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Income Comparisons and Non-Cognitive Skills

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Abstract

People gain utility from occupying a higher ranked position in the income distribution of the reference group. This paper investigates whether these gains depend on an individual's set of non-cognitive skills. Using the 2000-2008 waves of the German Socio-economic Panel dataset (SOEP), a subjective question on Life Satisfaction, and three different sets of non-cognitive skills indicators, we find significant and robust differences across skills groups. People who are more neurotic, extravert and have low external locus of control and low negative reciprocity are more sensitive to their individual position in the economic ladder. By contrast, the Life Satisfaction reaction to changes in economic status is significantly lower among individuals who score high (low) in negative (positive) reciprocity, and are at the bottom of the distribution of neuroticism, extraversion. The heterogeneity on the importance of income comparisons needs to be taken into account when, for example, introducing them into economic models, predicting individuals' behaviour, or making welfare judgments.

Keywords: Life satisfaction; income comparisons; personality traits.
JEL codes: D62; I31

1. Introduction

Individuals are rank sensitive: they care about how well they perform in comparison with the relevant others. In economics and other disciplines, there has been an important set of literature devoted to understanding how individuals are influenced by their reference group and who their reference group is. In economics, the distinction between absolute and relative formulations of utility has proven a useful concept to rationalize a large set of unexplained phenomena in a variety of fields, including asset pricing (Campbell and Cochrane, 1999, Abel, 2008), growth (Carroll at al., 2000), consumption behaviour (Fuhrer, 2000), and wealth inequality (Díaz et al., 2003). Advances at the theoretical level have been parallel to a new wave of empirical papers assessing the relative importance of relative effects for individuals' utility or welfare. Many of these empirical papers are based on the use of self-reported happiness or life satisfaction as a proxy for individual utility. The empirical evidence is clear: people gain utility from occupying a higher ranked position in the income distribution of the reference group (Brown et al., 2008; Clark et al., 2009a; Powdthavee, 2009; Boyce, 2010).

This paper examines whether the rank effect differs between individuals endowed with different sets of non-cognitive skills and finds a considerable heterogeneity on the importance of income comparisons. The paper uses the 2000-2008 waves of the German Socio-Economic Panel dataset (SOEP) and three different sets of non-cognitive skills. The non-cognitive skills measures used in this paper are (i) the Big Five Inventory (BFI), a widely accepted approach to conceptualizing personality; (ii) the degree of individuals' external Locus of Control, i.e., the extent to which respondents feel they are not in command of their life; and (iii) a measure on individual's positive and negative reciprocity, an important concept in social psychology capturing how individuals respond to other individuals' actions. In our analysis, the dependent variable is a subjective measure of life satisfaction, which can be regarded as a proxy for individual utility.

In economics, the use of explicit personality measures has increased over the last recent years. There is growing evidence on the relationships between personality and a variety of life outcomes, including health, criminal activity and economic success (for a survey, Almlund et al., 2011). Complementary work provides evidence that non-cognitive skills affect a wide range of labor market outcomes such as occupational choices (Ham et al., 2009), job search effort (Caliendo et al., 2010), employment (Mohanty, 2010, Uysal and Pohlmeier, 2011) and, especially, earnings (Groves, 2005, Nyhus and Pons, 2005, Mueller and Plug, 2006, Semykina and Linz, 2007, and Heineck and Anger, 2010). These effects have led researchers to argue that personality should be given greater consideration in economics (Borghans et al., 2008).

Although the role of personality in shaping individual sensitiveness to income comparisons has never been examined using subjective satisfaction questions, the happiness literature does argue that individuals' personality is the most important component of individual heterogeneity in SWB equations (Boyce, 2010). Consistent with this view, researchers in the field have acknowledged the importance of controlling for this individual heterogeneity when estimating life satisfaction equations (Ferrer-i-Carbonell and Frijters, 2004). In addition, we have some evidence pointing at the relevance of personality on defining the importance of income for life satisfaction (Boyce and Wood, 2011, Proto and Rustichini, 2011) and on the role of personality on determining individuals' capacity to adapt to certain life events such as unemployment (Boyce et al., 2010b).

This paper forms part of the emerging interest on personality data by providing empirical evidence on the importance of non-cognitive skills in forming individuals' sensitiveness to others' income. The empirical results reveal a significant heterogeneity on the importance of income comparisons for individuals' satisfaction. This is, the effect on life satisfaction of the rank (position) that individuals occupy within the income distribution of their reference group varies largely across personality groups. While for some personality profiles income rank plays an important role on determining happiness (its coefficient in a happiness equation is statistically significant), for others income rank displays no statistical significance. For example, while individuals in the top of the neuroticism distribution are rank sensitive, those at the average or bottom of the distribution have a non-statistical coefficient for income rank. Of all the differences we find, three personality traits survive the test of statistically significant differences across its distribution. For this three personality traits we can safely conclude that they are relevant characteristics in shaping individuals' preferences over income rank. In contrast, differences over the other five personality traits do not survive this test of statistical significance. In a nutshell, these results show that: people are more sensitive to income comparisons when ranking high on extraversion and when at the bottom of the distribution of negative reciprocity and external locus of control. These differences across individuals should be taken into account when, for example, predicting individuals' behaviour, making welfare judgments, or introducing this type of externalities into economic models.

The paper is organized as follows: Section 2 discusses the literature; section 3 presents the data and the satisfaction and the non-cognitive skill measures used in this paper; section 4 outlines the empirical approach and hypothesis; section 5 presents the results; and section 6 concludes.

2. Previous literature

Income and consumption externalities have important implications for a variety of policy relevant issues at the micro and macro level, including optimal taxation, public redistribution, and the welfare costs of aggregate fluctuations (Frey and Stutzer, 2002; Di Tella et al., 2003; Senik, 2005; and Clark

et al., 2008a). In addition, these externalities are a part of individuals' welfare and preferences and thus influence human behaviour. Its understanding will therefore contribute to, for example, estimate the impact of policy changes on individuals' welfare or predict individuals' behavioural responses to changes in the markets.

The income rank hypothesis states that people gain utility from occupying a higher rank in the income distribution of their reference group. The empirical evidence using self-reported satisfaction data suggests that individuals are indeed rank sensitive. Clark et al. (2009a) match individual economic satisfaction scores from eight years (panel data) of the Danish European Community Household Panel (ECHP) with administrative data to calculate individuals' income and to estimate the income distribution of their neighbourhood. They find evidence that individual reported financial satisfaction positively depends on the income rank that the households occupy in the neighbourhood. Specifically, a 1-decile increase in the income rank is as important in terms of financial satisfaction as an income increase by a factor of almost 5. Based on Indonesian cross-section data from the year 2000, Powdthavee (2009) provides very similar estimates when using respondents' perception on own relative economic position as dependent variable. Brown et al. (2008) use cross-section data for the UK for 1998 and find evidence of a positive effect of a worker's rank within the workplace earnings distribution on self-reported satisfaction in different job related domains.

Previously to the above mentioned results, researchers using life-satisfaction questions as a proxy measure for utility empirically examined the relative income hypothesis by using the mean income level of the reference group rather than the rank. These studies found a negative (and statistically significant) effect of the reference group mean income on self-reported satisfaction (Blanchflower and Oswald, 2004; Ferrer-i-Carbonell, 2005; Luttmer, 2005; Senik, 2009). The robustness of this effect is remarkable except for few idiosyncratic exceptions. Senik (2004) finds a positive effect of the mean income of the reference group on happiness for Russia during the 1994-2000 transition period. Senik explanation for this finding is based on Hirschmann's tunnel effect (i.e., individuals' are less distressed by inequality if they can foresee that there will be an improvement in the next future). Senik argues that when living under large levels of economic uncertainty, individuals may interpret a high income of the reference group as a good signal about own future prospects. In short, during this period in Russia, the negative effect through comparison status may have been more than offset by the positive effect related to the information that higher incomes carry. A similar result is reported in Caporale et al. (2009) for Eastern European countries and in Clark et al. (2009b) for job (not life) satisfaction data when using co-workers as the comparisons group. In this later case, higher wages of work colleagues have a positive effect on job satisfaction if they are seen as a signal of good expectations about own wages in the future.

Boyce et al. (2010a) use data from the British Household Panel Survey to test for relative income effects using both, the average income of the reference group and the rank. These authors find evidence in favour of the income rank hypothesis.

The existing empirical estimates of the effect that income comparisons exert on life satisfaction have been calculated in an "average" sense, with the exception of two new working papers examining the life-cycle patterns of income comparisons (FitzRoy et al., 2011; and Akay and Martinsson, 2012).

This is the first paper to relax the assumption that individuals respond identically to societal information regardless of their personality. The happiness literature has shown that individuals' personality is the most important component of individual heterogeneity (Boyce, 2010) and researchers have acknowledged the importance of controlling for individual time persistent personality traits when estimating life satisfaction equations (Ferrer-i-Carbonell and Frijters, 2004). Nevertheless, up to date the only existing empirical evidence on the interplay between personality and social comparisons is based on field and laboratory experiments in psychology. In these papers however there is no direct test of the role of personality on shaping individuals' preferences, although they provide some indirect evidence. For example, this literature finds that the response to hedonically relevant information, including social comparisons, typically depends on specific personality traits such as self-esteem, optimism, neuroticism, and extraversion (Wheeler and Miyake, 1992, Aspinwall and Taylor, 1993). The extent and consequences of social comparisons is also found to differ between those individuals with a predisposition to be happy or unhappy. In general, individuals with a predisposition to be happy think more positively about themselves, feel more personal control, react more intensely to positive events and life outcomes, and show shorter drops in affect in response to unfavourable life events (Seidlitz et al., 1997, Lyubomirsky and Tucker, 1998). Comparison information appears to hurt unhappy individuals when it is unfavourable, but does not help them when it is favourable. Happy individuals instead do not appear to be hurt by unfavourable social information (Lyubomirsky and Ross, 1997, and Lyubomirsky et al., 2001).

This paper relies on economic data and on a large and representative sample to examine existing differences among individuals' endowed with different non-cognitive skills. In this paper we test the importance of non-cognitive skills on shaping how sensitive individuals are to their income rank. We expect that non-cognitive skills are relevant determinants of the importance that individuals give to the others when evaluating their own happiness level. This is, we postulate that non-cognitive skills shape individuals sensitiveness to outside information. For example, we expect that individuals who believe that the course of their life depends on themselves rather than on others, on luck or on social conditions, are more rank sensitive. In section 4.2 we outline our hypotheses.

3. Data and measurement

3.1 Data

This paper uses the German Socio-Economic Panel (SOEP), a wide-ranging representative longitudinal study of households running since 1984 that contains information on a broad set of personal, family and labour market characteristics of household members[i]. In 2005 the panel includes a set of questions aimed at capturing various measures of personality: a short version of the Big Five Inventory (BFI), a set of questions to assess the degree of external or internal Locus of Control (LOC), and several items to capture individuals' negative and positive reciprocity norms. Since these questions were only asked in 2005 and despite the fact that personality traits tend to be quite time consistent and that we correct for observable determinants of all these measures of personality (see section 3.2.1), the empirical analysis will focus on the years around 2005 only. In concrete we use years 2000 to 2008. After dropping observations with missing values in the relevant variables we retain 140,572 observations.

To test for the importance of relative income, we use a life satisfaction question as a proxy measure for utility. In the German SOEP, the life satisfaction question runs as follows:

How satisfied are you with your life, all things considered?

The answer to this question takes discrete values from 0 to 10 and hereafter will be referred to as Life Satisfaction (LS). Despite a long tradition among sociologist and psychologist, subjective data was subject to criticisms among some economists concerned about the potential biases arising from cultural differences, framing problems, cognitive bias, and mood effects. For reasons of space, the present paper overlooks such discussion by simply noting that the evidence accumulated over recent years has persuaded most readers and researchers about the validity and consistency of self-reported data. In a nutshell, subjective measures of satisfaction and well-being have a predictive power over relevant actions and are related (in the expected direction) to a number of objective indicators including physical health and longevity (Danner et al., 2001), suicide rates and macroeconomic fluctuations (Di Tella et al., 2003), unemployment (Clark et al., 2008b), and to measures of revealed preferences (Oswald and Wu, 2010). These measures also show a reasonable amount of internal consistency and temporal reliability: they correlate well with one another and with alternative methods of measurement, including ratings made by family and friends, facial measures of emotion and a vast array of psychological and psychosocial indicators (Cacioppo et al., 2008).

[i] For detailed information see Wagner at al., (2007) and Frick et al. (2007).

Table 1 contains the summary statistics of the sample. The average LS over the sample period is 6.96 (s.d. = 1.75). Satisfaction answers are skewed; individuals tend to be fairly happy with their lives, with almost 46% of the sample reporting a LS score above 7 and only 2% reporting below 3. Average monthly family income amounts to 2,932 euros. The average educational attainment is 12.1 years of schooling and the average age is 48.4 years. Women account for 52.1% of the sample. Most individuals are married or live with a partner (66.3%) and are employed (62.9%). In the regression stage, the continuous variables family income, age and age squared, years of completed education, number of children, and adults at home are entered in their logarithm form so as to take into account their decreasing marginal contribution to life satisfaction. The logarithmic relationship between income and life satisfaction is well documented. In order to consider heterogeneous household size and cost-of-life adjustments, all income-based variables in the paper are transformed using the OECD equivalence scale[ii] and normalized into real terms using the yearly consumer price index.

3.2 Non-cognitive skills

The questionnaire includes a short version of the Big Five Inventory (BFI) and a set of items related to Locus of Control (LOC) and to negative and positive reciprocity. The positive and negative reciprocity items relate to an important concept in social psychology aimed at measuring individuals negative and positive responses to other individuals' actions. The Big Five and the LOC measures are two alternative well known ways to describe individuals' personality. LOC aims at capturing the degree to which individuals believe that the course of their life is under their control or depends on external circumstances, such as luck or social conditions. The BFI is a well-accepted measure to describe the five major traits that define human personality across cultures (Costa and McCrae, 1992): openness, conscientiousness, extraversion; agreeableness, and neuroticism. Neuroticism is the tendency to experience negative emotions such as anxiety and depression; extraversion is the tendency to be sociable, warm, active, assertive, cheerful, and in search of stimulation; openness to experience is the tendency to be imaginative, creative, unconventional, emotionally and artistically sensitive; agreeableness reflects a dimension of interpersonal relations and is characterized by altruism, trust, modesty, and cooperativeness; and conscientiousness is the tendency to be organized, strong-willed, persistent, reliable, and a follower of rules and ethical principles.

The BFI questionnaire used in the German SOEP is based on 3 items for each personality dimension, which makes a total of 15 items. Despite psychologists typically work with longer questionnaires, the shortened version introduced in the German SOEP and used in this paper, known as the BFI-S, has

[ii] The OECD equivalized household size, E is defined as follows: let A be the number of household members who are older than 14, and let S be the household size, then $E = 1+0.7\times(A-1)+0.5(S-A)$.

been validated against longer inventories (Dehne and Schupp, 2007; and Lang et al., 2011). The 15 BFI-S items are:

I see myself as someone who: (i) worries a lot, (ii) gets nervous easily, (iii) is relaxed, handles stress well, (iv) is communicative, talkative, (v) is outgoing, sociable, (vi) is reserved, (vii) is original, comes up with new ideas, (viii) values artistic experiences, (ix) has an active imagination, (x) is sometimes somewhat rude to others, (xi) has a forgiving nature, (xii) is considerate and kind to others, (xiii) does a thorough job, (xiv) does things effectively and efficiently, and (xv) tends to be lazy.

The first three items aim at capturing neuroticism; the second set relate to extraversion, followed by openness to experience, agreeableness, and the last 3 items relate to conscientiousness. Respondents can cast their answers on a 1 to 7 scale, where 1 stands for "does not apply to me at all" and 7 for "applies to me perfectly". Some items are reversely scored, i.e., a higher score negatively correlates with the dimension under evaluation. The measure used in the regression analysis for each of the five personality traits is an average across the three items. Therefore the personality measures used in the empirical analysis can range from 1 to 7 as well. This is standard in the literature, as the BFI was designed so as to generate a single measure for each of the five different personality traits. An important issue in personality measures is the concern that variability in the resulting scores arise from measurement error. In our data, encompassing tests of internal consistency were satisfactory[iii].

Locus of Control (LOC) is a measure of the degree to which individuals feel the control of their life is on their own hands (internal) or depends on external factors (external). People with a high score in the items measuring external LOC believe that fate, luck, social conditions, or any other external circumstances are important determinants of the course of their lives; while those with a high score on internal LOC perceive that their life depend on own behaviour and efforts. The notion of LOC was developed by Julian Rotter and since then it has become an important concept to define personality within psychology. Lockwood (2002) found that the extent to which one finds social comparisons inspiring or threatening depends on whether one finds a sense of control over the dimension under evaluation. Therefore, we postulate that LOC will be a relevant personality trait on defining individuals' rank sensitiveness. In the SOEP data, LOC is surveyed with 10 items: the first four relate to internal LOC and the other six are aimed to measure external LOC. These are:

[iii] A principal component analysis with varimax rotation was conducted. Factor analyses clearly replicated the Big Five factors by yielding a correlation matrix with five eigenvalues above unity. The five principal components accounted for 60.7% of the total variance. The Cronbach's alphas for the five dimensions were 0.607, 0.657, 0.625, 0.505 and 0.609, respectively. It must be noticed that for a given level of internal consistency, fewer items per dimension result into lower alphas (Mueller and Plug, 2006). Hence, although these reliability coefficients are towards the lower range of admissible values, they point to a reasonable amount of internal consistency given the low (3) number of items per personality traits.

(i) My life course depends on me, (ii) influence on social conditions through involvement, (iii) success takes hard work, (iv) doubt my abilities when problems arise, (v) haven't achieved what I deserve, (vi) what you achieve depends on luck, (vii) others make the crucial decisions in my life, (viii) possibilities are defined by social conditions, (ix) abilities are more important than effort, (x) little control over my life.

Unfortunately, internal LOC was found to exhibit a very limited amount of construct validity in the data[iv], meaning that the surveyed items are not at all appropriate for measuring the underlying scale. This forced us to exclude internal LOC from the analyses and focus exclusively on external LOC, i.e. the last six items. The respondents are asked to answer each item on a 1 to 7 scale, where 1 stands for "disagree completely" and 7 for "agree completely". The measure used in the empirical analysis is also an average over the six items and can thus take values 1 to 7. A high score indicates that individuals have an external Locus of control. This is they feel that their life is largely driven by external factors such as luck and social conditions.

Our last measure of non-cognitive skills is reciprocity, which is computed by six items of which three refer to cooperative tendencies ("positive reciprocity") and the other three to retaliatory aspects ("negative reciprocity"). The positive reciprocity items are:

(i) if someone does me a favour, I am prepared to return it, (ii) I go out of my way to help somebody who has been kind to me before, (ii) I am ready to undergo personal costs to help somebody who helped me before.

The negative reciprocity items are:

(i) if I suffer a serious wrong, I will take revenge as soon as possible, no matter what the cost, (ii) if somebody puts me in a difficult position, I will do the same to him/her, and (iii) if somebody offends me, I will offend him/her back.

As in the other measures, the respondents can cast their response for each of these items on a 1 to 7 scale, where 1 stands for "does not apply to me at all" and 7 for "applies to me perfectly". The proxy measures used in the empirical analysis are the two averages over the three items. Despite the reduced number of items, the internal consistency of these two constructs is remarkably large[v].

[iv] The alpha reliability coefficient was as low as 0.201.

[v] The Cronbach's alphas for the two dimensions were 0.622 and 0.822, respectively. Auxiliary factor analysis supported the existence of two orthogonal factors, thus validating the a priori distinction between positive and negative reciprocity.

Table 2 shows the sample averages for each of the eight personality measures. In here we present the mean values, although in psychology an individual's personality is usually evaluated in terms of the percentile that the individual score occupies within the total distribution. For example, when taking a personality test, individuals are not informed about their score but about where their score stands in the distribution.

3.2.1 The stability of non-cognitive skills

The three different measures of personality (BFI, LOC and reciprocity) were gathered only in the 2005 wave of the German SOEP. To deal with this limitation, we relax the often imposed assumption that these constructs are constant over the period of analysis. We do that even though the time persistence of personality should not be seen as a stringent assumption, as it is generally accepted that adult's personality traits are fairly stable over time (Roberts and Del Vecchio, 2000, Costa and McCrae, 2002). Cobb-Clark and Schurer (2011) use the Income and Labour Dynamics in Australia (HILDA), where respondents were administered a version of the Big-Five Personality Inventory in waves 2005 and 2009, to examine whether the personality traits are stable among working-age adults. Their results, based on a large scale survey very similar to the SOEP, give strong support to this hypothesis.

In our sample, the respondents mean age is 48 years and on average they are interviewed during no more than 7 consecutive years, so that the potential interdependency between early life events and personality should not play much of a role. Still, some concerns may persist under the light of recent studies pointing to changes in personality traits over the life cycle and following changes in one's social and job environment. Aging is the most prominent factor put forward in those studies, with people steadily becoming more agreeable, conscientious and less neurotic over the life cycle (Roberts et al., 2006, Soto et al., 2011). Environmental factors and major life events, including marriage, divorce, widowhood, and transitions into an out of employment, may also affect personality (Kandler et al. 2012, Specht et al., 2011).

To address these concerns, in this paper we regress each personality trait on age and age squared, labour market status (employed, unemployed, reference: inactive) and marital condition (single, divorce, widowed, reference: married). The predicted residuals are free from this specific life events and, therefore, used as the relevant measures of personality. Expanding the set of regressors to include additional variables such as income, health and region or, alternatively, using the raw measures of personality lead to very similar results. In addition to using the predicted residuals, and given that personality measures were asked in 2005, the empirical analysis only uses the years 2000-2008 of the panel data.

4. Empirical approach

4.1. Definition of reference group

The literature on reference group formation is still in its infancy and it does not provide much empirical evidence or theoretical insights on how individuals form their reference group and what is the stability of those across time and domains. On one side, large-scale surveys do not contain direct questions about the composition of the reference groups and empirical results from pilot surveys or experimental evidence (see for example Clark and Senik, 2010) are not yet directly applicable to large questionnaires. The empirical literature has diverged on the operationalization and identification of the reference group, although the studies can be clustered into two: those assuming that comparisons take place among people living in the same geographical area; and those defending that individuals' reference group is formed by those who are similar to them (e.g., same age or socio-economic status). In the first group, we find a large variety in the level of aggregation, ranging from countries (Di Tella and MacCulloch, 2003), American states (Blanchflower and Oswald, 2004), Public Use Microdata Areas in the US (Luttmer, 2005) and census tract in Canada (Helliwell and Huang, 2010) to neighbourhoods (Clark et al., 2009a; Dittmann and Goebel, 2010) and Indonesian sub-districts (Powdthavee, 2009). Similarly, the variables defining the reference group in the second group of studies differ largely: while some authors consider that comparisons take place only between those in the same cohort (McBride, 2001), others include a larger set of variables (Senik, 2004; Ferrer-i-Carbonell, 2005), and others include those with similar wage determinants when it comes to satisfaction with the job (Brown at al., 2008; Clark et al., 2009b). Although there is some research on the endogeneity of the reference group formation (Falk and Knell, 2004; Senik, 2009; Clark and Senik, 2010), the evidence is still very scarce.

This paper follows a mixed approach by constructing reference groups taking into account some individual characteristics as well as introducing a geographical dimension into the analysis. In concrete, we generate reference groups by partitioning the sample into various groups using the geographical region where the household lives (West or East Germany), the gender of the respondent, the education attainment of the respondent (less than 10, 10-10.5, 11-11.5, 12 and more than 12 years of schooling), and the age of the respondent (younger than 25, 25-34, 35-44 and older than 65). The combination of these criteria produces 100 different groups. Although sensitive analysis showed that it did not affect our results, we dropped those individuals in a group with less than 10 observations in a given year. In total 144 observations were dropped from the sample.[vi]

While the reference group is defined at the individual level, the reference income is taken as the household income. Individuals are assumed to obtain information about the others through their own

[vi] In the final sample the average number of individuals in a group ranges from a minimum of 10 to a maximum of 1,086 at an average of 378.0 (s.d. = 237.52).

reference group, i.e., we assume that individuals generate information by looking at those similar to them. Nevertheless, since we examine the effect of rank and income on life satisfaction and we know that individuals generate enjoyment from their disposable income, we take household (and not personal) income as the relevant measure. This implies to assume that, at least to a large extent, there is income pooling at the household level.

In sum, individuals are assumed to compare themselves with (and thus to have information on) the household income level of individuals like them[vii]. Then, the rank that an individual occupies is given by the individual relative position within that specific cell.

4.2 Estimating procedure

Life Satisfaction (LS) is assumed to be a function of personal characteristics and circumstances,

$$LS = f(LS^*(X, y, r)) \qquad (1)$$

where X is a vector of socio-economic characteristics, y is household income and r is the individual normalized income rank. The rank is defined as the position of individual i in terms of his or her household income as a proportion of the number of individuals in group g. This is: $(P_{ig}-1)/(N_g-1)$, where P_{ig} is the position of individual i in group g, and N_g is the number of individuals in the group. Normalized rank is zero for the poorest individual in the group and one for the richest one.

We take reported LS to be cardinal. This is, we assume that the distance between the eleven satisfaction categories carry a meaning. It has been shown that assuming cardinality as oppose to regress satisfaction with ordinal models is rather irrelevant for the results in terms of trade-offs between explanatory variables (Ferrer-i-Carbonell and Frijters, 2004) while it has the advantage of yielding coefficients that can be directly interpreted as marginal effects. We rely on the Probit Adapted Ordinary Least Squares (POLS) as developed by Van Praag and Ferrer-i-Carbonell (2008, p. 29-34). As a robustness check, we have estimated the model with the standard linear fixed effect model and found very small differences in terms of trade-offs between variables and statistical significance. The POLS model has been applied in the happiness literature by Stevenson and Wolfers (2008 and 2009) and Boes, et al. (2007) among others. Implementing POLS begins by deriving $\{\mu_j\}_{j=0}^{J}$ values of a standard normal associated with the cumulative frequencies of the J different categories of the dependent variable, with $\mu_0 = -\infty, \mu_J = \infty$. Then the expectation of a standard normally distributed variable is taken for an interval between any two adjacent values. Thus if the true unobserved continuous variable for individual i at time t is LS_{it}^* where the observed is

[vii] Given the approximately normal distribution of log income, the cell mean can be regarded as the 'typical' income level in the group.

$LS_{it} = j \; if \; \mu_{j-1} < LS^{*}_{it} < \mu_j$ for j=1,..., J, then the conditional expectation of the latent variable is given by:

$$L\ddot{S}_{it} = E(LS^{*}_{it} \mid \mu_{j-1} < LS^{*}_{it} < \mu_j) = \frac{n(\mu_{j-1}) - n(\mu_j)}{N(\mu_j) - N(\mu_{j-1})} \qquad (2)$$

where n is the normal density and N is the cumulative normal distribution.[viii] This approach allows the inclusion of individual fixed effects and the application of a linear estimator on the conditional expectations, which is assumed to be a function of observable characteristics

$$L\ddot{S}_{it} = \alpha X_{it} + \beta y_{it} + \gamma r_{it} + v_i + \varepsilon_{it} \qquad (3)$$

where X includes age and age squared, years of completed education, household size (number of children and number of adults at home), and a set of dummy variables for gender, marital condition, employment status, immigrant condition, and health status. Year fixed effects and controls for the 16 German federal states are included as additional explanatory variables. The term v_i represents the individual fixed effect and ε_{it} an iid error term.

In this paper we hypothesize that the effect that rank r has on satisfaction (i.e., γ) depends on the individual personality trait p.

Since we assume that each personality facet p is constant across time (see section 3.2.1), a fixed effect model does not allow for an exploration of these effects by simply including the score in personality p and an interaction term between p and r in the estimation of equation (3). In other words, since personality is constant across time, it cannot be included in a fixed effects model. Although a way to estimate equation (3) would be using a random effects model, we choose for an alternative approach as we cannot safely assume orthogonality between the individual random effect and the explanatory variables. This is, we cannot assume that there is no correlation between, for example, intelligence or optimism and education or income. Instead, we propose an empirical approach that allows us to estimate the life satisfaction model with individual fixed effects and that, at the same time, is consistent with the usual approach in psychology of assessing an individual's personality not by the score but by the percentile that the score occupies within the total distribution. In concrete, we run a fixed effect model for various sub-samples of individuals defined according to

[viii] The stata routine used in the paper is available upon request.

the percentile they occupy in the personality distribution. This is, for each personality trait *p* we divide the sample into four groups defined by the quartiles of the corresponding personality score. An individual with score *x* in personality *p* is in the *q*-th quarter of the distribution if $x_{0.25\cdot(q-1)} < x \leq x_{0.25\cdot q}$, for *q* = 1, 2, 3 and 4, where x_c is the *c* percentile of the distribution, $P(x \leq x_c) = c$, with $-\infty = x_0 < x_c \ldots < x_1 = \infty$.

Then, for each of the 8 personality traits considered in the paper we run three separate regressions: one for individuals in the 1st quarter (top 25% of the distribution), one for individuals who are either in the 2nd or 3rd quarter, and one for those in the 4th quarter of the distribution (bottom 25% of the distribution). This is:

$$LS_{it}^{pj} = \alpha^{pj} X_{it}^{pj} + \beta^{pj} y_{it}^{pj} + \gamma^{pj} r_{it}^{pj} + v_i^{pj} + \varepsilon_{it}^{pj} \qquad (4)$$

with *j* =1, 2-3 and 4, where γ^{pj} is the impact of rank upon *LS* among individuals who belong to the *j*-th quarter of the distribution of personality trait *p*.

5. Results: the effect of rank and the role of the non-cognitive skills

Table 3 reports the estimates corresponding to the total sample and to the different personality subsamples. The results are supportive of the prominent role of some personality features as a mediating force on the importance of relative income for life satisfaction. In other words, the results show heterogeneity on the effect that comparison income has on happiness or life satisfaction. While some individuals tend to be rank insensitive (e.g., non-extraverts or individuals at the top of the external LOC distribution) others are much affected by their position on the income distribution (e.g., individuals scoring low on external locus of control or negative reciprocity).

Our results show that the partition of the sample according to personality also yields some heterogeneity through income: the marginal utility of income differs across personalities. These differences however are smaller than the ones for the rank coefficient. Boyce and Wood (2011) also found differences on the marginal utility of income depending on the individual personality, although our results are not identical to theirs. The dissimilarities may be driven by two main differences between the two papers: (i) we use a larger set of personality measures, and (ii) Boyce and Wood (2011) do not estimate separate regressions for each subsample but chose to estimate the model with interactions. To do that, they assume that the effect of each personality measure on life satisfaction is already captured by the individual fixed effect (see section 4.2).

The coefficients of the other variables are, except for singlehood, similar across samples. In all samples, LS depends negatively on the number of adults at home, widowhood, and unemployment; and depends positively on the number of children, being in employment, and being divorced. The relationship between age and LS is u-shaped, with a minimum at about 41 years, whereas schooling is not significantly related to LS. Although singlehood is negative for most sub-samples, it is not statistically significant among those ranking high in neuroticism, agreeableness, and external LOC; and ranking low in openness, and negative reciprocity.

On average (i.e., for the total sample) the effect of rank income on life satisfaction amounts to 0.062 (first column of Table 3) and it is significant at the 1% level The results in Table 3 show, that while for some personality profiles income rank has a positive and statistically significant effect on life satisfaction, for others income rank displays no statistical significance. For example, while individuals in the top of the neuroticism distribution are rank sensitive, those at the average or bottom of the distribution have a non-statistical coefficient for income rank. Similarly, only individuals at the average distribution of conscientiousness have a statistically significant income rank coefficient.

Using the results in Table 3 we test, for each personality trait, whether the differences of the rank coefficient and the rank-income tradeoff between individuals in different quartiles of the personality distribution are statistically significant. The test is based on a cluster robust variance estimator that combines the covariance matrices obtained in the estimations of the different subsamples. The results are reported in Table 4. The figures reported correspond to the $\chi 2$ statistic and the associated p-value.

Although the results are suggestive of homogenous rank effects within several personality groups (neuroticism, openness, agreeableness, conscientiousness, and positive reciprocity), for extraversion, external LOC, and negative reciprocity the hypothesis that the impact of rank upon life satisfaction is constant across the personality distribution is rejected. Differences between individuals in the top and bottom quartiles of the extraversion, external LOC and negative reciprocity distribution are statistically significant. The statistics also lead to rejection of the null hypothesis when individuals in the intermediate quartiles of the distribution are compared with those in the top (extraversion, external LOC) and bottom quartiles (negative reciprocity).

Using the results in Table 3, we can also calculate the trade-off between income and rank. For the total sample, we find that individuals would need a compensation of about 55% of their current income to move from the top (rank = 1) to the bottom (rank = 0) of the income distribution of their

reference group: i.e., [exp(0.062/0.142)-1]x100 = 54.7%[ix]. This trade-off becomes much larger (or smaller) when we separate individuals according to their personality. For example, for someone with low external LOC (someone who does not think that external circumstances have a major role in determining the course of own life) the needed compensation is not 55 but 391% of their current income. Table 5 summarizes the equivalence scales between household income and a 1-decile increase in rank for the different personality groups. The second row transforms this equivalence into euros per month using the sample average household income within the group. In addition, Table 5 includes, for all these estimates, the 95% confidence interval[x]. In the total sample, the effect of a 1-decile increase in rank is as important in terms of life satisfaction as a 4.5% increase in household income. For the sample average household income, this variation amounts to €131.7 a month. This trade-off more than triplicates for individuals at the bottom of the distribution of external LOC (17.2%, €435) and at the top of extraversion (18.2%, €556.4), and it is almost three times as big for those with low negative reciprocity (12.5%, €354.0). The importance of rank for life satisfaction is also well above the average for those scoring high in neuroticism (10.5%, €286.4) and scoring at the average of conscientiousness (5.68%, €161.4) and external LOC (6.08%, €153.3). In all these cases, the rank-income trade-off is statistically significant, as suggested by the confidence intervals reported in Table 5. In contrast, rank appears to be largely insignificant in explaining LS among a number of groups, for example, those at the bottom and average of the distribution of neuroticism and extraversion; those at the top and average of the distribution of negative reciprocity, those with either high or low conscientiousness, and those at the top of external LOC. In all these cases the rank income trade-off is not statistically different from zero.

An important question that arises is whether our findings on the importance of rank across personality profiles are in line with laboratory research in the field of psychology. We find common ground for conscientiousness, neuroticism and external LOC, although our results for the two first personality traits are not statistically significant. There are results in the literature showing that conscientious individuals tend to value wealth accumulation (Ameriks et al., 2003), set themselves higher goals and care more about achieving them (Barrick et al., 1993; DeNeve and Cooper, 1998). It is likely that such a predisposition enlarges the importance of income comparisons. This may partially explain the results in our data, where individuals at the bottom of the conscientiousness distribution are rank insensitive, while this is not true for those at the average. As for neuroticism, it is linked to higher sensitivity to negative emotions like anger, hostility or depression (Clark and Watson, 2008), and modern studies identify this personality trait with sensibility to negative outcomes, threats and

[ix] This is $[\exp(\gamma^{pj}/\beta^{pj} * \Delta r) - 1] * 100$, in which "-1" and "*100" are added so as to obtain the result in percentage terms.

[x] The equivalent income measure is a ratio of two distinct covariates. Therefore, we need to take into account the standard deviation of such a ratio in order to compute the confidence interval. This is done by using the "nonlinear combinations of estimators" option in STATA, which yields first and second moments of nonlinear combinations of the different covariates.

punishments (see DeYoung et al., 2010, for a survey). Neurotic people respond more sensitively to social comparisons, regardless whether they are downwards or upwards (Van der Zee et al., 1998), and individuals with low self-esteem, a related aspect of neuroticism, are more sensitive to comparisons both improving more their mood after comparing with worse-off others and responding more negatively after comparing with better-off others (Wheeler and Miyake, 1992; Aspinwall and Taylor, 1993). The results in this paper suggest that to a large extent these views can be expanded to the realm of income comparisons, as individuals at the top of the neuroticism distribution are statistically significantly affected by the rank they occupy, while the ones at the average and bottom of the distribution are not. Finally, the extent to which one finds social comparisons inspiring or threatening is known in the field of psychology to depend on whether one finds a sense of control over the dimension under evaluation. The results, based on economic data, support this intuition. Individuals with low external LOC believe that their behaviour is guided by their personal decisions and efforts and not that much by external circumstances, such as luck and social conditions. Thus, they reap more emotional benefits from an advantageous position (Wood and Van der Zee, 1997). Interestingly, we find indeed that this group is particularly sensitive to rank variations, probably because they are more prone to blame and credit themselves for their economic status.

The available evidence for reciprocity is very scarce. Fehr and Gächter (2000) argue that positive reciprocity has powerful implications for many economic domains, including the enforcement of explicit social norms; and Dohmen et al. (2009) find that being positively reciprocal predicts higher work effort. Nevertheless, we find no important variations on the rank sensitiveness across the distribution of positive reciprocity. Nevertheless, we do find important rank differences across the distribution of negative reciprocity: individuals at the bottom of the distribution are more rank sensitive.

6. Conclusions

This paper uses economic data from a large scale survey to document the importance of non-cognitive skills on the importance of income rank for individual satisfaction. Previous research in psychology, confined to laboratory studies, pointed to important personality effects in the response to social comparisons. The results of this paper, based on fixed effects estimates from the 2000-2008 waves of the German Socio-economic Panel and three different sets of non-cognitive skills measures, are suggestive of relevant differences across groups. We have found consistent evidence that the importance of income rank for individuals' reported life satisfaction varies significantly across individuals endowed with different sets of non-cognitive skills. Individuals at the top of the extraversion distribution are more rank sensitive and so are those at the bottom of the distribution of external locus of control and negative reciprocity.

A first implication of our findings regards the design of economic models. In word of Clark et al. (2008a) "taking relative income seriously is an important step toward greater behavioral realism in Economics, such that our models and empirical analysis move closer to how real people feel and behave". At the theoretical level, the distinction between absolute and relative formulations of utility has proven a useful concept to rationalize a large set of unexplained phenomena in a variety of fields, including consumption, savings, growth and financial regularities. Acknowledging the extent of individual heterogeneity surrounding relative effects would prove fruitful to bring closer the theory to data and, most probably, to account for yet unexplained phenomena.

As a second implication, welfare analysis should take into account the diverging importance of income externalities, for example, when designing optimal income taxation or defining poverty. The poverty literature has explicitly argued that relative concerns matter for individuals and some researchers have consequently defended that we should base the poverty line on relative rather than absolute consumption. Although in practice taking personality differences into account for relative poverty measures would be very difficult, our results warn that imposing a common benchmark might be seriously misleading. This concern also applies to the welfare analysis of deprivation and social exclusion promoted within the Europe 2020 Strategy.

Finally, and to the extent that individuals behave so as to improve their life satisfaction (Heffetz et al., 2012), the importance of income rank for individuals' satisfaction will partly drive individuals' behaviour in several life domains. Therefore, understanding the heterogeneity of preferences over relative income will help us to understand individuals' behaviour in the markets. For example, status motives are an important determinant of labour supply and of amount of effort at work (Neumark and Postlewaite, 1998). Our results suggest that individuals endowed with different set of non-cognitive skills may respond very differently to relative income concerns. A next natural step would be to test these hypotheses using labour market data.

This paper contributes to the literature by corroborating the importance of income comparisons in Germany and by identifying an important source of heterogeneity. Our estimates identify certain personality profiles that tend to be more concerned with others and more responsive to the social context and in concrete to income rank. These individuals will be much less responsive to general economic growth if equally distributed but they may be more responsive to job environments. Our next step would be to identify whether this personality profiles also shape individuals' preferences regarding the income distribution or inequality in the region. Earlier findings in the literature show that some personality profiles are correlated with larger happiness reports (Boyce, 2010) and that personality also shapes the marginal utility of income (Boyce and Wood, 2011). Our results are consistent with these findings. We however see no important personality differences in the effect of

other individual socio-economic or demographic characteristics on life satisfaction. It seems therefore that personality plays a role on shaping individual life satisfaction and preferences only through some channels and for certain personality profiles. It is interesting to notice that from the Big Five personality model, only extraversion is a relevant dimension to define individuals' sensitiveness to others' income and achievements. Locus of control (the extent to which individuals feel they are in control of things) and reciprocity are instead an important determinant of this. Understanding the relationship between income comparisons, satisfaction, and personality identifies an important dimension in defining the heterogeneity in individuals' sensitiveness and therefore reactions to others' income.

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Tables and figures

Table 1. Summary statistics – Socioeconomic characteristics

	Mean	SD
Life satisfaction	6.960	1.752
Household income	2931.900	2060.290
Age	48.380	16.260
Woman	0.521	0.500
Years education	12.098	2.666
No. of adults	2.179	0.841
No. of children	0.539	0.904
Employed	0.629	0.483
Unemployed	0.073	0.259
Inactive	0.299	0.458
Married	0.663	0.473
Single	0.205	0.404
Divorced	0.072	0.258
Widow	0.061	0.239
Badhealth	0.166	0.372
East Germany	0.257	0.437
Foreigner	0.116	0.320

Table 2. Summary statistics – Personality traits

	Mean	SD
Neuroticism	3.967	1.218
Extraversion	4.829	1.130
Openness	4.496	1.200
Agreeableness	5.459	0.973
Conscientiousness	5.936	0.910
External LOC	3.545	0.878
Positive reciprocity	5.883	0.909
Negative reciprocity	3.087	1.451

Table 3. Rank and personality, FE – German SOEP 2000-2008

	TOTAL SAMPLE		Neuroticism						Extraversion					
			Top 25%		Average		Bottom 25%		Top 25%		Average		Bottom 25%	
	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio
Ln (income)	0.142 ***	10.44	0.117 ***	4.05	0.149 ***	7.84	0.145 ***	5.32	0.102 ***	3.68	0.164 ***	8.72	0.121 ***	4.27
Rank	0.062 ***	2.81	0.117 ***	2.46	0.039	1.25	0.054	1.22	0.171 ***	3.72	0.025	0.82	0.038	0.83
R-squared	0.013		0.011		0.017		0.025		0.106		0.010		0.000	
No. of observations	140179		35048		70083		35048		35103		70031		35045	

	Openness						Agreeableness						Conscientiousness					
	Top 25%		Average		Bottom 25%		Top 25%		Average		Bottom 25%		Top 25%		Average		Bottom 25%	
	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio
Ln (income)	0.131 ***	4.96	0.157 ***	8.36	0.118 ***	3.99	0.163 ***	5.87	0.135 ***	7.18	0.145 ***	5.17	0.152 ***	5.38	0.136 ***	7.03	0.141 ***	5.28
Rank	0.061	1.35	0.048	1.57	0.090 *	1.93	0.078 *	1.69	0.038	1.24	0.083 **	1.85	0.059	1.27	0.075 **	2.39	0.025	0.57
R-squared	0.017		0.012		0.005		0.011		0.020		0.013		0.014		0.056		0.001	
No. of observations	35193		69939		35047		35091		69969		35119		35051		70072		35056	

	External LOC						Positive reciprocity						Negative reciprocity					
	Top 25%		Average		Bottom 25%		Top 25%		Average		Bottom 25%		Top 25%		Average		Bottom 25%	
	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio
Ln (income)	0.247 ***	8.34	0.133 ***	6.80	0.066 ***	2.58	0.131 ***	4.80	0.141 ***	7.35	0.156 ***	5.55	0.174 ***	6.14	0.132 ***	7.04	0.117 ***	4.19
Rank	-0.027	-0.57	0.078 ***	2.47	0.105 **	2.43	0.088 *	1.94	0.052 *	1.66	0.052	1.15	0.067	1.48	0.030	0.96	0.138 ***	2.97
R-squared	0.097		0.004		0.018		0.011		0.079		0.000		0.005		0.034		0.008	
No. of observations	35105		69949		35125		35078		70019		35082		35108		69954		35117	

Notes to Table 3: i) * denotes significance at the 10% level, ** denotes significance at the 5% level, *** denotes significance at the 1% level; ii) The results are controlling for age and age squared, years of completed education, household size (number of children and number of adults at home) and additional dummy variables for marital condition, employment status and health condition. Year fixed effects and controls for the 16 German federal states are included as additional regressors.

Table 4. Testing differences between personality groups.

	Top 25% vs. bottom 25%		Top 25% vs. 75%-25%		75%-25% vs. bottom 25%	
	Rank	Rank-income tradeoff	Rank	Rank-income tradeoff	Rank	Rank-income tradeoff
Neuroticism						
χ2 statistic	2.49	0.78	1.80	1.26	0.24	0.07
p-value	0.11	0.38	0.18	0.26	0.63	0.79
Extraversion						
χ2 statistic	6.26 ***	4.03 **	5.85 ***	4.99 **	0.21	0.11
p-value	0.01	0.04	0.02	0.03	0.64	0.74
Openness						
χ2 statistic	0.15	0.18	0.01	0.11	0.27	0.58
p-value	0.70	0.67	0.93	0.74	0.60	0.44
Agreebleness						
χ2 statistic	2.15	0.58	0.35	0.26	1.39	0.41
p-value	0.14	0.45	0.55	0.61	0.24	0.52
Consciousness						
χ2 statistic	0.10	0.18	0.02	0.12	0.28	0.68
p-value	0.75	0.67	0.88	0.73	0.59	0.41
External LOC						
χ2 statistic	7.02 ***	3.97 **	6.95 ***	4.66 **	0.08	0.69
p-value	0.01	0.05	0.01	0.03	0.78	0.41
Positive reciprocity						
χ2 statistic	0.39	0.34	0.37	0.33	0.01	0.01
p-value	0.53	0.56	0.54	0.57	0.91	0.94
Negative reciprocity						
χ2 statistic	3.87 **	3.12	0.00	0.17	5.51	3.79
p-value	0.05	0.10 *	0.96	0.68	0.02 **	0.05 *

Notes to 4: i) * denotes significance at the 10% level, ** denotes significance at the 5% level, *** denotes significance at the 1% level;

Table 5. The rank-household income equivalence scale, by personality groups

	Total sample:		
	4.49 % *** [1.32 % ; 7.75 %]		
	131.7 € [38.7 € ; 227.5 €]		
	Top 25%	Average	Bottom 25%
Neuroticism	10.51 % *** [2.06 % ; 19.67 %]	2.64 % [-1.46 % ; 6.91 %]	3.80 % [-2.24 % ; 10.22 %]
	286.4 € [56.1 € ; 535.7 €]	76.7 € [-42.3 € ; 200.7 €]	121.8 € [-72.0 € ; 327.6 €]
Extraversion	18.21 % *** [8.24 % ; 29.11 %]	1.56 % [-2.12 % ; 5.38 %]	3.16 % [-4.16 % ; 11.04 %]
	556.4 € [251.6 € ; 889.4 €]	47.6 € [-64.8 € ; 164.3 €]	96.7 € [-127.0 € ; 337.4 €]
Openness	4.78 % [-2.08 % ; 12.13 %]	3.12 % * [-0.76 % ; 7.14 %]	7.90 % * [-0.11 % ; 16.55 %]
	152.4 € [-66.4 € ; 386.5 €]	99.3 € [-24.1 € ; 227.5 €]	251.6 € [-3.5 € ; 527.1 €]
Agreeableness	4.92 % * [-0.76 % ; 10.92 %]	2.88 % [-1.64 % ; 7.61 %]	5.86 % [-0.34 % ; 12.44 %]
	135.9 € [-21.0 € ; 301.8 €]	79.7 € [-45.3 € ; 210.5 €]	162.0 € [-9.3 € ; 343.9 €]
Conscientiousness	3.99 % [-2.09 % ; 10.44 %]	5.68 % ** [1.00 % ; 10.57 %]	1.81 % [-4.23 % ; 8.23 %]
	113.4 € [-59.4 € ; 296.9 €]	161.4 € [28.5 € ; 300.5 €]	51.4 € [-120.2 € ; 233.9 €]
External LOC	-1.08 % [-4.71 % ; 2.69 %]	6.08 % ** [1.23 % ; 11.16 %]	17.24 % *** [3.09 % ; 33.33 %]
	-27.2 € [-118.7 € ; 67.9 €]	153.3 € [30.9 € ; 281.6 €]	435.0 € [78.0 € ; 841.0 €]
Positive reciprocity	7.00 % * [-0.07 % ; 14.58 %]	3.74 % [-0.67 % ; 8.34 %]	3.40 % [-2.35 % ; 9.49 %]
	200.8 € [-2.1 € ; 418.1 €]	107.2 € [-19.3 € ; 239.2 €]	97.6 € [-67.2 € ; 272.1 €]
Negative reciprocity	3.93 % [-1.24 % ; 9.37 %]	2.25 % [-2.32 % ; 7.04 %]	12.50 % *** [4.08 % ; 21.61 %]
	111.3 € [-35.1 € ; 265.3 €]	63.8 € [-65.6 € ; 199.3 €]	354.0 € [115.4 € ; 611.9 €]

Note to Table 5: i) * denotes significance at the 10% level, ** denotes significance at the 5% level, *** denotes significance at the 1% level;

Figure 1.Distribution of personality traits