errors and are determined by a set of unobservable variables. By estimating the probability of being happy and in good health, allowing the correlation between the errors of both functions in (1), it is possible to consider the effect of unobservable variables simultaneously affect happiness and good health.

The data

Individual observations were used from different waves of the World Values Survey, available on the website of the World Values Survey Association. These surveys are carried out to individuals from the city of Buenos Aires and the rest of the country and collect information on beliefs, values and trust in institutions, in addition to personal, economic and demographic variables. Each wave contains about 1000 observations selected by stratified sampling. For reasons of data availability, we used the 1995 and 2006 waves.
Below the definitions of the variables used in the estimation of the model are presented:

Happiness

It is a categorical variable constructed from responses to the question*: "Considering all things in general, you are:"*

The options are*: very happy, rather happy, not very happy, and not at all happy.*

This question was taken as a proxy of SWB. Since the model requires this variable being binary, it was given the value 1 to responses indicating the individual was very happy or rather happy and the value 0 otherwise.

Self-assessed health (SAH)

It is a categorical variable constructed from responses to the question: *"How would you define your health these days?"*

The options are: *very good, good, fair, poor, very poor.*

This variable, even though depends on the subjectivity of the individual, is considered as a good predictor of actual health, although there may be biases in the responses of the poorest people (Graham, 2008).

To transform it into a dichotomous variable were given a value of 1 to responses indicating that the individual's health was very good, good or fair, and 0 otherwise.

Confidence index (CI)

It is a continuous variable which approximates the cognitive social capital of each individual. It indicates the degree of confidence that individuals have in different institutions. The comparison between the waves is possible by eliminating the effects of counting each year with different amounts of institutions.

The calculation formula was as follows:

$$CI_{ij} = \frac{sum_{confi} - mín}{máx - mín} \qquad where\ j = 1,2,3,4,5$$

sum_{confi} variable represents the sum of the degree of confidence of the individual i at each institution. The term $mín$ represents the minimum value assumed by the variable in the sample while $máx$ indicates the maximum value.

The maximum value that assumes CI_{ij} is 1 for individuals who express confidence in all institutions, while those who do not trust in any institution absolutely corresponding value is 0.

Note that subtracting to the variable sum_{confi} the minimum value and dividing by the gap between its maximum and minimum, the effects of having different amounts of institutions in each year are eliminated.

Should be noted that the observations in which individuals answered "do not know / no answer" on trust in institutions were removed, as well as those that appeared as a missing value.

Active membership (AM)

It is a binary variable that takes the value 1 if the individual is actively involved in at least one sport, social, cultural or union organization, and 0 otherwise.

Age in years.

Age squared in years squared.

Man

It takes the value 1 if the individual is a man and 0 if is a woman.

Married

It is dummy variable that takes the value 1 if the individual is married or living with a partner and 0 otherwise.

Socioeconomic status

It is a categorical variable, obtained from the individual's response to the following question: "Would you described yourself as belonging to the:

The options are:

Lower class, Working class, Lower Middle class, Upper Middle class or Upper class.

This variable is used to approximate relative income and education level of individuals. In the absence of absolute income variable for more than one wave, we chose this variable, although it has some degree of subjectivity, combines lifestyle patterns, income and education.

From the original variable in the survey 4 binary variables were defined:

- Lower SES =1 if the individual answered he belongs to the Lower class and 0 otherwise.

- Working SES = 1 if the individual answered he belongs to the Working class and 0 otherwise.

- Lower Middle SES = 1 if the individual answered he belongs to the Lower Middle class and 0 otherwise.

- Upper Middle or Upper SES[5] =1 if the if the individual answered he belongs to the Upper Middle class or to Upper class and 0 otherwise.

Educational level of the individual

It is represented by three binary variables obtained from the question: *"what is the highest level of education you have achieved?"* There are three possible levels: *Lower, Middle and Upper.*

From the original variable in the survey 3 binary variables were defined:

- Lower =1 if the individual answered he achieved the Lower level and 0 otherwise.

- Middle = 1 if the individual answered he achieved the Middle level and 0 otherwise.

- Upper = 1 if the individual answered he achieved the Upper level and 0 otherwise.

Wave 2006

It is a binary variable that takes the value 1 if the observation was relieved in that year and 0 if it was surveyed in 1995.

Number of children

Unemployed

It is a binary variable that takes the value 1 if the individual is unemployed and 0 otherwise.

The descriptive statistics of the variables above mentioned are presented below:

Table 1. Descriptive statistics of the data

	wave 1995					wave 2006				
	n	mean	Std. Dev.	min	max	n	mean	Std. Dev.	min	max
Happy=1	1079	0,817	0,386	0	1	1002	0,857	0,350	0	1
Healthy=1	1079	0,891	0,312	0	1	1002	0,972	0,165	0	1
C_I	681	0,404	0,177	0	1	604	0,363	0,169	0	1
Active member=1	1079	0,342	0,474	0	1	1002	0,321	0,467	0	1
Age	1079	42,734	17,150	17	89	1002	42,548	17,586	18	88
Age_2	1079	2120,041	1604,755	289	7921	1002	2119,373	1658,426	324	7744
Man=1	1079	0,474	0,500	0	1	1002	0,466	0,499	0	1
Married=1	1079	0,598	0,490	0	1	1002	0,552	0,4975	0	1
LowerSES=1	1079	0,050	0,218	0	1	1002	0,087	0,282	0	1
WorkingSES=1	1079	0,400	0,490	0	1	1002	0,457	0,498	0	1
LowerMSES=1	1079	0,392	0,488	0	1	1002	0,296	0,457	0	1
UpperMSES=1	1079	0,124	0,330	0	1	1002	0,113	0,316	0	1

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[5] *Because the proportion of individuals reporting that belong to the Upper class is very small relative to the other, it was decided to combine it with the upper middle class in a single category.*

LowerEL=1	1079	0,526	0,499	0	1	1002	0,513	0,500	0	1
MiddleEL=1	1079	0,350	0,477	0	1	1002	0,328	0,470	0	1
UpperEL=1	1079	0,123	0,329	0	1	1002	0,158	0,365	0	1
Number of children	1077	1,937	1,790	0	8	999	1,861	1,810	0	8
Unemployed=1	1079	0,119	0,324	0	1	1002	0,070	0,255	0	1

Source WVS Argentina.

The results

The bivariate probit model was used, which allows us to obtain a correlation coefficient between the error terms of the two equations.

The model was run with the whole sample and for men and women separately by using the software Stata 11.0. We used the same explanatory variables but adding the variables number of children and unemployment as explanatory of happiness.The results obtained are presented as follows:

Table 2. Estimation results. Men and women

	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
yvar1 (healthy)						
Active memb=1	0,084	0,139	0,610	0,544	-0,188	0,357
C_I	0,622	0,346	1,800	0,072	-0,056	1,300
Age	-0,019	0,022	-0,850	0,395	-0,063	0,025
Age_2	0,000	0,000	0,040	0,970	0,000	0,000
Man=1	-0,029	0,123	-0,240	0,814	-0,270	0,212
Married=1	0,007	0,134	0,050	0,957	-0,256	0,271
WorkingSES=1	0,361	0,186	1,940	0,052	-0,003	0,725
LowerMSES=1	0,545	0,197	2,760	0,006	0,158	0,931
UpperMSES=1	0,592	0,273	2,170	0,030	0,058	1,126
MiddleEL=1	0,210	0,148	1,420	0,155	-0,079	0,500
UpperEL=1	0,200	0,217	0,920	0,357	-0,225	0,625
Wave_06=1	0,922	0,154	5,980	0,000	0,620	1,224
_cons	1,340	0,537	2,500	0,013	0,288	2,392
yvar2 (happy)						
Active memb=1	0,162	0,100	1,620	0,105	-0,034	0,357
C_I	1,327	0,261	5,090	0,000	0,816	1,838
Age	-0,033	0,017	-1,950	0,051	-0,066	0,000
Age_2	0,000	0,000	1,490	0,136	0,000	0,001
Man=1	0,174	0,090	1,930	0,054	-0,003	0,352
Married=1	0,445	0,101	4,420	0,000	0,247	0,642
WorkingSES=1	0,382	0,146	2,630	0,009	0,097	0,668
LowerMSES=1	0,338	0,151	2,240	0,025	0,042	0,634
UpperMSES=1	0,571	0,199	2,870	0,004	0,181	0,962
MiddleEL=1	0,003	0,102	0,030	0,979	-0,197	0,203
UpperEL=1	0,464	0,163	2,840	0,005	0,143	0,784
Wave_06=1	0,287	0,092	3,130	0,002	0,107	0,467
Numb. of child	-0,068	0,030	-2,260	0,024	-0,127	-0,009
Unemployed=1	-0,361	0,138	-2,620	0,009	-0,631	-0,091
_cons	0,587	0,376	1,560	0,118	-0,150	1,324
/athrho	0,369	0,088	4,180	0,000	0,196	0,542
rho	0,353	0,077			0,193	0,495
Likelihood-ratio test of rho=0:	**chi2(1) = 18,517**		**Prob > chi2 = 0,000**			
Number of obs. =			1282			
Wald chi2(26) =			156.53			
Log likelihood =	-755.20463		**Prob > chi2** =	0.0000		

Table 3. Estimation results. Men

	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
yvar1 (healthy)						
Active memb=1	0,150	0,211	0,710	0,477	-0,264	0,564
C_I	0,737	0,467	1,580	0,115	-0,179	1,653
Age	-0,045	0,035	-1,290	0,197	-0,113	0,023
Age_2	0,000	0,000	0,740	0,459	0,000	0,001
Married=1	-0,244	0,211	-1,150	0,249	-0,658	0,171
WorkingSES=1	0,475	0,265	1,790	0,073	-0,044	0,994
LowerMSES=1	0,647	0,278	2,330	0,020	0,102	1,192
UpperMSES=1	0,437	0,357	1,220	0,221	-0,263	1,137
MiddleEL=1	0,139	0,211	0,660	0,509	-0,274	0,552
UpperEL=1	0,169	0,311	0,550	0,586	-0,439	0,778
Wave_06=1	0,894	0,219	4,080	0,000	0,464	1,323
_cons	1,970	0,822	2,400	0,017	0,360	3,581
yvar2 (happy)						
Active memb=1	0,204	0,161	1,270	0,205	-0,112	0,519
C_I	1,387	0,378	3,670	0,000	0,647	2,127
Age	-0,062	0,026	-2,420	0,015	-0,113	-0,012
Age_2	0,000	0,000	1,710	0,088	0,000	0,001
Married=1	0,490	0,165	2,980	0,003	0,167	0,813
WorkingSES=1	0,438	0,224	1,960	0,050	0,000	0,877
LowerMSES=1	0,351	0,229	1,530	0,125	-0,097	0,799
UpperMSES=1	0,679	0,308	2,200	0,028	0,074	1,283
MiddleEL=1	-0,152	0,154	-0,990	0,324	-0,454	0,150
UpperEL=1	0,476	0,263	1,810	0,070	-0,039	0,991
Wave_06=1	0,414	0,144	2,870	0,004	0,131	0,697
Numb. of child	0,001	0,049	0,010	0,990	-0,096	0,097
Unemployed=1	-0,379	0,185	-2,050	0,040	-0,741	-0,017
_cons	1,428	0,573	2,490	0,013	0,304	2,552
/athrho	0,491	0,136	3,620	0,000	0,226	0,757
rho	0,455	0,107			0,222	0,639
Likelihood-ratio test of rho=0:	**chi2(1) = 14,480**		**Prob > chi2 = 0,000**			
Number of obs. =			616			
Wald chi2(24) =			93.12			
Log likelihood =	-335.99358		**Prob > chi2**	=	0.0000	

Table 4. Estimation results. Women

	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
yvar1 (healthy)						
Active memb=1	0,068	0,191	0,350	0,723	-0,307	0,443
C_I	0,532	0,538	0,990	0,323	-0,522	1,586
Age	0,000	0,031	-0,010	0,990	-0,061	0,060
Age_2	0,000	0,000	-0,500	0,619	-0,001	0,000
Married=1	0,210	0,188	1,120	0,264	-0,159	0,579
WorkingSES=1	0,271	0,266	1,020	0,307	-0,249	0,792
LowerMSES=1	0,449	0,287	1,570	0,117	-0,113	1,011
UpperMSES=1	0,887	0,475	1,870	0,062	-0,045	1,819
MiddleEL=1	0,269	0,214	1,260	0,209	-0,151	0,689
UpperEL=1	0,280	0,320	0,870	0,383	-0,348	0,907
Wave_06=1	0,934	0,221	4,230	0,000	0,501	1,367
_cons	0,858	0,738	1,160	0,245	-0,588	2,305
yvar2 (happy)						
Active memb=1	0,135	0,130	1,040	0,298	-0,119	0,389
C_I	1,261	0,366	3,440	0,001	0,543	1,979
Age	-0,022	0,023	-0,950	0,344	-0,067	0,023
Age_2	0,000	0,000	0,990	0,322	0,000	0,001
Married=1	0,480	0,134	3,580	0,000	0,217	0,743
WorkingSES=1	0,361	0,196	1,840	0,066	-0,024	0,745
LowerMSES=1	0,353	0,206	1,710	0,086	-0,050	0,756
UpperMSES=1	0,527	0,267	1,970	0,049	0,002	1,051
MiddleEL=1	0,114	0,140	0,810	0,415	-0,161	0,389
UpperEL=1	0,463	0,219	2,110	0,035	0,034	0,892
Wave_06=1	0,211	0,122	1,730	0,083	-0,028	0,451
Numb. of child	-0,109	0,040	-2,760	0,006	-0,187	-0,032
Unemployed=1	-0,354	0,211	-1,680	0,094	-0,768	0,060
_cons	0,264	0,505	0,520	0,601	-0,726	1,255
/athrho	0,292	0,122	2,390	0,017	0,053	0,531
rho	0,284	0,112			0,053	0,486
Likelihood-ratio test of rho=0:	**chi2(1) = 5,969**		**Prob > chi2 = 0,015**			
Number of obs. =			666			
Wald chi2(24) =			75.04			
Log likelihood =	-406.947		**Prob > chi2 = 0.0000**			

As can be seen, the probability of having good or very good health has a direct relationship with the trust in institutions and increases with the socioeconomic level. So, belong to the working class, lower middle or upper middle has a positive impact on health in relation to the lower class (baseline). The coefficient associated with the dummy for the 2006 wave is also positive and statistically significant. This variable captures the effect of time on the probability of having good or very good health. The results indicate that confidence, proxy of cognitive social capital exerts favorable influence on health, unlike the structural capital approximated by active membership. This result is consistent with that found by Yip (2006) in Chinese rural communities. The remaining variables were not significant.

Estimates for men and women separately confirm the positive impact of time on the probability of having good or very good health and the favorable effect of belonging to the lower middle and working classes in relation to the low class (baseline). The other variables are not statistically significant.

In regard to the probability of being happy or very happy, the results suggest the positive effect of being married, feel confident with different institutions, belonging to higher social class and being more educated. Alike the probability of being healthy, the probability of being happy or very happy presents an increasing trend during 1995 and 2006. As it was expected, individuals with fewer children and unemployed have less probability of being happy or very happy in regard with others. The number of children may be associated with financial dissatisfaction, since families with more children perceive lower per capita income and have fewer resources to satisfy higher order needs. Being unemployed reduces the probability of being happy or very happy, effect also associated with the financial domain of well-being.

Regarding the structural social capital, the effect of participating actively in social institutions is not statistically significant. The happiness declines with age, although the typical U-shape is not confirmed due the variable age squared is not significant. This result indicates that holding constant the other variables, the probability of being happy decreases as age of individuals increases. In this case, the hypothesis that older people have a lower discrepancy between aspirations and achievements is not satisfied but that gap continues to be relevant even in older adults.

Consistently with other studies, married people and men are more likely to be happy. The economic and social level reported by respondents presents the expected signs: the probability of being happy or very happy increases with the social and economic status of people suggesting that in Argentina the association between SWB and income has not become weak during the period considered. That would mean reacher and more favored people can "buy" or transform material goods into happiness. The results are similar for men and women, except with regard to the variable number of children, which affect only women and is not significant for men.

Finally, it must be noticed the rho coefficient is positive and statistically different from zero in the three estimations, confirming there is a positive association between being happy and being healthy.

Below are the marginal effects of the independent variables on the joint probability of good health and happiness, valued at the average.

Table 5. Marginal effects of the bivariate probit model

Marginal effects of the bivariate probit							
y = Pr(yvar1=1,yvar2=1)							
= 0,838							
variable	dy/dx	Std. Err.	z	P>z	[95%	C.I.]	X
Active memb=1	0,037	0,022	1,710	0,088	-0,005	0,080	0,347
C_I	0,309	0,059	5,220	0,000	0,193	0,425	0,384
Age	-0,008	0,004	-2,040	0,041	-0,015	0,000	40,588
Age_2	0,000	0,000	1,370	0,170	0,000	0,000	1913,120
Man=1	0,035	0,021	1,680	0,093	-0,006	0,075	0,480
Married=1	0,097	0,024	3,960	0,000	0,049	0,144	0,578
WorkingSES=1	0,095	0,031	3,060	0,002	0,034	0,156	0,413
LowerMSES=1	0,094	0,031	2,980	0,003	0,032	0,155	0,370

UpperMSES=1	0,117	0,027	4,330	0,000	0,064	0,170	0,125
MiddleEL=1	0,011	0,023	0,480	0,631	-0,035	0,057	0,382
UpperEL=1	0,090	0,026	3,460	0,001	0,039	0,142	0,154
Wave_06=1	0,109	0,021	5,190	0,000	0,068	0,150	0,470
Numb. of child	-0,014	0,006	-2,260	0,024	-0,026	-0,002	1,777
Unemployed=1	-0,088	0,038	-2,300	0,021	-0,162	-0,013	0,094
(=1) dy/dx is for discrete change of dummy variable from 0 to 1							

As shown, the average joint probability of being healthy and happy is 0.838. Table 5 shows, in turn, almost all marginal effects are statistically significant at 10%. Age presents a negative marginal effect being no significant the effect of age squared. This would indicate that the age-happiness-health relationship is linear: as age increases, the joint probability of having good health and being happy decreases. On the other hand, men and married people have significant and positive marginal effect equal to 0.035 and 0.097 respectively. Similarly, the marginal effects of the variables associated with a higher socioeconomic class and upper educational level are positive and higher regard to lower class and lower educational level individuals, respectively. This may be due to individuals belonging to upper classes are more likely to meet their higher order needs with respect to the lower class. It is observed that the marginal effect of belonging to the working class and lower middle class is similar, ie the difference between these two classes do not add to the joint probability analysis. On the other hand, belonging to the upper middle class has a higher marginal effect than the other classes considered. This result can be interpreted as the fulfillment of the axiom that "more is preferred to less": access to more and better goods can achieve better health and more happiness.

A similar analysis can be performed with the marginal effect of the variables that capture the level of education of individuals. While having completed the middle level has no significant impact on people who have a low educational level, who have reached higher education have a positive and statistically significant marginal effect. Starting from the high positive correlation between the educational level of individuals and their income level, this result confirms the positive association between having higher income with better health and well-being.

The dummy variable that captures the year in which the individual was surveyed also has a positive and statistically significant marginal effect indicating that the joint probability of good health and happiness valued at the average increased by 0.109 between 1995 and 2006. A greater number of children has a negative effect on the joint probability of being healthy and happy; this result could be linked to the negative effects of lower per capita household income and a greater stress. Similarly, being unemployed has a negative and statistically significant effect corroborating the impact of lower incomes, stress and job dissatisfaction.

Finally, it can be seen that the variables related to social capital, active membership and the confidence index, show positive and significant marginal effects, being the effect of the confidence index the highest considering all variables (0.309).

Because social capital is considered especially in this paper the impact of the confidence index on the joint probability of good health and being happy is analyzed for different profiles of individuals, defined according to the following attributes:

Socioeconomic status	Working class – Upper middle class
Educative level	Middle – Upper
Age	Younger than 40 – Over 40
Unemployment	Unemployed – Employed

Number of children	2 (was used for all calculations)
Gender	Man – Woman

Sixteen alternative profiles were defined from combinations of the attributes mentioned above and the marginal effect of confidence index on the joint probability of good health and be happy was calculated for each of them, as can be seen in the last column in Table 6.

Table 6. Marginal effects of the confidence index for alternative profiles.

	Socioeconomic status	Educative level	Age		Unemployment	Number of children	Gender	CI (marginal effects)
			Younger than 40	Over 40				
1	WorkingSES	Middle	yes		no	2	man	*0,195*
2	WorkingSES	Middle	yes		no	2	woman	*0,228*
3	WorkingSES	Middle		yes	no	2	man	*0,243*
4	WorkingSES	Middle		yes	no	2	woman	*0,301*
5	WorkingSES	Middle	yes		yes	2	man	*0,344*
6	WorkingSES	Middle	yes		yes	2	woman	*0,328*
7	WorkingSES	Middle		yes	yes	2	man	*0,394*
8	WorkingSES	Middle		yes	yes	2	woman	*0,431*
9	UpperMSES	Upper	yes		no	2	man	*0,074*
10	UpperMSES	Upper	yes		no	2	woman	*0,087*
11	UpperMSES	Upper		yes	no	2	man	*0,106*
12	UpperMSES	Upper		yes	no	2	woman	*0,138*
13	UpperMSES	Upper	yes		yes	2	man	*0,165*
14	UpperMSES	Upper	yes		yes	2	woman	*0,169*
15	UpperMSES	Upper		yes	yes	2	man	*0,207*
16	UpperMSES	Upper		yes	yes	2	woman	*0,276*

The second and third columns of Table 6 indicate socioeconomic class and educational level of the individual, respectively. The first 8 profiles correspond to individuals belonging to the working class and with middle educational level, while the remaining 8 are in the upper middle class and have achieved a higher educational level. The next column indicates if the individual is older or younger than 40 years. Another feature used for the definition of the profiles corresponds to whether individuals are unemployed or not, indicating in the table as "yes" if the person is unemployed and "no" otherwise. The number of children, shown in the sixth column, was established as 2 since it is the average number of children in the country. Finally, it is specified the gender of individuals combining each of the characteristics mentioned above for both men and women.

From the results shown, it should be noted that the marginal effect of the confidence index is not constant but differs between the various profiles. For example, observing the profiles 7 and 8 is easy to realize that the marginal effect of confidence in the various institutions for a woman over 40 who belongs to the working class, highly educated, unemployed and with sons (0.431) is greater than the one for a man with the same characteristics (0.394). Similarly, a man aged under 40 years of the working class, with middle educational level, employed and with 2 children has a confidence index marginal effect of 0.195, higher than the one for a man with similar characteristics but in a higher socioeconomic class and with a

higher educational level (0.074). The marginal effect of the IC on a female employed of the working class, middle educational level, aged over 40 years and with 2 children (profile 4) is superior to the one for a woman with the same profile except the labor status (profile 8). Analysis of the CI marginal effects for different profiles allows to conclude these effects will be greater for female individuals, who are unemployed, aged above 40 years, less educated and belonging to the working class.

Final remarks

In this study the relationship between subjective well-being and health, controlling for the effect of demographic, social and economic situation and individual social capital in Argentina during the period 1995-2006 was analyzed.

It was corroborated the link between socioeconomic status and well-being and health. People who belong to higher social and economic strata and have more years of formal education are most likely to report good health and high levels of subjective well-being. This result indicates that it is possible to create conditions for improving the access to equal opportunities and decrease the gap between those healthiest and most happy and the rest by applying lines of social inclusion and reduction of inequality policies.

The results also support the conclusion that the probability of being happy and healthy are related to the social and economic context in which individuals interact. The results suggest that it is possible to affect positively the health and well-being of the less favored by encouraging and promoting the strengthening of social capital. In this regard, it has been shown that the distrust about institutions adversely affects the well-being of the population, so that institutional strengthening should not only be motivated by political and economic considerations, but also by the implications it has on people and their right to be healthy and happy. The analysis allows saying that the improvement in the confidence about the institutions would have a greater potential effect on women over 40, unemployed, of low socioeconomic class and with a middle educational level, that is, on the most vulnerable groups with fewer labor market opportunities.

On the other hand, participation in voluntary organizations as a proxy of structural social capital did not show a statistically significant impact on health and happiness in the period analyzed, with the exception of the marginal effect of active membership on the joint probability of good health and happiness of women, although small.

The results suggest that efforts to improve the health and well-being of the population are not confined to a specific area, but involve jointly responsible for health policy, education, housing, as well as the factors that define the institutional and economic conditions.

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