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Happiness, Life Satisfaction, Well-being: Survey Design and Response Analysis

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Abstract

Several well-established surveys ask questions in order to measure subjective well-being. In some questionnaires, questions relate to happiness, in others, to individual well-being or satisfaction or to both happiness and satisfaction. In the literature of happiness, several papers have compared responses to these questions using available national and international data. However, employed data sets make it hard to properly disentangle wordings or scale effects from other survey design or survey administration effects. For this reason, we design a single *ad hoc* survey in which we ask the same respondents to answer more than one well-being question. In addition, we use standardized scales across questions.

We show that wording clearly matters: each subject self-reports her/his own happiness, life satisfaction, and well-being differently. We found that subjects do not perceive themselves as equivalent to one another and their determinants turn out to be different. Moreover, we find that the use of different scales leads to different results. However, the coefficients of the determinants across different notions of welfare and across different scales never reverse the sign.

JEL Classificarion: B21,B41,C83,D03,J28

Keywords: Happiness, Satisfaction, Well-Being, Survey Design, Response Behavior

1. Introduction

What is happiness? What makes people happy? How do we measure happiness? In the last 15 years, a new and challenging area of economic research has emerged. Discussion over subjective well-being and over how both individual and societal well-being might be improved have become a major topic of theoretical and empirical research – for example, Frey and Stutzer (2002), Blanchflower (2008), Layard (2005), and Becchetti et al. (2014) among others.

The academic debate has spread into political agenda. In 2008, the French Government nominated the Commission on the Measurement of Economic Performance and Social Progress (the Stieglitz-Sen-Fitoussi *Commission)* to investigate the scope of the traditional indicators used to measure economic development. The aim was twofold: to take in to greater account the environment and the sustainability of the economic development, and when measuring growth, to include measures of quality of

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life, inequality, and subjective well-being besides the usual economic indicator[1]. As a consequence, in Sen's words, even if happiness (or subjective well-being) might not be the ultimate goal of the public policy, it can be important to recognize that "first of all, it does matter (and that is important), and second, it can often provide useful evidence on whether or not we are achieving your objectives in genera". (Sen, 2008, p. 27).

Social science research generally uses large-scale surveys, containing direct questions on individual subjective well-being and on demographic and socio-economic variables – for example, the *Word Values Surveys*, the *German Socio Economic German Panel or* the *National Well* Being Survey *by the ONS in UK and The multipurpose survey "Aspects of Italian daily life"*. In some surveys, questions relate to happiness, and in others, to individual well-being or satisfaction or to happiness and satisfaction. Many authors, such as Cummins (2003), Bjorskov (2010), Diener (2009), Helliwell and Putman (2004), Lim (2008), Helliwell et al. (2012, 2013), Rojas (2004), and Diener and Biswas-Diener, (2008), extensively discuss and evaluate the distribution of responses comparing different wordings and different scales. Besides, they also discuss the complexity of the relation between well-being, happiness, and satisfaction.

However, to our knowledge, the available data do not allow a direct comparison between happiness, well-being, and satisfaction in a single survey. Our work tries to fill this gap. Our main research questions are the following ones:

(1) Are the notions of "happiness", "life-satisfaction", and "well-being" equivalent empirically such that it is possible to justify the substantial interchangeability of the three notions in empirical research?

(2) In assessing self-reported happiness, life satisfaction, and well-being do the different scales used give the same empirical results?

[1] In our work, we are interested in individual perception of subjective well-being. Therefore, we refer to the literature on Happiness and Subjective Well-being. We are aware of the existence of another approach in economic and social research in which Well-being or "Qualities of Life" is measured objectively (at least partially). In the capability approach, M .Nussbaum and Sen (1993) focus on a different idea of the quality of life. They use two concepts "functionings and capabilities". "Functioning is what a person manages to do or to be while capabilities are the functioning" that a person could have achieved potentially. Functioning is what we achieved but our capabilities are our real opportunities to do and be what we have reason to value. Both the Subjective Well Being and the Capacity approach extend the idea of welfare economics (not only the utility of goods and services) but we can develop the capacity approach without reference to utility. Basu and . Lopez-Calva (2011).

How did we do this? We expressly designed a survey, using an Italian sample, in which, within the same survey, concomitantly participants answered questions on perceived happiness, satisfaction, and well-being [2] (Research question 1). Moreover, to measure all these three variables, we always used the same three distinct seven Linkert point scales (Research question 2) (see session 3 for details).

The paper is organized as follows: section 2 contains a short review of the literature; section 3 is a brief description of our questionnaire and survey design; in section 4, we illustrate our model; and in section 5, we provide descriptive analysis. Section 6 includes econometrics results, and section 7 includes conclusions and implications for further research.

2. Review of the literature.

Happiness and Wellbeing – Recently, in the Subjective Well Being (SWB) or Happiness Economics (HE) literature, several authors including Bjorskov, (2010), Diener, (2009), Helliwell and Putman (2004) J. Helliwell et al. (2012, 2013), compared the distribution of responses across different countries. For example, by using data drawn from The World Values Survey, the US benchmark survey and Canadian survey, Helliwell and Putman (2004) compared the determinants of responses to both life satisfaction questions and global happiness questions. The authors found that, even if results that were obtained using the two measures were consistent with each other, several social indicators, as trust or unemployment exerted a stronger effect on life satisfaction than on happiness. However, in Helliwell and Putman (2004), the authors used different scales to measure happiness and satisfaction and, as a consequence, it could be extremely difficult to separate the effect of wordings from other differences in survey design and administration of the questionnaire.

By using the data of the Gallup Daily Poll, other authors compared answers of the questions related to happiness evaluation of *yesterday* with answers of questions related to

[2] Our concern is mainly methodological. The difference between the words can be not only semantic but also cultural and this aspect can be relevant when translating from English to any other local language in order to administrate the questionnaire. The use of different words can evoke different concepts according to differences in culture. It is a common knowledge in sociolinguistic and in linguistic anthropology that people's perceptions are conditioned by their spoken language. See Sapir, E. (1929), Sapir and. Morris S.(1946) and more recently Athanasopoulos and Bylund (2013) and Fausey . and Boroditsky .(2011).

overall life evaluation. They found those response patterns were quite dissimilar (see Kahneman and Deaton, (2010), Helliwell and Wang, (2011) and (2014)). Also, Bjorskov, (2010) compared questions upon life satisfaction data from The Gallup World Poll with the ones provided by the World Values. While using the two distinct datasets, considerable differences in the results emerged. The author suggested that in the questions used in the Gallup data, differences in anchoring may cause this discrepancy. Hence, according to them, the two datasets may not be considered substitutes in the empirical analysis. On the contrary, using mainly Gallup data, Helliwell et al. (2011) found that the determinants of happiness were mostly the same all over the world and concluded that the information about the determinants of happiness could be considered robust enough. However, the same authors underlay that nevertheless, it could also be very important to understand whether there are differences in response, and if so, to which factors they might be due. The limit of the quoted literature is that the comparison between happiness and wellbeing is based on matching different international surveys (usually pair-wise comparisons) in which uniformity over questions and scales are not taken into account. See Halliwell et al. (2012).

How are happiness and well-being defined in this literature? What is the meaning usually attached to them? In the psychological literature of SWB, well- being is defined as "Good mental state, including all of the various evaluations, positive and negative, that people make of their lives and the affective reactions of people to their experience", Diener (2006) reported in OECD *Guidelines on Measuring Subjective Well-being*(2013), (p. 10). Moreover, . Mayers and Diener (1995) stated that "SWB is defined by three correlated but distinct factors: the relative presence of positive affect, the absence of negative affect, and the satisfaction of life (Mayers and Diener 1995 p 11). Moreover, Lyubomirsky (2001) defines happiness to include "the experience of joy, contentment, or positive well-being, combined with the sense that one's life is good, meaningful and worthwhile" (p. 239, footnote1).[3] As we can note, the above-quoted notions of well-being refers to life evaluation (cognition), affect (emotion), and to what has been called

[3] Psychologists are aware of the complexity of the issue and of the attribution of different meanings to happiness. For example, Diener writes, "unfortunately, the nature of happiness has not been defined in a uniform way. Happiness can mean pleasure, life satisfaction, positive emotions, a meaningful life, or a feeling of contentment, among other concepts" (Diener et al., 2004, p. 188).

eudemonia – Aristotle's idea that life must have a meaning[4] and should be guided by virtue. The debate between a hedonic idea of happiness and a eudemonic idea has been present in psychological literature. In the first approach, happiness can be interpreted as the result of avoiding pain and looking for pleasure while in the second approach, the emphasis is genuine "relationality" and intrinsic motivation (Deci and Ryan, (2001), Waterman (2007) and Bruni (2010)[5]

In the literature in HE, happiness or well-being and satisfaction are usually considered an approximation of what traditionally economists define as utility[6] embracing the Hedonic view of happiness[7]. If this were the case, then van Praag (2007) is right when he writes, "Mainstream economists mostly do not talk of happiness but of utility. As we said before, the choice of the word in this context is just a matter of taste without consequences" (p. 4). [8]

Recently, especially in the field of behavioural economics, a very active debate began on the meaning of "Utility" in Economics and on what we really measure when we measure what we call utility.

The pioneer work of Kahneman, Wakker, and Sarin (1997) "Back to Bentham? Exploration of Experienced Utility" introduced the distinction between what is called *experience utility* and *decision utility*. According to Kahneman, this decision utility is the weight that we give to outcomes in order to take a decision, while experienced utility is a hedonic experience (linked to the old Bentham concept of utility as pleasure and pain).

4 Aristotle's eudemonia is the best good, which is desired for its own sake. For the sake of this good, we desire either goods because some goods are necessary for living well and doing well. Eudemonia can be seen as an activity of the soul in accordance with virtue and reason (arête). Eudemonia is the goal, the activity and the result of a lifetime. Eudemonia cannot be proper of a child because is not an emotion. It cannot be reached in deprivation It needs motivation, awareness and time and even other goods and desires to be realized... See for example, Farwell .(1995).

5 The psychological literature discusses also the difference between emotion and happiness. For example, Elster (1997, 98) distinguishes happiness from emotion. He considers happiness more as a state of mind than a proper emotion like joy or pain.

6 For example Elster (1997) writes, "No economist to my knowledge has considered emotions in their main role as providers of pleasure, happiness, satisfaction, or utility", where pleasure, happiness, satisfaction seem all to be considered "forms of utility", to use an economics kind of word.

7 For a different position see . Bruni (2010) Becchetti,.Pelloni .Rossetti F(2008)

8 However, recently, Benjamin et al. (2012, 2014a, 2014b) show that subjects' well-being questions may not be appropriate to reveal what people care about. In Benjamin et al. (2012), the authors developed a theory according to which utility might depend on happiness and several other different aspects as health, security and family status among others. Besides, they estimated this "utility" directly through subjects' choices.

In this respect, *experienced utility* can be instant utility – the utility that we experience at the very moment we are asked about our well-being; or remember utility – the utility that comes from the memory of the past[9]. In addition, utility as a whole can also be determined by predicted utility – what subjects think their utility will be in future (Kahneman and Snell, 1992). All these aspects of utility can be related amongst them. For example, decision utility can be formed by experience utility and predicted utility. See Kahneman, Wakker and Sarin (1997).

Relating this discussion to the measure of happiness, the consequence is that when we asked, "How happy are you now?" or "Do you consider yourself overall satisfied?" or "All together, how do you value the quality of your life?", we do not know exactly what utility we try to measure, since we do not know what kind of emotion in a past experience one may refer to, as different words may recall different experiences and emotions to different people. Global retrospective assessments might recall subjects' remembered utility more than instant utility. This latter concept of utility seems to be more linked to emotional state (Urry et al., 2004) from a neurological point of view. In order to disentangle instant utility from remembered utility, Kahneman and Krueger (2006) suggested alternative measures like introducing a battery of questions on satisfaction and not just one question or a particular method to measure experienced utility[10]. The suggested methodology seems easier to be adopted in experiments rather than in well-being surveys. As far as our work is concerned, the difference in distribution that we find in the comparison among the answers on happiness, well-being, and satisfaction, might also be interpreted using the concept of remembered and instant utility. Retrospective assessment and emotion can influence the three variables in different ways. For instance, subjects might recall affect or eudemonia more frequently when using the word happiness than when using the words well-being or satisfaction. However, our work cannot directly tackle the question of utility or different representations of utilities. We simply think that subjects might not perceive happiness, satisfaction, and well-being as the same concept. The three variables might all be linked

[9] Remembered utility might depend on the time span of a negative experience. For example, if the peak of pain we feel during a negative experience is at the beginning or at the end of the negative period, our entire memory of the experience will be different (Fredrickson and Kahneman,(1993), Kahneman, et al. (1993).

[10] Helliwell et al. (2012, 2013), Kahneman, et al. (2004, 2006) suggest introducing more and specific questions especially where emotional variables are involved.

to some idea of utility and they may represent different forms of utility. This will be a very interesting topic for further research.

If the three concepts – happiness, satisfaction, and, well-being – are perceived in a distinct manner, we might expect that some factors will systematically determine subjects' distinct self-valuations under the three different frames or that the three notions may have different determinants. For this reason, in our survey, we asked individuals their subjective evaluation for all three notions. This allows us to compare the answers and the main determinants of the three notions for each subject. Empirically speaking, as in the literature on happiness that reported a level of happiness, we assume satisfaction or well-being are all a proxy of the level of utility. Hence, we also assume the existence of a latent utility variable u, so that $u = f(x_i; \beta; \varepsilon)$, where x_i is the variable that might influence happiness or well-being or satisfaction.

Scales – The second purpose of the paper is to address the scale problem directly. In the literature on happiness, Likert and Cantril scales are commonly used.[11] In most cases, the scales used in the literature have from three to eleven steps. They can be numerical or verbal or numerical with an anchor, unipolar (using only positive or negative numbers), and bipolar (using positive and negative numbers with zero as an anchor).

In psychology and psychometrics[12], there are many studies on the optimal length of the scale at use (including Bradburn et al. (2004), Bradburn, and Sudman, (1974)). In addition there are specific studies on which scale can be more suitable to better measure and represent the subjective judgment of the individual, i.e., which scale it is the best to measure subjective well-being in the most accurate way. For example, J.H Lim (2008) conducted a direct test on 137 respondents in order to compare different Likert-scales of 4, 5, 7, and 11 points with anchor and bipolar for measuring happiness[13]. The paper provides evidences that an 11-point scale leads to a higher mean of happiness than a 7-point scale. The author concluded specifying the underlying necessity in paying attention when different results are compared and if different scales are used, when scales are

[11] See for example Russell (2000) and Carifio et al.(2007).

[12] For example, different scales have been proved to have different effects on different groups of the population.

[13] Lim (2008) refers to "standardized" mean values, and that he precisely discusses the methods of standardization.

directly rescaled. Besides, Cummins (2003) finds that Likert scales and bipolar scales are the one that measures self-assessment judgements more precisely.

Applied economists and econometricians entered into this debate comparatively recently. In the economic literature, the focus is on the effect of the use of different scales on the responses distribution. Pudney (2010) and Conti and Pudney (2011) found that the use of different response categories (different types of interview) as well as the labelling of response scales may influence the distribution of responses. By taking advantage of the change in the survey design of the British Household Panel Survey data, Conti, and Pudney (2011) noted that the usual empirical finding is that the finding that women give less importance to wages but they prefer working fewer hours compared to men is mainly due to a difference in the design of the survey and to the use of two distinct interview modes. However, the dissimilarity in the distribution of responses does not seem to make any difference in the determinants of the level of satisfaction. Recently, using data from randomized experiments (different kind of interviews (response mode), different ways of labelling scales (fully labelled, polar-point labelled with explanations of the oral explanation), and different locations of the questions[14], Holford A. and S. Pudney (2014) found that different scales and interview modes caused distinct distribution patterns of satisfaction and other variables, i.e., satisfaction with health, income, and labour. Nevertheless, there was weak evidence of effects on the location of the questions inside the questionnaire.

In our work, as far as scales are concerned, we always used Likert scales, with seven items; they were always in ascending order (from 1 to 7 or from -3 +3, etc.) in the numerical scale. To measure well-being, happiness, and satisfaction, we used also a verbal scale (adopting OECD terminology (7 steps from "very unhappy" to "very happy"). Hence the scale we used was a totally verbal one, "a unipolar numerical" one (from 1 to 7) and a "unipolar numerical" one with negative and positive numbers (from -3 to +3). Keeping variation at a minimum, the aim of our design was to provide a direct test of the potential framing effects due to the use of different scales.

We expect subjects to be at ease with verbal scales because they correspond to how valuations are mentally formulated. However, since numerical measures are needed to build averages to compare subjects, social groups, different countries or different

[14] *Understanding Society Innovation Panel of British Household Panel Survey,*

times, it is extremely important to know which scale better translates feelings into numbers. That is why we tested two different numerical scales.

First, we wanted to check which of the two numerical scales corresponded most closely to the verbal bipolar one. Second, we expected the unipolar scale with negative numbers to better correspond to the verbal valuations: "Very unhappy"; "Unhappy"; "Slightly more unhappy than happy"; "Neither unhappy nor happy"; "Slightly more happy than unhappy"; "Happy"; and "Very happy". In fact, the first three words imply negative valuations while the last three imply positive valuations. On the contrary, people might not be very familiar with negative numbers, and consequently, they might tend to ignore them.

The effect of the use of different scales represents a new development in the literature on happiness, and our paper addresses this question in the analysis of subjectively perceived evaluations of happiness, satisfaction, and well-being.

3. Survey design.

In autumn 2011, we interviewed 1250 subjects who were a representative sample of the towns of Turin, Alessandria, and Cherasco – a large, a medium-sized and a small town in Northern Italy, Piedmont.[15] Each subject was interviewed face-to-face. Each subject was asked 63 main questions and 69 "sub questions", including demographic information, self-reported level of health, job satisfaction, wealth, qualification, perceived risk and security, valuation of public services like transportation, school, security, and relational goods. The questions were given to subjects in a randomized order. The main objective of the survey was not to mimic the national surveys mentioned above. Our aim was more limited; we wanted to give some elements to regional administrators about the importance of regional public services for well-being. Nevertheless, we used this opportunity to directly test the influence in measurements of different metric scales as well as the perceived subjected individual differences in the words happiness, well-being, and satisfaction. In addition, information on more general variables was used to control whether the overall design of our questionnaire was

[15]Cherasco had 8.802 inhabitants, while Alessandria 89.446, and Torino 902.137 in the year 2011. The size of the town hasbeen shown to nfluence relational goods and the level of happiness, according to Trovato G. et al. (2011) and Bruni L. (2010). Moreover, Cheraso and Alessandria has some geographical and economical aspects in common: both towns are on the river Tanaro and both have the same average income (21000 euro).

correct. As shown in the following discussion, in this respect our results are comparable with the ones of the related literature.

The questionnaire was in Italian. We translated happiness to "felicità", life satisfaction to "soddisfazione per la propria vita" and well-being to "qualità della vita". Soddisfazione and felicità are the words used by ISTAT (satisfaction) and Banca d'Italia (happiness) surveys[16] as translations of satisfaction and happiness. However, we need to mention that happiness and felicità do not have exactly the same meaning in the two languages. for the question "Are you happy?" most English-speaking people will probably answer positively, while most Italians negatively. In an interview by .Bruni, Sen (2013) underlies this difference in meaning.[17] According to us, for Italians, somehow, happiness is a more lasting and deeper concept which is closer to a eudemonic than to a hedonic interpretation[18]. The translation of well-being was a bigger problem. In Italian, the literal translation of well-being is welfare ("benessere"), which is a word related to money and not at all to affection, emotion, or eudemonia. We translated well-being with "qualità della vita" [19]since the latter concept includes every aspect of life, material as well as that of affection and/or inner motivation. [20]

[16] Istat uses the word "Soddisfazione" as a translation of "Satisfaction" in the yearly survey "Aspetti della vita quotidiana "(Aspect of everyday life) over a sample of 25000 Italian families while "Felicità" is the used translation of Happiness by the Bank of Italy on the Indagine sui bilanci delle famiglie Italiane (Survey over Italian Familily Income).

[17] http://www.vita.it/it/article/2013/02/18/la-differenza-fra-benessere-e-felicita-individuale/122725/) (Città Nuova n.3/2013). Comparing definition of happiness and felicità in Enciclopedia Britannia and Treccani also reveals the different weight given to eudamonia versus heudonia in the two languages..

[18] We do not have anything equivalent to the English word "happy" in our day-to-day life language. Most people will give "no" as an answer to the question "Sei felice?", but "bene" (well) to the question "sei contenta? Stai bene? ?" which means "How do you feel?".

[19] The word" quality of life" is used in questions to asses overall subjective perception of quality of life in Health Economics as well as in Social Psychology (Happiness and Satisfaction are also used) See for example The World Health Organization in its Quality of Life (WHOQOL) survey and in the McGill Quality of Life Questionnaire. For a discussion over the evaluation of quality of life, see for example Ubel et.al. (2003).

[20] This is also true for other languages like Spanish or French, and I suppose for non neo-Latin languages. There is no one to one translation of words between languages and concepts like well-being and happiness are cultural sensitive. To use an anecdotic explanation, you are a young Italian researcher who is working in the States or in the UK and you earn much more than in Italy for the same job and from a practical point of view, you have a much easier life than in Italy. Never the less this younger researcher wants to go back to Italy. To the question, "why?" she will answer, "oh the quality of life is completely different!" and if you ask for an explanation she will say "of course the food, the weather, the people, the social relations, the way to spend your spare time, the wine…" Not all these elements and nuances are contained in the word "benessere".

Moreover, in order to measure the above notions of happiness, well-being, and satisfaction, we also asked the same question twice, using two different measurement scales. For the concept of happiness, we used a bipolar verbal scale and a numerical unipolar scale going from 1 to 7. For the concept of life satisfaction, we used a bipolar verbal scale and numerical unipolar r scale with negative numbers going from -3 to +3, which included zero as a value. For the concept of well-being for all subjects, we used the verbal scale, whereas in one-half of the sample (Questionnaire A) we used a unipolar numerical scale and in the other part of the sample (Questionnaire B), we used a unipolar numerical scale with negative numbers. Given below for the appropriate examples.

The two questionnaires, A and B (50% of the sample each) are identical, except for the questions on well-being and for the position of questions on happiness and satisfaction, which are placed in a different order at the same distance. We used a questionnaire containing 63 "main" questions and 69 "sub-questions". To avoid order effects, we randomized the order of all the questions included the three questions related to well-being satisfaction and happiness.

Let us consider the questions in detail:

- *Life Satisfaction*:
    - Question 1 (verbal): "Altogether, how satisfied are you with your life?" – "Very unsatisfied; Unsatisfied; Slightly more unsatisfied than satisfied; Neither unsatisfied nor satisfied; Slightly more satisfied than unsatisfied; Satisfied; Very satisfied" (Likert scale with seven items)[21].
    - Question 2 (numerical unipolar with negative numbers): "Altogether, on a scale from -3 to +3, with the related answers "-3; -2, -1; 0; +1; +2; +3" (where -3 represents the most negative valuation and +3 the most positive one) how satisfied are you with your life?"[22].
- *Happiness*:
    - Question1 (verbal): "Altogether, how happy do you feel?" with the 7 point scale of related answers "Very unhappy; Unhappy; Slightly more

[21] Placed in position 15 in questionnaire A, and in position 30 in questionnaire B.

[22] Placed in position 30 in questionnaire A, placed in position 15 in questionnaire B.

unhappy than happy; Neither unhappy nor happy; Slightly more happy than unhappy; Happy; Very happy".[23]

- Question 2 (numerical unipolar): "Altogether, on a scale from 1 to 7 (where 1 represents the most negative valuation and 7 the most positive one) how happy do you feel?"[24]

- *Well-being*:
  - Question 1 (verbal): "All together, how do you value the quality of your life?" with the 7 point scale of related answers "Very bad; Bad; Rather bad; Neither bad nor good; Rather good; Good; Very good"[25].
  - Question 2 (numerical unipolar, with negative number): "All together, on a scale from -3 to +3 (with the related answers "-3; -2, -1; 0; +1; +2; +3", where 3 represents the most negative valuation and +3 the most positive one) how do you value the quality of your life?" [26].
  - Question 3 (numerical unipolar): "Altogether, on a scale from 1 to 7 (where 1 represents the most negative valuation and 7 the most positive one) how do you value the quality of your life[27].

4. The Model

Economics deals with decisions in a world of scarce resources. Hence, the underlying idea is the maximization of utility while choosing between alternatives. The standard theory usually assumes that individuals reveal their preferences through their choices. Hence, choices are observed directly, not utility. Recently, the idea that utility can be directly observed and measured and that the concept of utility is highly correlated with emotions and feelings is back in the economic debate. Kahneman, Wakker, and Sarin (1997) reintroduced a Bentham's concept, the so-called experienced utility. This kind of utility is linked to the concept of happiness and can be measured. Naturally, this concept of utility brings up the debate on the ordinality versus cardinality of the utility

[23] Placed in position 21 in questionnaire A, placed in position 35 in questionnaire B.

[24] Placed in position 35 in questionnaire A, placed in position 21 in questionnaire B.

[25] Placed in position 40 both in questionnaires A and B.

[26] Placed in position 26, in questionnaire A.

[27] Placed in position 26, in questionnaire B.

function. In the literature of happiness, the assumption of cardinality is not always present. Usually, it is assumed that the reported level of happiness, satisfaction or well-being is a proxy of the level of utility. Hence, we assumed a latent utility variable u, so that $u = f(x_i; \beta; \varepsilon)$, where x_i are the variables that might influence happiness or well-being or satisfaction, β are the parameter vectors and ε is the vector of the random error. We estimated a different u for each of the happiness, well-being, and satisfaction variable and for each scale that had been used to measure these variables.

5. Data and Descriptive Statistics

Our sample contained 1250 individuals living in Piedmont, a Region in North of Italy. The sample was stratified by age and gender, extracted randomly from the whole population. The face-to-face interviews involved 900 individuals in Turin, the largest city (around one million people). A sample of two hundred and fifty subjects lived in Alessandria, a middle-sized town. Finally, one hundred subjects lived in Cherasco, a small town in Cuneo province. The response rate was very high – 1241 out of 1250 subjects (See footnote 15).

The questionnaire contains questions regarding social life, perception of security, community relations, and so on.

Using a single survey, we wanted to understand whether the use of different terminology was required in order to define a broad concept of welfare. "Happiness", "life-satisfaction", and "well-being" lead to different subject answers and dissimilar econometric results. The same aim is extended to the use of different scales to measure the different level of welfare – verbal, numerical unipolar, and numerical unipolar with negatives numbers.

We started from a very simple visual inspection of the analysis of the mean difference T-tests. Figure 1 shows the distribution of the self-assessment of the level of utility, using the three different wordings. Figures 2A and 2B compare the distribution of the self-reported welfare using different scales.

Figure 1

Figure 2A

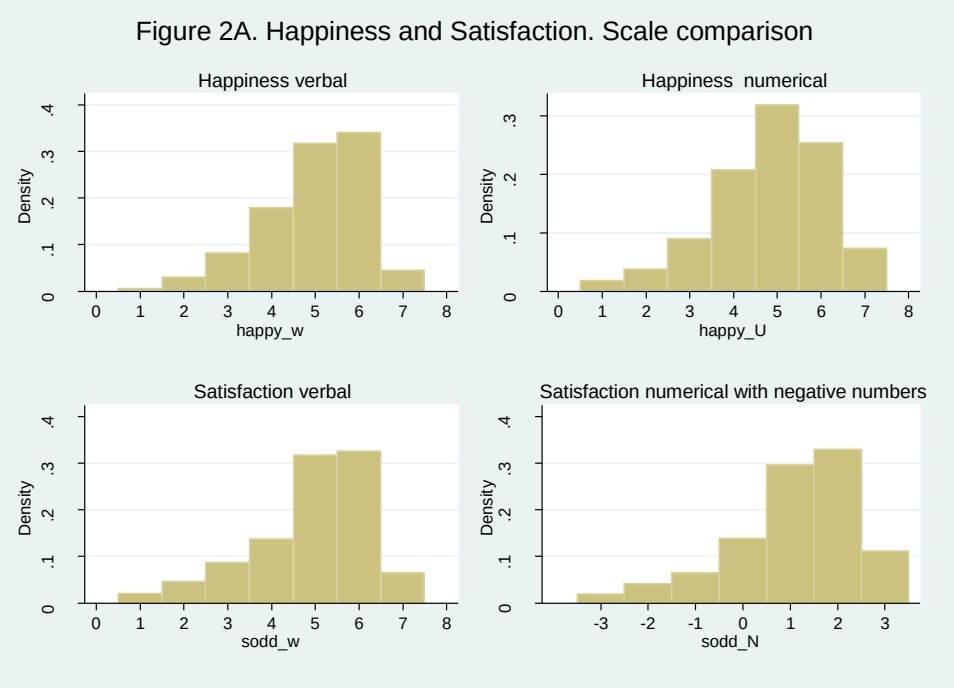
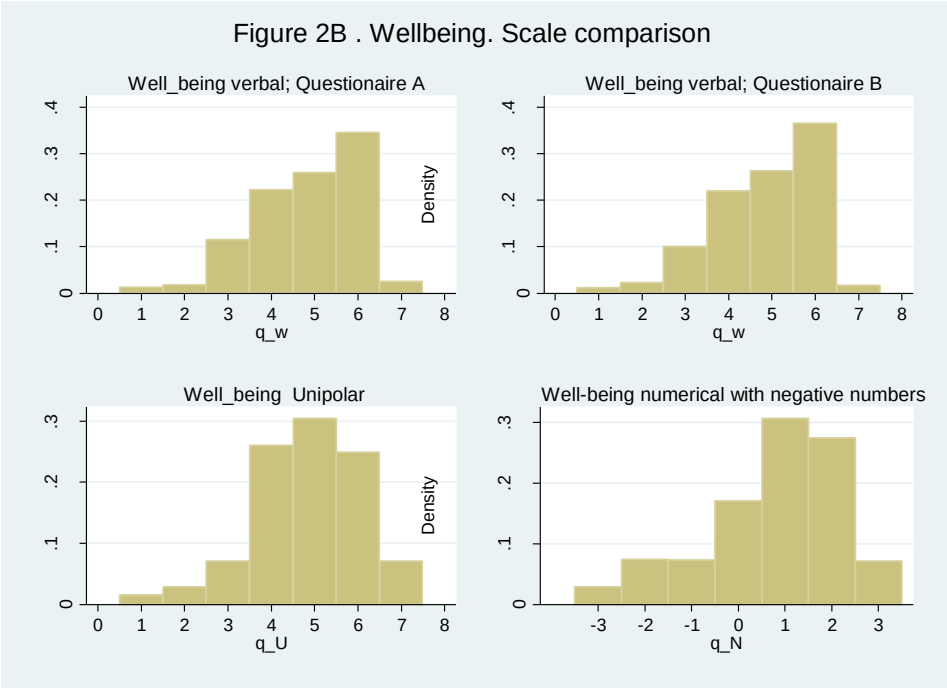


Figure 2B



In Tables 1A-1C, we report the results of the mean-difference T-test , while results of Mann-Whitney U test is reported in table 2 [28]. The three figures clearly show how both different terminologies and different scales present distinct shapes in the response distributions. T-tests partially confirm visual inspection analysis[29]. We found that when measured with a verbal scale, mean differences are significant between happiness and well-being and between satisfaction and well-being. No significant difference emerges between happiness and satisfaction. Regarding scales (Tables 3A-3D) , significant differences emerge both between happiness verbal and happiness numerical and satisfaction verbal and satisfaction numerical with negative numbers[30], while no significant differences are found between self-reported well-being verbal and both well-being numerical unipolar and well-being numerical with negative numbers. In order to investigate whether the two independent samples (Questionaire A and B) were selected from populations having the same distribution , we performed Mann-Whitney

[28] de Winter and Dodou, 2010 discuss the use of The Mann-Whitney U test compared to T-Test to compare differences between two independent groups when the dependent variable is either ordinal or continuous, but not normally distributed).

[29] Wilcoxon signed-rank tests provide similar results.

[30] We transformed answers to negative numbers – from -3 to 3- to a scale from 1 to 7.

U test (Table 2) between the responses to identical questions placed in different points in questionnaire A and in questionnaire B. In all cases, we found that the null hypothesis could not be rejected; and therefore, we can conclude that distributions between two samples are equivalent for all measures of welfare.

Table 1.A Mean differences T-test Happiness vs Well being

Variable	Observation	Mean	Std. Error
Happiness verbal	1211	4,97	0.038
Well- Being verbal	1211	4.85	0.034
Mean difference	1211	0,123	0.028
Mean (diff)	t=4.380		
Mean(diff)!=0	Pr(|T|>|t)=0.0000		

Table 1.B T- Mean differences test Happiness vs Satisfaction

Variable	Observation	Mean	Std. Error
Happiness verbal	1211	4,97	0.034
Satisfaction verbal	1211	4.92	0.039
Mean difference	1211	0.47	0.028
Mean (diff)	t=1.68		
Mean(diff)!=0	Pr(|T|>|t)=0.0938		

Table 1.C Mean differences T-test Well Being vs Satisfaction

Variable	Observation	Mean	Std. Error
Satisfaction verbal	1211	4.92	0.039
Well-being verbal	1211	4.85	0.035
Mean difference	1211	0.077	0.032
Mean (diff)	t=2.41		
Mean(diff)!=0	Pr(|T|>|t)=0.0160		

Table 2. Mann-Whitney test between sample (questionary 1 and questionary 2)

Variable	Z	Prob >|z|
Satisfaction verbal	0.786	0.4319
Satisfaction numerical	-1.334	0.1823
Happiness Verbal	1.830	0.067
Happiness Numerical	0.237	0.8124

Table 3.A Mean ttest – Scale comparisons T-test Satisfaction verbal vs Satisfaction numerical with negative numbers

Variable	Observation	Mean	Std. Error
Satisfaction verbal	1206	4,92	0.039
Satisfaction numerical	1206	5,08	0.039
Mean difference	1206	-0,1600	0.034
Mean (diff)	t=-4.70		
Mean(diff)!=0	Pr(|T|>|t)=0.0000		

Note: bipolar scale is normalized to 1 to 7, so -3 corresponds to 1; 4 to 0 and +3 to 7

Table 3.B Mean ttest – Scale comparisons T-test Happiness verbal vs Happiness numerical unipolar

Variable	Observation	Mean	Std. Error
Happiness verbal	1198	4,97	0.034
Happiness numerical	1198	4,83	0.037
Mean difference	1198	0,143	0.031
Mean (diff)	t=-4.67		
Mean(diff)!=0	Pr(|T|>|t)=0.0000		

Table 3.C Mean ttest – Scale comparisons T-test Wellbeing verbal vs Wellbeing Numerical unipolar- Questionnaire A

Variable	Observation	Mean	Std. Error
Well- being verbal	616	4,83	0.050
Well-being numerical	616	4,84	0.051
Mean difference	616	-0.005	0.043
Mean (diff)	t=0.11		
Mean(diff)!=0	Pr(|T|>|t)=0.9055		

Table 3.D Mean ttest – Scale comparisons T-test Well-being verbal vs Well-being Numerical with negative number- Questionnaire B

Variable	Observation	Mean	Std. Error
Well -being verbal	591	4,86	0.048
Well -being numerical	591	4,75	0.058
Mean difference	591	0,102	0.054
Mean (diff)	t=1.9		
Mean(diff)!=0	Pr(|T|>|t)=0.059		

Note: bipolar scale is normalized to 1 to 7, so -3 corresponds to 1; 4 to 0 and +3 to 7

Further, we compute cross-correlations across the three concepts measured on the same verbal scale and between scales assessing the same concept (see tables 4A-4C). We find that correlation is positive and significant, but the fact that the range is between 0.7 – correlation between happiness and satisfaction – and 0.5 – correlation between the quality of life verbal and quality of life unipolar with negative numbers – may suggest that the different measures are not equivalent. A descriptive analysis shows mixed

results. Nevertheless, both visual inspection and descriptive analyses suggest that either wordings or scales may influence response patterns.

Table 4.A. Cross-correlation between Happiness Satisfaction and Quality of Life –verbal scale.

	Satisfaction	**Happiness**
Happiness	0.7072	1
	0.0000	
Quality of life	0.6270	0.6681
	0.0000	0.0000

Table 4.B. Cross-correlations: Happiness and Satisfaction –verbal vs numerical scales.

	Satisfaction verbal		**Happiness verbal**
Satisfaction numerical with negative numbers	0.6172	Happiness numerical	0.6442
	0.0000		0.0000

Table 4.C. Cross-correlations: Quality of life –verbal vs numerical scales.

	Quality of life verbal
Quality of life numerical	0.6459
	0.0000
Quality of life numerical with negative numbers	0.4990
	0.0000

In the next section, we show how differences in survey responses lead to dissimilar econometric results. We compare the results of the same estimated model on the same sample, using the three different notions and the three different scales.

6. Econometric results

One of the main questions we want to tackle is whether satisfaction, happiness, and well-being are equivalent notions. By using a single ad hoc designed survey, we tested the equivalence of these three different notions. We compared the results of the same model, on the same sample of respondents, putting, on the left side, life satisfaction, happiness and well-being and, on the right side, the same determinants. If these three notions are equivalent, their determinants should not be different.

Table 5 shows descriptive statistics of the key variables used in all regression models for the three different samples.

Table 5 –Mean of key dependent variables

	Sample 1	Sample 2	Sample3
Happiness verbal	4.97 (1.17)	4.93 (1.14)	5.02 (1.21)
Happiness numerical	4.82 (1.31)	4.80 (1.37)	4.84 (1.24)
Satisfaction verbal	4.92 (1.34)	4.92 (1.28)	4.92 (1.40)
Satisfaction numerical with negative numbers	5.08 (1.35)	5.08 (1.46)	5.07 (1.24)
Well-being verbal	4.84 (1.20)	4.86 (1.19)	4.83 (1.22)
Well-being numerical	4.84 (1.24)	-	4.84 (1.24)
Well-being numerical with negative numbers	4.75 (1.45)	4.75 (1.45)	-
Trust	4.92 (1.52)	4.89 (1.54)	4.94 (1.49)
Freedom	3.84 (1.45)	3.79 (1.45)	3.88 (1.45)
Optimistic %	0.69	0.70	0.67
Good social life %	0.83	0.83	0.83
Easy life %	0.52	0.54	0.50
Attitude toward risk	3.25 (1.48)	3.25 (1.50)	3.26 (1.46)
Security	3.74 (1.17)	3.72 (1.24)	3.76 (1.10)
Health Satisfaction	5.44 (1.34)	5.40 (1.37)	5.49 (1.31)
Free Time Satisfaction	5.02 (1.35)	5.00 (1.36)	5.08 (1.34)
Males %	0.48	0.48	0.47
Average Age	48.3 (18.17)	48.8 (17.8)	47.8 (18.5)
Unemployed%	0.11	0.11	0.11
Number of children	1.03 (1.07)	1.04 (1.04))	1.03 (1.10)
Alessandria %	0.20	0.21	0.20
Cherasco %	0.08	0.07	0.08
N	1211	616	591

Note:. Standard error in parenthesis.

Sample 1 contains those individuals who answered to all the three verbal scale questions. Sample 2 and Sample 3 contain individuals who answered to questionnaire A or questionnaire B. In questionnaire A subjects answered to questions on well-being

measured with a Likert scale from -3 to +3, while in questionnaire A measured with a scale from 1 to 7 . Verbal scale measure was included in all the tree samples.

The estimates were obtained using the sample of those individuals who answered to all the three notions – measured with the verbal scale. We performed the analysis using OLS and OPROBIT strategies obtaining similar results. OPROBIT results are reported in Table 6[31]

As expected, being satisfied with one's family economic situation, social life, leisure time, health condition, independence, being a person who trusts people and has a fixed partner, are all variables that exert positive and significant effects on all the three notions of welfare. In addition, being unemployed exerts a negative and significant impact on all the three notions of welfare.

At the first glance, our results seem to be rather similar when running regressions on life satisfaction, happiness, and well-being. However, several differences emerge: focusing on single variables, we found significant differences (the Hausman tests are reported in note) in coefficients across models for student status, which exerts positive and significant effects only on well-being measures, and living in a middle-size town does not exert any effect on satisfaction.[32] Even if not statistically significant, some other difference emerged: health satisfaction shows a coefficient equal to 0.083 for well-being, 0.13 for happiness, and 0.14 for life satisfaction. Interestingly, risk attitude exerts a significant effect only on satisfaction. More risk-prone people seem to be less satisfied. This fact may be due to a correlation between risk proneness and aspirations level (see Loewenstein and Ubel, (2008) and Loewenstein et al. (2001)). Moreover, the number of children is significantly and positively related to happiness. Overall, the values of the three estimated maximum likelihood functions when regressors are controlled are rather different from each other. Interestingly, we found noticeable differences across cutpoints coefficients as well.

[31] For the sake of completeness OLS results are reported in Appendix C.

[32] $\chi 2$ of difference in coefficients related living in the middle size town is 11.86 (0.0008) when we compare happiness and satisfaction and 13.54 (0.002) when we compare satisfaction and well-being. $\chi 2$ of difference in coefficients related to being a student is 10.73 (0.0010) when we compare wellbeing and happiness and 6.57 (0.00104) when we compare well-being and satisfaction.

Table 6 Life Satisfaction Happiness and Well Being Comparison , Verbal scales -Oprobit

	Satisfaction		**Happiness**		**Well-Being**	
Family Economic Satisfaction	0.2287***	(7.71)	0.2331***	(7.75)	0.2499***	(8.18)
Freedom	0.0746**	(3.14)	0.1172***	(4.87)	0.1212***	(4.93)
Trust	0.0687**	(2.71)	0.0609*	(2.38)	0.0728**	(2.78)
Optimism	0.1292	(1.74)	0.0905	(1.21)	0.1581*	(2.07)
Good social life	0.2247*	(2.31)	0.1840	(1.88)	0.1566	(1.58)
Easy life	0.1851**	(2.59)	0.2357**	(3.26)	0.2881***	(3.91)
Risk aversion	-0.2878**	(-2.74)	-0.1543	(-1.46)	-0.0875	(-0.81)
Risk aversion2	0.0429**	(2.82)	0.0221	(1.45)	0.0163	(1.05)
Security	0.1689***	(5.04)	0.1846***	(5.45)	0.2454***	(7.08)
Health satisfaction	0.1297***	(4.52)	0.1398***	(4.83)	0.0831**	(2.85)
Free time satisfaction	0.1068***	(3.79)	0.1030***	(3.62)	0.1442***	(4.98)
Male	0.0334	(0.48)	-0.0066	(-0.09)	-0.0797	(-1.11)
Age	-0.0246	(-1.66)	-0.0389**	(-2.60)	-0.0221	(-1.45)
Age2	0.0003	(1.85)	0.0003*	(2.30)	0.0002	(1.19)
Unemployed	-0.4328***	(-3.50)	-0.5751***	(-4.60)	-0.4513***	(-3.57)
N. of children	0.1489	(1.53)	0.2312*	(2.35)	0.1788	(1.79)
N. of children 2	-0.0303	(-1.14)	-0.0331	(-1.24)	-0.0344	(-1.28)
Education	0.1659	(0.95)	0.0324	(0.18)	0.1291	(0.72)
Education2	-0.0150	(-0.77)	-0.0012	(-0.06)	-0.0061	(-0.31)
Fixed_part	0.3600***	(4.56)	0.3194***	(4.01)	0.2792***	(3.44)
Alessandria	-0.1471	(-1.71)	-0.3941***	(-4.52)	-0.4732***	(-5.33)
Cherasco	0.1741	(1.20)	-0.1554	(-1.07)	0.2946	(1.93)
Manager	0.3353	(1.41)	-0.2118	(-0.90)	0.1378	(0.56)
White Collar	0.1391	(1.39)	0.1085	(1.07)	0.1913	(1.84)
Student	0.0129	(0.08)	-0.1240	(-0.72)	0.5036**	(2.81)
Retired	0.0449	(0.18)	0.2745	(1.08)	0.1065	(0.42)
Other occupation	-0.0260	(-0.15)	-0.1330	(-0.78)	-0.0573	(-0.33)
_cut1	0.8912	(1.64)	-0.3600	(-0.64)	0.9908	(1.77)
_cut2	1.5994**	(2.98)	0.6671	(1.23)	1.6264**	(2.95)
_cut3	2.2879***	(4.26)	1.5710**	(2.90)	2.7581***	(4.98)
_cut4	2.9200***	(5.42)	2.4613***	(4.53)	3.8338***	(6.87)
_cut5	4.0366***	(7.41)	3.6075***	(6.58)	4.8223***	(8.57)
_cut6	5.5785***	(10.10)	5.3224***	(9.57)	7.1433***	(12.32)
Log likelihood	-1435.8138		-1322.1697		-1248.1399	
Observations	1050		1050		1050	
Pseudo R^2	0.16		0.18		0.22	

Note: t statistics in parentheses

$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

We explored these results further computing the Hausman test both for equality of regression coefficients for the full models (Table 7) and for cutpoints coefficients (Table 7A) rejecting the hypothesis of the equality of both regression and cut points

coefficients across satisfaction, happiness, and well-being models. Regressions results suggest that the notions of life satisfaction, happiness, and well-being are not equivalent, even if similar. Discrepancies in responses influence econometric findings significantly.

Overall, we did not find any trade-off in the determinants across the three different proxies of utility, i.e., the coefficients of the determinants never reversed the sign.

Table 7. Hausman test: equality of regression coefficients across Happiness Satisfaction and Wellbeing models, Verbal Scales

Satisfaction vs Happiness	Well-being vs Satisfaction	Well-being vs Happiness
chi2(27)	chi2(27)	chi2(28)
44.37	73.64	53.75
(0.0189)	(0.0000)	(0.0016)

Note: Prob > chi2 in parenthesis

Table 7A. Hausman test: equality of cutpoints coefficients across Happiness Satisfaction and Wellbeing models, Verbal Scales

Satisfaction vs Happiness	Well-being vs Satisfaction	Well-being vs Happiness
chi2(6)	chi2(6)	chi2(6)
35.62	88.28	37.35
(0.000')	(0.0000)	(0.0000)

Note: Prob > chi2 in parenthesis

Factors that determine differences in the self-reported valuations may have an effect on some groups of the population rather than others: for each group of the population the three variables sometimes have different determinants. We explore this issue by estimating the same models separately for males and females (Table 8A and Table 8B).

Table 8A Life Satisfaction Happiness and Well Being Comparison, Verbal Scales -OProbit Males

	Satisfaction		**Happiness**		**Well-Being**	
Family Economic Satisfaction	0.2448***	(5.30)	0.2567***	(5.46)	0.2305***	(4.87)
Freedom	0.0322	(0.90)	0.1045**	(2.88)	0.0507	(1.37)
Trust	0.0648	(1.75)	0.0775*	(2.07)	0.0864*	(2.25)
Optimism	0.0896	(0.82)	0.1243	(1.13)	0.2315*	(2.06)
Good social life	0.3205*	(2.15)	0.3244*	(2.15)	0.2007	(1.31)
Easy life	0.2860**	(2.63)	0.2173*	(1.98)	0.4442***	(3.96)
Risk aversion	-0.4707**	(-2.91)	-0.5066**	(-3.11)	-0.1544	(-0.94)
Risk aversion2	0.0723**	(3.23)	0.0693**	(3.09)	0.0264	(1.16)
Security	0.1658**	(3.14)	0.1192*	(2.24)	0.2829***	(5.18)
Health satisfaction	0.1802***	(4.07)	0.2270***	(5.06)	0.1283**	(2.86)
Free time satisfaction	0.0172	(0.39)	0.0352	(0.80)	0.1142*	(2.53)
Age	-0.0371	(-1.75)	-0.0254	(-1.19)	-0.0117	(-0.54)
Age2	0.0004	(1.95)	0.0002	(0.96)	0.0001	(0.30)
Unemployed	-0.4152*	(-2.41)	-0.6844***	(-3.90)	-0.5854***	(-3.31)
N. of children	0.1945	(1.34)	0.1555	(1.05)	0.0436	(0.29)
N. of children 2	-0.0358	(-0.86)	-0.0228	(-0.53)	0.0223	(0.51)
Education	0.5153*	(1.96)	0.2401	(0.91)	-0.0006	(-0.00)
Education2	-0.0557	(-1.90)	-0.0276	(-0.93)	-0.0005	(-0.02)
Fixed_part	0.2454*	(2.01)	0.2402	(1.95)	0.2043	(1.62)
Alessandria	-0.2319	(-1.84)	-0.3799**	(-2.98)	-0.4763***	(-3.66)
Cherasco	0.0385	(0.18)	-0.2751	(-1.29)	0.3965	(1.78)
Manager	0.0953	(0.34)	-0.3441	(-1.24)	0.0355	(0.12)
White Collar	0.0306	(0.21)	0.0751	(0.50)	0.1981	(1.30)
Student	-0.3326	(-1.36)	-0.2378	(-0.96)	0.3243	(1.26)
Retired	0.4189	(0.98)	0.2555	(0.60)	0.2497	(0.58)
Other occupation	-0.4146	(-0.67)	-0.7579	(-1.21)	-0.2023	(-0.32)
_cut1	0.7592	(0.92)	-0.1883	(-0.22)	0.6812	(0.81)
_cut2	1.4791	(1.81)	0.6859	(0.83)	1.3135	(1.57)
_cut3	2.1344**	(2.60)	1.6703*	(2.02)	2.5211**	(3.00)
_cut4	2.8165***	(3.42)	2.6001**	(3.14)	3.6180***	(4.28)
_cut5	3.8414***	(4.62)	3.6854***	(4.41)	4.5432***	(5.33)
_cut6	5.3498***	(6.39)	5.4093***	(6.39)	6.7697***	(7.78)
Log likelihood	-675.12734		-615.27203		-584.14503	
Observations	490		490		490	
Pseudo R^2	0.166		0.194		0.226	

Note: t statistics in parentheses

$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Table 8B Life Satisfaction Happiness and Well Being Comparison, verbal scale -Oprobit Females

	Satisfaction		Happiness		Well-Being	
Family Economic Satisfaction	0.2083***	(5.16)	0.2227***	(5.45)	0.2608***	(6.22)
Freedom	0.1059**	(3.23)	0.1277***	(3.84)	0.1849***	(5.41)
Trust	0.0864*	(2.40)	0.0631	(1.73)	0.0697	(1.88)
Optimism	0.1571	(1.51)	0.0362	(0.34)	0.0733	(0.68)
Good social life	0.1613	(1.23)	0.0955	(0.72)	0.1441	(1.07)
Easy life	0.1082	(1.11)	0.2396*	(2.42)	0.1586	(1.57)
Risk aversion	-0.0543	(-0.37)	0.1730	(1.16)	-0.0010	(-0.01)
Risk aversion2	0.0037	(0.17)	-0.0271	(-1.20)	0.0034	(0.15)
Security	0.1644***	(3.71)	0.2303***	(5.11)	0.2374***	(5.15)
Health satisfaction	0.0933*	(2.40)	0.0695	(1.78)	0.0321	(0.81)
Free time satisfaction	0.1887***	(4.96)	0.1568***	(4.11)	0.1790***	(4.61)
Age	-0.0246	(-1.14)	-0.0724***	(-3.30)	-0.0484*	(-2.17)
Age2	0.0002	(1.17)	0.0007**	(3.19)	0.0004*	(2.12)
Unemployed	-0.4726**	(-2.59)	-0.4288*	(-2.33)	-0.2845	(-1.52)
N. of children	0.1288	(0.94)	0.3588**	(2.60)	0.3820**	(2.71)
N. of children 2	-0.0258	(-0.72)	-0.0622	(-1.72)	-0.0964**	(-2.64)
Education	-0.1149	(-0.47)	-0.0955	(-0.38)	0.3776	(1.49)
Education2	0.0185	(0.69)	0.0188	(0.69)	-0.0245	(-0.88)
Fixed_part	0.4931***	(4.50)	0.4761***	(4.32)	0.4003***	(3.58)
Alessandria	-0.0625	(-0.52)	-0.4088***	(-3.34)	-0.4617***	(-3.69)
Cherasco	0.2866	(1.40)	-0.0695	(-0.34)	0.1764	(0.82)
Manager	0.8462	(1.69)	-0.0539	(-0.11)	0.4646	(0.89)
White Collar	0.1974	(1.40)	0.1214	(0.86)	0.1907	(1.31)
Student	0.3214	(1.31)	0.0084	(0.03)	0.7068**	(2.74)
Retired	-0.1837	(-0.58)	0.3442	(1.06)	0.0386	(0.12)
Other occupation	-0.0026	(-0.01)	-0.0754	(-0.40)	-0.0348	(-0.18)
_cut1	0.8264	(1.11)	-0.9304	(-1.16)	1.3979	(1.80)
_cut2	1.5397*	(2.09)	0.3482	(0.47)	2.0654**	(2.71)
_cut3	2.2781**	(3.09)	1.2213	(1.65)	3.1730***	(4.15)
_cut4	2.8905***	(3.91)	2.1110**	(2.84)	4.2669***	(5.53)
_cut5	4.1312***	(5.54)	3.3577***	(4.48)	5.3561***	(6.87)
_cut6	5.7928***	(7.60)	5.1416***	(6.75)	7.8766***	(9.68)
loglikelihood	-739.85223		-686.53763		-644.92286	
Observations	560		560		560	
Pseudo R^2	0.174		0.186		0.233	

Note: t statistics in parentheses

$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Significant gender differences emerge: the Hausman test (Table 9) for full models shows that differences in the regression coefficient for happiness and satisfaction models are statistically significant. However, no significant difference across gender was found for regression coefficients of well-being model[33] as well as for cut points coefficients (Table 9A).

Table 9. Hausman test: equality of regression coefficients models by gender, Verbal Scales

	Happiness	**Satisfaction**	**Well-being**
Male vs females	chi2(26) 39.21 (00.465)	chi2(26) 39.60 (0.0427)	chi2(26) 35.41 (0.1031)

Note: Prob > chi2 in parenthesis

Table 9A. Hausman test: equality of cutpoints coefficients models by gender, Verbal Scales

	Happiness	**Satisfaction**	**Well-being**
Male vs females	chi2(6) 5.65 (00.464)	chi2(6) 4.06 (06687)	chi2(2i6) 4.71 (0.5707)

Note: Prob > chi2 in parenthesis

Moreover, the Hausman test for separate models for males and females (Table 10, Table 10A, Table 11, Table11A) rejects the hypothesis of the equality of regression coefficients and cut points coefficients for all the three full models for females. Instead, no significant effects were found between regression coefficients of satisfaction and happiness for males.

Table 10 . Hausman test: equality of regression coefficients models by gender, Verbal Scales

	Satisfaction vs Happiness	**Well-being vs Satisfaction**	**Well-being vs Happiness**
Male	chi2(26) 37.62 (0.0656)	chi2(26) 57.74 (0.0003)	chi2(26) 50.47 (0.0028)

33 Statistically significant differences between gender are found for free time satisfaction in satisfaction model :$\chi 2$ is 7.90 (0.0049); health satisfaction in happiness models: $\chi 2$ is 6.33 (0.0188); free time satisfaction in well-being models: $\chi 2$ is 6.01 (0.0142)

Table 10 A. Hausman test: equality of cutpoints coefficients models by gender, Verbal Scales

	Satisfaction vs Happiness	Well-being vs Satisfaction	Well-being vs Happiness
Male	chi2(6) 18.78 (0.0046)	chi2(26) 14.71 (0.0226)	chi2(26) 42.21 (0.0000)

Note: Prob > chi2 in parenthesis

Table 11. Hausman test: equality of regression coefficients models by gender, Verbal Scales

	Satisfaction vs Happiness	Well-being vs Satisfaction	Well-being vs Happiness
Female	chi2(26) 42.37 (0.00225)	chi2(26) 55.84 (0.0006)	chi2(26) 50.19 (0.0030)

Note: Prob > chi2 in parenthesis

Table 11A. Hausman test: equality of cutpoints coefficients models by gender, Verbal Scales

	Satisfaction vs Happiness	Well-being vs Satisfaction	Well-being vs Happiness
Female	chi2(6) 21.10 (0.00018)	chi2(6) 25.16 (0.0003)	chi2(6) 45.52 (0.0010)

Note: Prob > chi2 in parenthesis

A possible interpretation is that persons in a demographic group share identical notions of happiness etc., while these notions differ among various groups. Different groups may have distinct expectations and aspiration levels and this can lead to different evaluations of happiness. Judgments and evaluations typically involve comparisons of outcomes and experiences to a reference point. Reference points might reasonably be assumed to be different over subjects, over groups, in different periods of a lifetime, and over culture. See for an application of framing effect in Kim, J. and Choi. (2012). [34]

In Tables 12 and 12 A, we present the results of the regressions aimed to compare the different scales, for the determinants of happiness, life satisfaction, and well-being. These results show that the type of scale clearly matters. However, a clear pattern does not emerge.

[34] Since the seminal work of Kahneman and Tversky (1979), the literature over reference points has grown enormously. Recent applications are Heyman et al. (2005), Backus .et al. (2017). In the literature of happiness, see for example Lykken, and Tellegen, (1996). Shane and Loewenstein, (1999) Kim and. Choi. (2012).

Table 12 Satisfaction and happiness, scales comparison, Oprobit

	Satisfaction Verbal		**Satisfaction Nume Neg**		**Happiness verbal**		**Happiness Num**	
Family Economic Satisfaction	0.2290***	(7.71)	0.2088***	(6.98)	0.2313***	(7.68)	0.2040***	(6.89)
Freedom	0.0749**	(3.15)	0.1334***	(5.55)	0.1180***	(4.89)	0.1252***	(5.25)
Trust	0.0687**	(2.70)	0.0789**	(3.08)	0.0598*	(2.33)	0.0902***	(3.55)
Optimism	0.1251	(1.69)	-0.0742	(-0.99)	0.0908	(1.21)	0.0506	(0.68)
Good social life	0.2240*	(2.30)	0.3546***	(3.63)	0.1725	(1.75)	0.2348*	(2.41)
Easy life	0.1882**	(2.63)	0.1809*	(2.52)	0.2338**	(3.23)	0.1193	(1.68)
Risk aversion	-0.2895**	(-2.75)	-0.3798***	(-3.58)	-0.1498	(-1.42)	0.0322	(0.31)
Risk aversion2	0.0433**	(2.85)	0.0568***	(3.69)	0.0215	(1.41)	-0.0042	(-0.28)
Security	0.1695***	(5.05)	0.2076***	(6.12)	0.1872***	(5.51)	0.1817***	(5.44)
Health satisfaction	0.1312***	(4.55)	0.1296***	(4.49)	0.1397***	(4.83)	0.1255***	(4.39)
Free time satisfaction	0.1056***	(3.74)	0.1368***	(4.81)	0.1036***	(3.63)	0.1344***	(4.77)
Male	0.0309	(0.44)	-0.0064	(-0.09)	-0.0093	(-0.13)	0.0092	(0.13)
Age	-0.0248	(-1.67)	-0.0078	(-0.53)	-0.0394**	(-2.62)	-0.0226	(-1.53)
Age2	0.0003	(1.87)	0.0001	(0.75)	0.0003*	(2.34)	0.0002	(1.21)
Unemployed	-0.4278***	(-3.46)	-0.5100***	(-4.11)	-0.5761***	(-4.60)	-0.3396**	(-2.75)
N. of children	0.1442	(1.48)	0.0282	(0.29)	0.2264*	(2.29)	0.0621	(0.64)
N. of children 2	-0.0294	(-1.11)	0.0197	(0.73)	-0.0320	(-1.20)	0.0236	(0.89)
Education	0.1618	(0.92)	-0.1304	(-0.74)	0.0544	(0.30)	0.0437	(0.25)
Education2	-0.0146	(-0.75)	0.0198	(1.01)	-0.0034	(-0.17)	-0.0061	(-0.32)
Fixed_part	0.3577***	(4.53)	0.3817***	(4.80)	0.3222***	(4.03)	0.3890***	(4.93)
Alessandria	-0.1551	(-1.79)	-0.3668***	(-4.23)	-0.3920***	(-4.49)	-0.3107***	(-3.62)
Cherasco	0.1550	(1.06)	0.1684	(1.13)	-0.1599	(-1.09)	-0.1921	(-1.35)
Manager	0.3394	(1.42)	-0.0776	(-0.33)	-0.2082	(-0.88)	0.3950	(1.68)
White Collar	0.1442	(1.43)	0.0736	(0.73)	0.1086	(1.07)	0.1254	(1.26)
Student	0.0084	(0.05)	0.2287	(1.33)	-0.1360	(-0.78)	-0.0726	(-0.43)
Retired	0.0496	(0.20)	0.2288	(0.91)	0.2718	(1.07)	0.2416	(0.97)
Other occupation	-0.0202	(-0.12)	0.1812	(1.06)	-0.1311	(-0.77)	0.1426	(0.84)
_cut1	0.8791	(1.62)	0.7112	(1.31)	-0.3180	(-0.56)	0.9945	(1.84)
_cut2	1.5882**	(2.95)	1.5008**	(2.78)	0.7093	(1.30)	1.7174**	(3.21)
_cut3	2.2776***	(4.23)	2.1235***	(3.92)	1.6141**	(2.97)	2.4687***	(4.60)
_cut4	2.9108***	(5.39)	2.8914***	(5.32)	2.5034***	(4.59)	3.4053***	(6.30)
_cut5	4.0275***	(7.39)	4.0187***	(7.32)	3.6490***	(6.64)	4.4985***	(8.25)
_cut6	5.5653***	(10.07)	5.4291***	(9.79)	5.3567***	(9.60)	5.7725***	(10.47)
	-590.88559		-624.52		-628.56135		-816.23376	
Observations	1047		1047		1044		1044	
Pseudo R^2	0.160		0.188		0.178		0.162	

Note: t statistics in parentheses

$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Table 12A: Wellbeing, Scales Comparison Oprobit

	Well-being Verbal		Well-being Num		Well-being verbal		Well-being Num Neg	
Economic Condition	0.2925***	(6.70)	0.4465***	(10.00)	0.2507***	(5.55)	0.1515***	(3.57)
Freedom	0.1231**	(3.28)	0.1473***	(3.98)	0.1166***	(3.40)	0.1592***	(4.86)
Trust	0.1072**	(2.77)	0.1846***	(4.83)	0.0595	(1.61)	0.0500	(1.42)
ottimist	0.2899*	(2.49)	-0.0762	(-0.67)	0.0251	(0.24)	0.2276*	(2.29)
Good social life	0.1088	(0.76)	0.1518	(1.07)	0.1838	(1.28)	0.2369	(1.72)
Easy life	0.2767*	(2.54)	0.1624	(1.53)	0.3021**	(2.89)	0.1308	(1.31)
Risk aversion	0.1016	(0.63)	-0.1141	(-0.72)	-0.1989	(-1.34)	-0.6306***	(-4.39)
Risk aversion2	-0.0081	(-0.34)	0.0153	(0.66)	0.0288	(1.35)	0.0822***	(4.00)
Security	0.2998***	(5.51)	0.1700**	(3.25)	0.2263***	(4.72)	0.1843***	(4.05)
Health satisfaction	0.1182**	(2.73)	0.2352***	(5.38)	0.0559	(1.35)	0.0578	(1.45)
Free time satisfaction	0.1562***	(3.65)	0.0211	(0.51)	0.1478***	(3.55)	0.0723	(1.82)
Male	-0.1233	(-1.17)	0.0243	(0.24)	-0.0278	(-0.27)	0.0337	(0.35)
Age	-0.0428	(-1.88)	-0.0403	(-1.80)	-0.0133	(-0.62)	-0.0111	(-0.54)
Age2	0.0003	(1.57)	0.0004	(1.73)	0.0001	(0.54)	0.0000	(0.02)
Unemployed	-0.3329	(-1.74)	-0.0866	(-0.46)	-0.5462**	(-3.17)	-0.1995	(-1.20)
N. of children	0.5081**	(3.20)	0.4867**	(3.12)	-0.1193	(-0.87)	0.1086	(0.84)
N. of children 2	-0.1247**	(-3.07)	-0.1070**	(-2.66)	0.0623	(1.58)	0.0205	(0.55)
Education	-0.2144	(-0.84)	-0.0422	(-0.17)	0.5781*	(2.19)	0.6287*	(2.50)
Education2	0.0345	(1.23)	-0.0021	(-0.08)	-0.0583*	(-1.97)	-0.0621*	(-2.21)
Fixed_part	0.1811	(1.43)	0.1854	(1.49)	0.3342**	(3.04)	0.0606	(0.58)
Alessandria	-0.4862***	(-3.74)	-0.3377**	(-2.67)	-0.5314***	(-4.24)	-0.1300	(-1.09)
Cherasco	-0.3114	(-1.33)	-0.2720	(-1.21)	0.7812***	(3.63)	-0.0449	(-0.24)
Manager	0.5449	(1.37)	0.2324	(0.63)	-0.0532	(-0.16)	0.5060	(1.64)
White Collar	0.2479	(1.60)	0.1637	(1.09)	0.1174	(0.80)	-0.3117*	(-2.26)
Student	0.3784	(1.44)	0.0051	(0.02)	0.6184*	(2.38)	-0.1011	(-0.42)
Retired	0.2875	(0.88)	0.4737	(1.46)	-0.1475	(-0.35)	-0.3286	(-0.80)
Other occupation	-0.0642	(-0.23)	0.1540	(0.57)	-0.1578	(-0.69)	0.0271	(0.12)
_cut1	0.9957	(1.24)	1.2407	(1.58)	1.3706	(1.66)	1.0345	(1.34)
_cut2	1.5606*	(1.97)	1.9496*	(2.51)	2.1043**	(2.59)	1.7850*	(2.32)
_cut3	2.7934***	(3.52)	2.7863***	(3.57)	3.1920***	(3.92)	2.1594**	(2.80)
_cut4	3.8786***	(4.85)	4.0786***	(5.17)	4.3069***	(5.24)	2.8702***	(3.71)
_cut5	4.8530***	(6.02)	5.2588***	(6.59)	5.3655***	(6.46)	3.8816***	(4.98)
_cut6	7.1676***	(8.58)	6.6774***	(8.26)	7.9297***	(9.24)	5.1466***	(6.55)
Observations	501		501		547		547	
Pseudo R^2	0.239		0.228		0.228		0.126	

Note : t statistics in parentheses $p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

As shown in Table 13, no significant differences were found in the results between self-reported happiness in the verbal scale and in the unipolar scale, while significant differences were observed for cut points (Table 13A). On the contrary, the difference in coefficients was significant when self-reported life satisfaction in the verbal

scale and in the unipolar with negative numbers were compared[35]. However, no significant difference was found across cut points coefficients. Finally, statistically different regression coefficients and cut points coefficients were found between self-reported well-being in the verbal scale and scale with negative numbers[36] and between well-being in the verbal scale and well-being in the unipolar scale[37].

Table 13. Hausman test: equality of regressors coefficients across models , Numerical Scales

Satisfaction Verbal vs Satisfaction Num Neg	Happiness verbal vs Happiness Num	Well-being verbal vs Well-being Num	Well-being verbal vs Well-being Num Neg
chi2(27) 41.61 (0.0359)	chi2(27) 29.41 (0.3415)	chi2(27) 79.32 (0.0000)	chi2(27) 75.71 (0.0000)

Note: Prob > chi2 in parenthesis

Table 13A. Hausman test: equality of cutpoints coefficients across models , Numerical Scales

Satisfaction Verbal vs Satisfaction Num Neg	Happiness verbal vs Happiness Num	Well-being verbal vs Well-being Num	Well-being verbal vs Well-being Num Neg
chi2(6) 6.42 (0.3777)	chi2(6) 26.95 (0.0001)	chi2(6) 40.39 (0.0000)	chi2(6) 84.60 (0.0000)

Note: Prob > chi2 in parenthesis

7. Conclusions

Previous happiness literature evaluated the distribution responses comparing different wordings and different scales using available national and international data.

However, given the available data, the previous literature does allow neither a direct comparison between the three broad concepts of well-being nor the standardization of scales. We do both these and this makes it more efficient to

35 Significant difference for single variables are found: living in the middle size town $\chi 2$ is 6.01 (0.0142) and optimism $\chi 2$ is 4.39 (0.002).

36 Statistically different coefficient for single variables are found: risk aversion $\chi 2$ is 6.30 (0.0121); living in a middle town $\chi 2$ is 8.93 (0.0028); living in a big town $\chi 2$ is 6.47 (0.0110);

being a student $\chi 2$ is 5.66 (0.0174); being a white collar $\chi 2$ is 6.19 (0.0128); being a white collar $\chi 2$ 3.93 (0.0474);

37 Statistically different coefficient for single variable is found only for optimism $\chi 2$ is 7.06 (0.0079)

disentangle *wording or scale effects* from other survey design. We do it by using an expressively designed survey that contains a battery of comparable questions and in which we use the same standardized scales across questions.

We regress three different concepts (and the same concept using different scales) using several economic, social, and psychological covariates adopted in most of the existing literature. We find that both wordings and scales clearly matter. In particular, empirical results are similar when running regressions on life satisfaction, happiness, and well-being, but several differences do emerge. We find that age exerts a significant effect on satisfaction and happiness, while living in a medium town exerts a negative and significant effect on happiness and well-being. Moreover, we find different results between genders, for example, having children increases happiness and well-being in women while it has no effect on males.

Overall, these results suggest that different groups might perceive well-being, satisfaction, and happiness in different ways. This may be due to shared values within a particular group or specific needs inside one group or sharing the same kind of life (men versus women, old versus young, student versus workers) (see for example N. Fuentes and M Rojas (2001)). The existence of different kinds of utilities, instant as well as remembered utility, has for sure a different impact on old or young people as affect and eudemonia can have a different impact on different groups of the population. As Diener (1995) reports, "No time of life is happier or unhappier but at different ages predictor of happiness can differ" (and Diener, 1995, p. 11)

(For example, satisfaction correlates with social relation and health but the level of correlation differs normally with age, with the characteristic of culture: collective or individualistic).

In this case, to use surveys data for specific policies on specific groups of the population, we need to be aware that predictors of happiness can be different. Several authors suggest (Kahneman and Krueger (2006), Helliwell et al. (2013)) to develop new surveys that add a battery of further questions on satisfaction.

As far as our results are concerned, we find that the coefficients of the determinants across different notions of welfare and across different scales never reverse the sign. This denotes that policy implications obtained analysing the three concepts of welfare and the three different scales are consistent.

We think that this work should be replicated in other contests (other countries). Given the importance that HE and SWB have assumed, it is essential to develop a more uniform way of asking well-being questions and more focused questions to understand the sources of well-being which can be culturally sensitive (hedonics or eudemonia). Deeper research in this area can overcome most of the methodological problems still present in the literature. Increased uniformity in language, questions asked, and in the scales used to measure variables can increase international comparability, improve the robustness of the results, and enhance public policy applicability toward the population in general as well as a particular subgroup of it. These of course, would be extremely useful for increasing the understanding of this research area.

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Appendix

Survey Questions-Variables construction

Economic satisfaction

Overall how satisfied /dissatisfied are you with your family economic condition using the scale 1-7, where 1 represent the lowest evaluation and 7 the highest

Health satisfaction

Overall how satisfied /dissatisfied are you with your health condition using the scale 1-7, where 1 represent the lowest evaluation and 7 the highest

Free-time satisfaction

Overall how satisfied /dissatisfied are you with your free time using the scale 1-7, where 1 represent the lowest evaluation and 7 the highest

Risk aversion

Do you consider yourself a person ready to risk using the scale 1-7, where 1 represent the total risk aversion , 4 means that you are indifferent and 7 means you are a risk lover.

Trust

How much do you trust people using the scale 1-7, where 1 means I do not trust people at all and 7 means I do really trust people a lot

Freedom

How much do you thing you can manage your life independently using the scale 1-7, where 1 means I should completely adapt to other people willingness and 7 I can run my life in a completely independent way

Security

Overall how do you feel secure in your life using the scale -3 +3

Some individual attitude has been observed using the following questions

Do you agree with the following sentences:

Optimism

I'm optimistic with the future

- I strongly agree
- I agree
- I disagree
- I strongly disagree

We defined optimistic person those who answered "I strongly agree" and "I agree"

Social life

I feel socially excluded

- I strongly agree
- I agree
- I disagree
- I strongly disagree

We defined individuals with good social life those who answered "I strongly disagree" and "I disagree"

Easy life

Do you have a complicate life?

- I strongly agree
- I agree
- I disagree
- I strongly disagree

We defined individuals with an easy life those who answered "I strongly disagree" and "I disagree"