Personality and the marginal utility of income: Personality interacts with increases in household income to determine life satisfaction

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Abstract

Economics implicitly assumes that the marginal utility of income is independent of an individual's personality. We show that this is wrong. This is the first demonstration that there are strong personality-income interactions. In an analysis of 13615 individuals over 4-years we show that individuals who have high levels of conscientiousness obtain more satisfaction to their lives from increases to their household income. There are strong gender differences and women that are open-to-experiences, introverted or neurotic get lower satisfaction from household income increases. Our findings have important implications for the use of financial incentives to influence behavior. In the future, public policy may benefit from being personality-specific.

1. Introduction

Will more money improve an individual's satisfaction with life, and if so, by how much? The use of subjective well-being data has helped researchers evaluate the role of income in an individual's life. For example, it has been shown that there are large well-being differences between low and high income earners (Lucas & Schimmack, 2009) and that an exogenous increase to an individual's income can raise their well-being (Frijters et al., 2004, Gardner & Oswald, 2007). Researchers have also shown that individuals are mainly concerned with how their income compares with others (Boyce et al. 2010, Ferrer-i-Carbonell, 2005, Luttmer, 2005) and that this comparison process is thought to explain why economic growth in developed countries has not always increased national well-being (Blanchflower & Oswald, 2004, Easterlin, 1995).

The literature on income and well-being is extensive (Clark et al., 2008b, Howell & Howell, 2008) but the relationship is far from fully understood. Current research into income and well-being almost always focuses on average effects across a sample (for example, Layard et al. (2008) estimate the average elasticity of income across various samples). Researchers have shown, however, that the benefit from income can vary according to an individual's health (Finkelstein et al., 2008, Smith et al., 2005). It seems likely that individuals will have heterogeneous preferences (Barsky et al., 1997), yet very little is known about how the marginal utility of income might vary across a population. How an individual spends their money can be important for well-being and research has shown, for example, that engaging in pro-social spending has a strong positive effect on well-being (Dunn et al., 2008). Such a finding could indicate that individuals with particular types of preferences could extract more utility from a given income increase. Some researchers have suggested

that the role of emotions are hugely understated in economic theory, even though emotions are likely to influence an individual's enjoyment of particular economic activities (Elster, 1998, Loewenstein, 2000). The habitual experience of emotions is closely linked to an individual's personality (Revelle & Scherer, 2008), hence, it is likely that an individual's marginal utility of income could be dependent upon their personality.

Personality measures are used extensively in psychology (Pervin & John, 1999) and self-reported personality judgments have impressive levels of reliability and validity. For example, self-reported personality traits are highly stable over time (McCrae & Costa, 1990), are related to peer ratings (McCrae & Costa, 1987), predict objective behavior (Epstein, 1979) and occupational success (Hogan, 2005), have biological correlates (Ryff et al., 2006), and prospectively predict changes in objective biological functioning over time (O'Cleirigh et al., 2007). Such findings have led to personality psychology being studied and applied in many contexts, including health, clinical, psychiatric, educational, and occupational settings.

The measurement of personality enables a categorization of people and their behaviors but, mostly due to a lack of familiarity, such measures have not yet been fully integrated into economic research (Borghans et al., 2008). In relation to well-being research, it is fairly clear that personality is one of the biggest and most consistent predictors of well-being (Diener & Lucas, 1999). Some authors estimate that between 44% and 52% of the variation in well-being is attributable to individual differences (Lykken & Tellegen, 1996). Economists will also be familiar with the importance of controlling for individual heterogeneity when trying to determine the causal effects of income on well-being (Ferrer-i-Carbonell & Frijters, 2004). We are concerned, however, that aspects of individual heterogeneity, which may not be of

obvious interest to economics, such as personality, may interact with an individual's income. For example, the relationship between a change in income and well-being may be dependent on an individual's personality type. To test this hypothesis we use a well-known longitudinal data set that recently included standard psychological measures of personality to determine whether there are any systematic personality differences between the utility gained from income rises.

Theoretically the case for the use of personality measures in economics seems strong. Borghans et al. (2008) have argued that personality should be given greater consideration when discussing economic parameters and constraints. They suggest that there could be considerable benefit to understanding how economic incentives might influence individuals with different personality traits. From a psychologist's perspective personality research has a long history (see Winter & Barenbaum, 1999) and has developed into a systematic understanding of individual differences. Nevertheless, it is relatively uncommon to find empirical studies that use personality measures within economics. This is beginning to change; with a number of studies investigating an area of economic importance – the determination of an individual's wages. Mueller & Plug (2006), Nyhus & Pons (2005), Groves (2005) and Semykina & Linz (2007) have all used personality measures to predict an individual's wages. For example, Mueller & Plug (2006) show that some personality traits, such as openness and conscientiousness, are rewarded in the market place, whereas other traits, such as agreeableness and neuroticism, are penalized. Nyhus & Pons (2005) draw similar conclusions but also find that the degree of autonomy an individual has is also important. They further find that the financial return to personality varies across educational groups. Groves (2005) investigates the importance of psychological traits, such as autonomy, social withdrawal and aggression in female

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earnings. Semykina & Linz (2007) find that personality traits explain as much as 8% of the gender wage gap.

These types of empirical study may help explain why, after controlling for many factors, including the improved cognitive abilities that come through schooling, there are still large earning gaps. Although the use of personality traits in the determination of wages is very much in its infancy (Bowles et al., 2001b), the findings indicate that personality is an important determinant. Bowles et al. (2001a) have suggested that both school and family pass on many important behavioral traits that enhance the individual's earning success. Other empirical contributions have assessed personality's relation to performance in ultimatum games (Schmitt et al., 2008, Swope et al., 2008), the propensity for an individual to share knowledge with work colleagues (Matzler et al., 2008) and job matching (Winkelmann & Winkelmann, 2008). Researchers have also shown the importance of conscientiousness and self control in the individual's accumulation of wealth (Ameriks et al., 2003, Ameriks et al., 2007) and that conscientiousness appears to be an important factor determining the psychological distress associated with unemployment (Boyce et al., forthcoming). In addition it has been shown that personality plays an important role in the onset of depression arising from low socio-economic status (Jokela & Keltikangas-Jarvinen, forthcoming).

In income and well-being research personality measures have rarely been used (see Boyce (2010) for a recent exception). Due to important policy consequences researchers are concerned with determining causal effects of income on well-being. Hence, researchers are mostly concerned with controlling for personality – not its independent effect. It is argued that personality is most convincingly controlled for by using panel data and trying to explain the within-person variation in subjective well-

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being (Ferrer-i-Carbonell & Frijters, 2004). Personality, being largely thought of as fixed (Costa & McCrae, 1980, Costa & McCrae, 1988, Srivastava et al., 2003), is considered to offer no explanation to the within-person variation in subjective well-being. Within this statistical framework personality measures are, therefore, not directly needed. However, if personality were thought to interact with income then personality measures would aid an investigation. Here, we use personality measures to show that there are substantial income-personality interaction effects. Individuals who have high levels of conscientiousness or high levels of extroversion obtain more satisfaction from income increases, whereas those that are open-to-experiences, agreeable or neurotic tend to get lower satisfaction from income increases. Our results stand up to a number of alternative explanations. Such a finding poses new questions on the links between income and well-being and may have important implications for the use of financial incentives to influence behavior. In the future, public policy may benefit from being personality-specific in a similar way as has been suggested for gender (Alesina & Ichino, 2007).

This paper is structured as follows. Section 2 details the methodology, section 3 describes the data, section 4 discusses the results, including robustness tests, and section 5 concludes.

2. Methodology

The standard approach within economics to determine causal effects of income on subjective well-being (SWB) is the fixed effects estimator. A fixed effect analysis is easily performed when multiple individuals are observed across several time-points.

(1) $SWB_{it} = \alpha + D_{it} + \gamma \log y_{it} + \beta_k X_{it} + \mu_i + \varepsilon_{it}$

The subjective well-being of a given individual, i, at a given time period, t, is dependent upon a number of factors other than income; specific regional and time period factors, D, a series of observable time varying characteristics, X, and individual heterogeneity that, although varying across individuals, does not vary across time, μ. The true causal effect of income can only be obtained provided all these correlated factors are controlled for. Heterogeneous factors, although often unavailable, immeasurable or simply unknown, are captured by the parameter μ. Assuming that the factors contained within μ have zero within-person variation then any changes to an individual's SWB must have arisen from changes to the individual's circumstances.

It is fairly common for researchers to assume that individual heterogeneity is mostly personality (for explicit illustrations of such an assumption see Booth & van Ours (2008), Ferrer-i-Carbonell & Frijters (2004), Frijters, Haisken-DeNew & Shields (2004), Senik (2004) and Vendrik & Woltjer (2007)). However, even when personality measures are available, the fixed effect estimator may still be the best way to control for individual heterogeneity; which may in fact include much more than simply personality. Our estimation strategy is therefore based on the premise that the measures of personality, P, are a subset of μ. A fixed effect estimator is therefore used on equation 2 to determine whether the well-being effects from a change to an individual's household income is dependent upon a vector of personality characteristics, P.

(2) $SWB_{it} = \alpha + D_{it} + \gamma \log y_{it} + \lambda_\pi P_i \bullet \log y_{it} + \beta_k X_{it} + \mu_i + \varepsilon_{it}$

Such an estimation strategy must assume that the vector of personality

measures, P, is appropriately controlled for using the fixed effect estimator which

eliminates μ. Given the widespread use of the fixed effect analysis to control for

personality factors, and individual heterogeneity more generally, this assumption

seems appropriate. Our interest in the main analysis therefore lies simply with

whether the personality measures P, a subset of μ and therefore already controlled for

using the fixed effect technique, interact with income. A well determined coefficient

on any of the personality-income interaction terms would signify that the degree to

which an individual benefits from income is dependent upon personality.

3. Data

It is relatively unusual to find a representative longitudinal data set typically

used in economic analysis that contains reliable personality measures frequently used

by psychologists. The lack of availability of such measures has probably not helped

personality's integration into economic research. However, in a recent wave of the

German Socio-Economic Panel (GSOEP) a set of personality questions were asked.

The Big Five model of personality suggests that there are five overarching

dimensions to personality, that of an individual's openness-to-experience,

conscientiousness, extroversion, agreeableness and neuroticism[1]. Such self-reported

personality judgments have impressive levels of reliability and validity. For example,

self-reported traits are highly stable over time (McCrae & Costa, 1990), are related to

peer ratings (McCrae & Costa, 1987), predict objective behavior (Epstein, 1979) and

occupational success (Hogan, 2005), have biological correlates (Ryff et al., 2006),

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[1] A full description of the personality questions and how the personality dimensions were constructed
can be found in the Appendix

and prospectively predict changes in objective biological functioning over time (O'Cleirigh et al., 2007). The personality measures used in GSOEP are a shortened version of standard Big Five questionnaires and extensive pre-testing was carried out to ensure adequate replication (Gerlitz & Schupp, 2005). Additionally, the personality measures contained in the GSOEP have been reliably used elsewhere (e.g. Boyce, 2010, Boyce et al, 2010, Winkelmann and Winkelmann, 2008). Here, to aid an interpretation of the results the personality scores used are standardized across the sample to have a mean of zero and a standard deviation of one.

The personality variables were asked at only one time point, 2005. However, personality is generally regarded as fixed across time (Costa & McCrae, 1980, 1988, Srivastava et al., 2003) so we assume that these personality measures can be used as an acceptable proxy for personality across all subsequent years. To determine whether there is an income-personality interaction effect on well-being we use a balanced panel running from 2005 to 2008. Although an individual's innate personality may be fixed across time it is possible that an individual would not have answered the same every single year. For example, an individual's response to a given personality question could be highly dependent on an individual's circumstances at the time of questioning. Importantly, however, the personality measures were taken at the start of the panel, in 2005, so this prevents the impact of previous experiences on the answers given to the personality questions.

In all other respects the GSOEP is a representative longitudinal sample of German households. The survey has been used in a number of important subjective well-being studies (for example Clark et al., 2008a, Ferrer-i-Carbonell, 2005, Ferrer-

i-Carbonell & Frijters, 2004, Frijters et al., 2004) and alongside the standard objective characteristics[2] contains a single item life satisfaction question:

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

Individuals are asked to respond to this question on an 11-point scale, where 0 indicates complete dissatisfaction and 10 indicates complete satisfaction. Since it has been shown that there is little difference between estimating effects using cardinal or ordinal models (Ferrer-i-Carbonell & Frijters, 2004) the life satisfaction measure is treated as cardinal. Our analysis uses the household income per month as the income variable, which means that the individual's marginal utility will be based on changes to the income of the household that the individual is attached to. However, we include within our standard set of controls the size of the individual's household and estimate personality-income interaction equations separately for both men and women.

The 4 year balanced panel contains 13615 individuals (6489 men, 7126), producing 54460 individual time-point observations with the descriptive statistics shown in Table 1. Table 1 presents life satisfaction in its raw form but for all the analyses life satisfaction scores are standardized across the sample with a mean of zero and a standard deviation of one to give a meaningful interpretation. In 2005, at the time of answering the personality questions, individuals were on average 47.7 years old, with ages ranging from 17 to 96.

4. Results

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[2] A full description of these variables is contained in the Notes to Tables

In order to first highlight the discrepancies between pooled and fixed effects estimations the analysis begins in Table 2 by estimating the average effect of income on a standardized life satisfaction variable across the whole sample. The pooled OLS and fixed effect models show that household income generally has a positive effect on individual well-being. As is typical the coefficients attached to the pooled model in column 1 are much larger than those of the fixed effect model in column 2. The difference reflects the importance of controlling for heterogeneous factors within individuals. In the pooled OLS model these heterogeneous factors are unlikely to be appropriately controlled for and may drive an individual to be both more satisfied and earn higher levels of income. The fixed effect model, on the other hand, by focusing only on the changes that occur within individuals, successfully controls for such time invariant factors. Each individual, once controlling for other observed changes to their life, will have a unique slope that represents how changes to their household income across the panel related to changes in their life satisfaction. The fixed effect estimates represent the average of all these individual slopes and could be interpreted as the average causal effect on individual well-being. From a practical perspective there would naturally be more interest in the results from the fixed effect model, helping the understanding of how an increase to an individual's household income might raise well-being. There may be far less concern for the pooled OLS model, which reflects only a cross-sectional association. The pooled model does not control for the fixed individual heterogeneity that drives a large proportion of the association between income and well-being.

In column 3 of Table 2 personality variables are introduced into the pooled OLS model. Like the fixed effects estimates in column 2, although not nearly as much, the coefficients are attenuated downwards compared with the pooled OLS

model in column 1. In the final column of Table 2 the individual fixed effect residuals obtained from the fixed effect regression carried out in column 2 are predicted using personality. The personality measures explain only 11% of individual heterogeneity. This still leaves a relatively large unexplained component and suggests that the most convincing way to control for individual heterogeneity and uncover causal effects is using the fixed effect approach. The personality measures are time invariant and therefore cannot be used directly in the standard fixed effect model. However, it is still possible to use them to interact with variables that do vary across time, such as an individual's household income.

Table 3 begins the analysis of whether individuals with different personality traits have different well-being reactions to changes in household income. For example, do individuals that score high on indicators of neuroticism enjoy income changes more or less than individuals that score low on neuroticism? Are extroverted individuals more adversely affected by decreases in their income? To test such hypotheses the personality measures, openness-to-experience, conscientiousness, extroversion, agreeableness and neuroticism are interacted with the household income variable. After controlling for all other changes to an individual's circumstances Table 3 displays the results of the income-personality interactions by gender. The coefficients on the demographic controls, since they are very similar to those in Table 2, are not reported and for completeness the results of both the pooled OLS and fixed effects models are included. Table 3 provides clear evidence that the well-being effects from a change in household income are dependent on an individual's personality and that this personality effect is dependent upon the individual's gender. There is strong evidence from the fixed effect model that conscientious people, both men and women, get higher life satisfaction increases from rises to their household

income than those that are not conscientious. Women who are open-to-experiences, introverted or neurotic appear to obtain lower satisfaction from increases to their household income.

These effects are all significant in the fixed effect model. The results in the pooled model are not completely consistent but are generally supportive of the important role that personality has in the individual's reaction to income increases. It is important to notice the apparent inconsistency between the results for neuroticism in both models across both men and women. The pooled model suggests there is a positive and significant association with subjective well-being yet there is a negative and, for women at least, significant coefficient in the fixed effect model. However, the models measure fundamentally different things; one model concerns the estimation of an association and the other the variation within individuals. Although there may be larger differences in well-being across the income distribution for neurotic individuals this finding is not incompatible with the result that neurotic individuals benefit less from an increase to their income.

The effects presented in Table 3 are substantial. For example, concentrating on the results from the fixed effect models in column 2 and 4; if the income of a typical man were doubled, then life satisfaction is estimated to increase by around 0.21 standard deviations. Since the personality variables have been standardized the estimates suggest that the life satisfaction of a man, for example, with moderately high levels of conscientious (i.e. one standard deviation above the mean) would increase by around 0.25 standard deviations if their income were doubled. Alternatively, moderately conscientious men could be viewed as benefiting from income by around 20% more than men with average conscientiousness levels. Therefore, holding everything else constant, a typical man would need to receive 20%

more income than someone with moderate levels of conscientiousness to reach the same level of satisfaction with life. The effect sizes are even stronger for women and using very similar calculations the results suggest that a typical woman would need at least a 30% higher income increase to get the same life satisfaction gains as other women who are moderately conscientious or moderately extroverted. The results also suggest that income increases are valued less by women who are moderately open-to-experiences or moderately neurotic, by up to 60% and 30% respectively, than a typical woman.

The effects are even more dramatic once we consider doubling the household income of individuals at the extremes. For example, a man with very high levels of conscientiousness (two standard deviations above the mean) would receive a life satisfaction rise of around 0.29 standard deviations. In contrast, an individual with extremely low levels of conscientiousness (two standard deviations below the mean) is predicted to gain just 0.12 standard deviations in life satisfaction. The differences between individuals at the extremes are huge and similar effect sizes are exhibited across the other personality variables. Were we to combine the effects of these personality types then some individuals would have marginal utilities of income that differ greatly to a typical individual, and may even be negative.

5. Conclusion

The overall conclusion is that the extra utility gained from an increase in the individual's household income is heavily dependent upon an individual's personality. Economists normally concentrate on the average effect of an increase in income across an entire population. We show that there are strong personality-income interaction effects. Both men and women who have high levels of conscientiousness

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obtain more satisfaction from increases to their household income. Additionally women that are open-to-experiences, introvert or neurotic tend to get lower satisfaction from increases to their household income. Our results suggest, for example, that individuals who are moderately conscientious would need at least a 20% smaller income increase than typical individuals to achieve the same life satisfaction increases.

This could be an important finding for policy makers in two respects. Firstly, with regards to increasing national welfare and which individuals might benefit the most from rises to their income and secondly, in understanding how individuals might react to economic incentives. We provide some insights into the complex relationship between income and well-being showing that individuals have heterogeneous preferences. Not everyone appears to benefit from changes to their income in the same way and it could be problematic to assume that they do. If the marginal utility from income is different across individuals then individuals will behave differently towards a given financial incentive. This is an important policy concern and suggests tailoring policy according to an individual's personality may make policy more effective. Alesina & Ichino (2007) make a similar argument for gender-specific taxation.

Our results generate some more important questions. There may be strong evidence to suggest that individuals who are conscientious have higher marginal utilities than others, as do women who are closed-to-experiences, extroverted, and not neurotic, but this leaves an important question as to why? On this we can only speculate. Perhaps individuals with certain personalities have a habitual spending pattern that increases their well-being more than others. If so then it is important to establish what these spending patterns are. For example, it would seem plausible that

conscientious individuals might be better planners enabling them to make wiser purchases with their income. Maybe conscientious individuals simply enjoy their income more and are therefore driven to accumulate wealth to a greater extent, or perhaps non-conscientious individuals simply make bad decisions? Such questions need answers, particularly with it becoming increasingly apparent that conscientiousness is important for an individual's economic circusmtances (Boyce et al., forthcoming, Ameriks et al., 2003, Ameriks et al., 2007).

Our work also questions the general importance of income in an individual's life. The personality trait open-to-experiences, which includes a component of whether the individual values artistic experiences, suggests that income simply isn't very important to everybody. Some people may gain more utility from non-monetary areas of life, such as social relationships, cultural or physical activity. It therefore seems important to understand why some people place such a high value on income, in spite of research showing that both psychological therapy (Boyce & Wood, forthcoming) and social relationships (Powdthavee, 2008) have a comparatively higher effect on well-being.

These are many important questions that still need answering but we have shown how exploiting standard psychological measures of personality can help to do this. Economics needs to explore these important questions and be much more open to the use of personality throughout the discipline. The findings presented here perhaps produce many more questions than are solved but could shed new light on future directions in which income and well-being research might take.

Appendix

Personality variables in GSOEP

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There were a number of questions asked in the 2005 wave of the GSOEP that attempt to quantify aspects of an individual's personality. In the questionnaire section entitled "What kind of personality do you have?" there were 15 questions related to the "Big five" personality inventory. These questions were as follows:

Individuals are asked whether they see themselves as someone who…

1. *…does a thorough job*

2. *…is communicative, talkative*

3. *…is sometimes somewhat rude to others*

4. *…is original, comes up with new ideas*

5. *…worries a lot*

6. *…has a forgiving nature*

7. *…tends to be lazy*

8. *…is outgoing, sociable*

9. *…values artistic experiences*

10. *…gets nervous easily*

11. *…does things effectively and efficiently*

12. *…is reserved*

13. *…is considerate and kind to others*

14. *…has an active imagination*

15. *…is relaxed, handles stress well*

Individuals are asked whether the statement applies to them on a 1 to 7 scale, with 1 meaning the statement does not apply to them at all and 7 that it applies perfectly.

Openness to experience used questions 4, 9 and 14.

Conscientiousness used questions 1, 7 and 11 (question 7 was reverse coded)

Extroversion used questions 2, 8 and 12 (question 12 was reverse coded)

Agreeableness used questions 3, 6 and 13 (question 3 was reverse coded)

Neuroticism used questions 5, 10 and 15 (question 15 was reverse coded)

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Note to Tables

Variable:	Description
Life Satisfaction	A self reported measure of how satisfied the individual is with their life, all things considered, where 0=completely dissatisfied and 10=completely satisfied
Monthly Household Income (Euros)	The household's income in which the individual resides
Age	Individual's age
Female	Individual is female (excluded dummy: male)
Household Size	The number of members in the individual's household
Married, Separated, Divorced, Widowed	Individual is married, separated, divorced or widowed (excluded dummy: single)
Unemployed	Individual is unemployed (excluded dummies: any other responses to occupation position except retired)
Retired	Individual is retired (excluded dummies: any other responses to occupation position except unemployed)
Disabled	Disability status of the individual
Child dummy	Whether there is at least one child in the household (excluded dummy: no children in the household)
Personality variables	See appendix for full description

Table 1: Summary statistics (N = 54460) – non-standardized

Variable:	Mean	Standard Deviation
Life Satisfaction (non-standardized)	6.94	1.75
Monthly Household Income (Euros)	2,801	1793.2
Age	48.93	16.77
Female	0.52	0.50
Household Size	2.66	1.24
Married	0.63	0.48
Separated	0.02	0.13
Divorced	0.08	0.27
Widowed	0.06	0.24
Unemployed	0.06	0.24
Retired	0.25	0.43
Disabled	0.11	0.32
Child dummy	0.27	0.45

Table 2: Fixed effect and pooled OLS life satisfaction regressions

Dependent Variable:	(1)	(2)	(3)	(4)
	Life Satisfaction (Standardized)			Fixed Effect Residual (estimated from column 2)
Estimation type	Pooled OLS	Fixed Effect	Pooled OLS	Pooled OLS
Independent Variables:				
Log of Monthly Household Income (Euros)	0.487 (55.71)**	0.165 (10.17)**	0.435 (50.71)**	
Age	-0.035 (20.14)**		-0.033 (19.60)**	
Age squared/1000	0.315 (18.48)**		0.289 (17.46)**	
Female	0.017 (2.11)*		0.045 (5.52)**	
Log of Household Size	-0.289 (21.51)**	-0.103 (4.11)**	-0.243 (18.65)**	
Married	0.100 (6.42)**	0.045 (1.21)	0.109 (7.22)**	
Separated	-0.183 (5.47)**	-0.091 (1.67)	-0.173 (5.35)**	
Divorced	-0.060 (3.07)**	0.135 (2.50)*	-0.073 (3.85)**	
Widowed	-0.063 (2.71)**	-0.429 (6.01)**	-0.078 (3.48)**	
Unemployed	-0.457 (25.53)**	-0.271 (14.21)**	-0.431 (24.88)**	
Retired	0.067 (4.23)**	-0.001 (0.06)	0.109 (7.15)**	
Disabled	-0.426 (32.01)**	-0.092 (3.57)**	-0.365 (28.26)**	
Child dummy	0.132 (10.82)**	0.060 (2.94)**	0.108 (9.15)**	
Standardized Personality Variables:				
Openness-to-Experience			0.059 (14.02)**	0.079 (11.21)**
Conscientiousness			0.049 (11.39)**	0.025 (3.56)**
Extroversion			0.040 (9.36)**	0.043 (6.05)**
Agreeableness			0.069 (16.58)**	0.080 (11.66)**
Neuroticism			-0.177 (43.35)**	-0.202 (30.50)**
Year Dummies	Yes	Yes	Yes	No
Regional Dummies	Yes	Yes	Yes	No
Constant	-2.493 (31.22)**	-1.718 (6.67)**	-2.230 (28.68)**	0.000 (0.00)
Observations	54460	54460	54460	13615
Number of Individuals	13615	13615	13615	
R-squared	0.15	0.01 (within variation)	0.20	0.11

Absolute value of t-statistics in parenthesis * significant at 5%; ** significant at 1%

Table 3: Fixed effects and pooled OLS analysis of personality and household income interaction effects on life satisfaction by gender

Dependent Variable:	(1)	(2)	(3)	(4)
		Life Satisfaction (Standardized)		
Estimation Type	Pooled OLS (Men)	Fixed Effect (Men)	Pooled OLS (Women)	Fixed Effect (Women)
Independent Variables:				
Log of Monthly Household Income (Euros)	0.462 (35.38)**	0.206 (8.43)**	0.421 (34.39)**	0.153 (6.34)**
Personality Interactions:				
Openness-to-Experience	-0.018 (1.69)	-0.030 (1.29)	-0.023 (2.34)*	-0.091 (4.20)**
Conscientiousness	0.055 (5.85)**	0.043 (2.27)*	0.017 (1.80)	0.052 (2.42)*
Extroversion	-0.005 (0.48)	0.026 (1.18)	-0.018 (1.74)	0.053 (2.45)*
Agreeableness	-0.011 (1.11)	-0.017 (0.78)	0.002 (0.24)	-0.038 (1.68)
Neuroticism	0.027 (2.56)**	-0.020 (0.89)	0.050 (5.35)**	-0.059 (2.93)**
Year Dummies	Yes	Yes	Yes	Yes
Regional Dummies	Yes	Yes	Yes	Yes
Demographic Variables	Yes	Yes	Yes	Yes
Constant	-2.40 (20.53)**	-2.38 (4.30)**	-2.14 (19.62)**	-0.26 (0.54)
Observations	25956	25956	28504	28504
Number of Individuals		6489		7126
R-squared	0.23	0.02	0.19	0.01
		(within variation)		(within variation)

Absolute value of t-statistics in parenthesis
* significant at 5%, ** significant at 1