

# The Effects of Personality Traits on Economic, Health, and Social Constructs of Life Satisfaction: A Polytomous Variable Latent Class Analysis Approach

Sandra P. Garcia  
Javier M. Rodriguez  
Claremont Graduate University

## Abstract

Personality traits affect the way individuals perceive and behave in the world they live in. This study examines if classes of domains of life satisfaction (DLS) – income, health, family relationships, and work – cluster into classes and whether the probability of belonging to any of these classes correlates with the Big Five personality traits. Using latent class analysis and, subsequently, a multinomial logit regression ( $n=3,242$ ), the results suggest that there are four classes of life-domains satisfaction and the propensities to belong to these classes are especially correlated with personality traits such as neuroticism, extraversion, and conscientiousness. The findings reveal that (1) neurotics tend to belong to a class of individuals who tend to be unsatisfied across all DLS whether they are economically well-off or not, (2) individuals with high levels of extraversion tend to belong to a class of individuals who tend to be satisfied across these DLS whether they are well-off or not, and (3) going from low to high levels of consciousness shifts the high probability of belonging to a class of being non well-off and unsatisfied across all DLS to a high probability of belonging to a class of being economically well-off and satisfied across all DLS.

**Keywords:** Life Satisfaction · Happiness · Personality Traits

## **1 Introduction**

Since the time of Plato, happiness – a strong correlate of life satisfaction – has been considered to be among the upmost goals of human existence. This conceptualization of life aspirations has transcended time, geographies, and nations. From the 1776 US Declaration of Independence to the 1948 United Nations Universal Declaration of Human Rights, the pursuit of happiness has been established not only as an ultimate human right but also as a goal to be promoted by governments and the benefits of modern civilization. But how human psychology operates to promote or suppress life satisfaction is a question that remains to be answered and is, thus, increasingly gaining the attention of research scientists across the globe.

The objective of this study is to investigate if variation in personality traits correlates with variation in the distribution of satisfaction in domains of life that includes subjective and objective measures. The domains-of-life satisfaction literature has traditionally considered a person's overall life satisfaction as an additive composite of his/her levels of satisfaction across a predetermined set of life domains. This paper proposes that key domains of life satisfaction such as income, health, work, and family do not necessarily work additively but instead generate clusters of domains-of-life satisfaction and that these clusters are correlated with the Big Five personality traits neuroticism, extraversion, openness, conscientiousness, and agreeableness.

Considering that individuals are complex entities, and therefore manifest heterogeneity in the way different domains fit into their lives, we implement an unsupervised machine learning technique in order to explore the ways in which different domains-of-life satisfaction interact with each other and cluster into mutually exclusive classes. Subsequently, we implement a supervised machine learning technique to assess the relationship that personality traits may have with the tendency to belong to classes of life satisfaction. One key objective of this paper is to

pair new methodological techniques to test new aspects reported in domains-of-life satisfaction literature.

### **1.1 Satisfaction in Domains of Life**

Life satisfaction is usually defined as a cognitive evaluation of the overall quality of one's experiences across the entire lifespan (DeNeve and Cooper 1998; Diener 1984). There are two common ways through which social scientists have advanced their research on life satisfaction; one mostly focuses on studying individuals' overall life satisfaction, whereas the other focuses on individuals' satisfaction in different realms of life. Many studies that explore the links between overall life satisfaction and satisfaction in different domains of life assume an additive specification (Easterlin and Sawangfa 2007; Rojas 2006; Van Praag et al. 2003). That is, overall life satisfaction is specified as a weighted average of domains-of-life satisfaction. This conceptualization has the underlying assumption that the more or less satisfied an individual feels in a specific domain of life the more or less he or she is satisfied with his/her life in general.

This article builds upon the observation that key domains-of-life satisfaction (e.g., health, work, family relationships, and income) are not necessarily experienced by individuals in an additive fashion. We hypothesize that there is a trade-off of satisfaction levels across different domains of life. Table 1 illustrates this point, where only 21% of the data are situated in the diagonal, indicating there is heterogeneity in the distribution of individuals across quartile levels of income and satisfaction with family relationships. It may be the case that higher levels of income may come at the expense of less high-quality time spent with significant others, like family members. As Table 1 illustrates, there is a non-trivial number of upper income individuals who are unsatisfied with their family relationships as well as lower income individuals who feel satisfied with their family relationships. The opposite is also true: there are individuals with high

Income	Satisfaction with Family Relationships				Total
	1	2	3	4	
1	142	148	188	224	702
2	192	189	234	175	790
3	222	242	246	140	850
4	236	269	278	117	900
<b>Total</b>	792	848	946	656	3,242

**Table 1** MIDUS II participants by quartile levels of income and satisfaction with family relationships (1=bottom quartile, 4=top quartile). This table illustrates a high level of sample heterogeneity in two key domains of life satisfaction

income who are satisfied with their family relationships and low-income individuals who are unsatisfied with their family relationships. To acknowledge such heterogeneity allows us to contemplate the possibility that there may be classes of life satisfaction constituted by higher-level interactions between domains of life over and beyond commonly identified associations. We therefore hypothesize that there may be different classes of life satisfaction, and each of these classes composed of different level-combinations of satisfaction across domains of life.

Life satisfaction research has been relatively arbitrary in terms of the specific number of domains of life implemented to assess life satisfaction and no consensus exists on either the number or scope of such domains (Cummins 1996). For instance, Cummins (1996) measured life satisfaction through seven domains of life: overall well-being, health, productivity, intimacy, safety, community, and emotional well-being. Similarly, Rojas (2006) distinguished seven main domains of life, defined as: health, economic, job, family, friendship, family, and community environment. And Easterlin and Sawangfa (2007) explored four domains of life: financial situation, family life, health, and work. In this study we propose the use of parsimony by exploring four key domains of life satisfaction: health, work, family, and income.

Because key domains of life naturally belong to objective and subjective constructs, some ‘quality of life’ scholars have pointed out the need to include both objective and subjective

measures (Cummins 2000a; Schulz 2000). These authors have suggested that the study of social preferences requires a multidisciplinary perspective that combines the advantages of objective and subjective indicators. The underlying goal is to analytically incorporate the objective and subjective complexities that enclose overall assessments of how individuals feel about their lives. Following this approach some life satisfaction scholars have assessed the relationship between objective measures like income and subjective measures such as overall life satisfaction (Frijters et al. 2004; Gardner and Oswald 2007; Clark et al. 2008; Diener et al. 1993; Frijters et al. 2005; Cummins 2000b), job satisfaction (Clark and Oswald 1996), health satisfaction (Frijters et al. 2005), financial satisfaction (Hsieh 2004), and family satisfaction (Wang et al. 2004). Building upon this objective-subjective approach, this article employs total household income as an objective domain-of-life and perception of health, work, and family relationships as subjective domains of life.

## **1.2 Personality Traits and Life Satisfaction**

While the literature on personality traits is rather new to economics, psychologists have long studied personality along with intelligence, interests, and motivation, assessing differences and similarities within and between individuals. The widely used “Big Five” personality traits to describe human personality are Openness [to new experiences], Conscientiousness, Extraversion, Agreeableness, and Neuroticism. These five traits are known by the acronym OCEAN. Borghans et al. (2008) found that personality traits have high predictive power – especially those related to Conscientiousness, and, to lower extent, Neuroticism – on a variety of life outcomes. These personality traits are known to predict a range of labor, educational, and health outcomes. Conscientiousness, for example, is a powerful predictor of overall educational attainment and achievement, overall job performance, and longevity (Barrick and Mount 1991; Lievens et al.

2002; Kern and Friedman 2008)

Some researchers have examined the relationship between domains-of-life satisfaction and personality traits. McCrae and Costa (1991) found that neuroticism has the strongest association among all the Big Five personality traits with life satisfaction ( $r=-0.37$ ) followed by conscientiousness ( $r=0.24$ ) and extraversion ( $r=0.22$ ). In their meta-analysis, DeNeve and Cooper (1998) analyzed 137 distinct personality traits akin to the Big Five factors and also found that neuroticism was the strongest, negatively related trait to life satisfaction ( $r=-0.24$ ) and that conscientiousness showed the strongest, positive association with life satisfaction ( $r=0.22$ ) followed by extraversion ( $r=0.17$ ). Schimmack et al. (2002) showed that extraversion, neuroticism, and conscientiousness explain 65% of life satisfaction variance. Along with this research, Pavot and Diener (2008) found that perceptions of life satisfaction are likely to be influenced by personality traits, most notably extraversion and neuroticism.

This paper attempts to contribute to the study of human flourishing by examining non-additive relationships between well-known personality traits and domains-of-life satisfaction using an agnostic approach where domains of life are allowed to cluster statistically rather than through a priori hypotheses. This procedure accounts for the unobservable heterogeneity that exists in individuals' satisfaction across domains of life, providing thus an advantage over traditional study models of life satisfaction.

## **2 Data**

The data were from participants in MIDUS II (the National Survey of Midlife Development in the United States) who completed the phone and the self-administered questionnaire collected between 2004 and 2006 ( $n=4,041$ ). MIDUS II included a wide array of psychosocial, economic, and behavioral indicators, thus making it suitable to test the hypothesis proposed in this article.

Since we used complete data cases, the final analytic sample consisted of 3,242 cases.<sup>1</sup> For descriptive statistics and description variables refer to Table 1A and Table 2A in the Appendix, respectively.

### **3 Methods**

We followed a two-step procedure in order to investigate if personality traits were associated with different combinations of satisfaction-levels in key domains of life. First, we assumed that domains-of-life satisfaction was a construct mainly composed of, or at least closely related to, self-assessments in four key domains of life: health, work, family, and income. Domains-of-life satisfaction was therefore a non-observable (latent) variable comprised of non-additive associations between these four domains in life. By using a technique called polytomous variable latent class analysis (hereafter LCA), we generated mutually exclusive classes of life satisfaction. LCA grouped similar individuals into classes that showed high within-class homogeneity and high between-class heterogeneity. Thus, by using LCA, we were able to exploit unobservable heterogeneity across manifested indicators to identify the classes in the data, and estimate the most probable class membership for each respondent.

Once the different combinations of domains-of-life satisfaction indicators that generated the classes were fitted and each respondent was assigned to belong to the class that best fitted his/her own characteristics, a multinomial logit (MNL) estimation procedure was implemented to test for associations between respondents' personality traits and belonging or not to any given

---

<sup>1</sup> A low number of participants showed missing data in their Big 5 personality trait scores (an average of 38 missing data cases per scale with a range between 29 and 66 cases). Most of the missing data were from participants who did not report their levels of satisfaction with their family relationships and work (n=326 and 300, respectively). Looking at the four domains of life satisfaction, missing data in one domain is unrelated to missing data in other domains. A missing data correlation matrix revealed very low correlations in missingness among domains of life satisfaction and between domains and personality trait scores (with an average correlation of 0.041 and a correlation range between 0.019 and 0.086).

class. The independent variables in this regression were the personality traits plus covariates. The dependent variable(s) were the fitted classes (coded as 1 when the respondent showed the higher probability of belonging to that specific class, and coded as 0 otherwise). Each individual was therefore assigned to belong to exactly one class. The MNL allowed us to estimate the probability of belonging to any given class conditional on manifested levels of personality traits. The models also controlled for age, education, and gender. Given that satisfaction scores in family relationships could arise from relationships with partners, children, or both, we further controlled for having (or not) children, and having (or not) a partner.

## **4 Results**

### **4.1 Latent Class Analysis**

We successfully fitted models for 2 to 5 classes. Models for 6 classes or more did not fit the data appropriately or did not converge, thus, they were discarded. The LCAs were fitted using maximum likelihood estimation. We fitted each model 10 times to guarantee that the maximum likelihood fit was not local but global (Linzer and Lewis 2011).

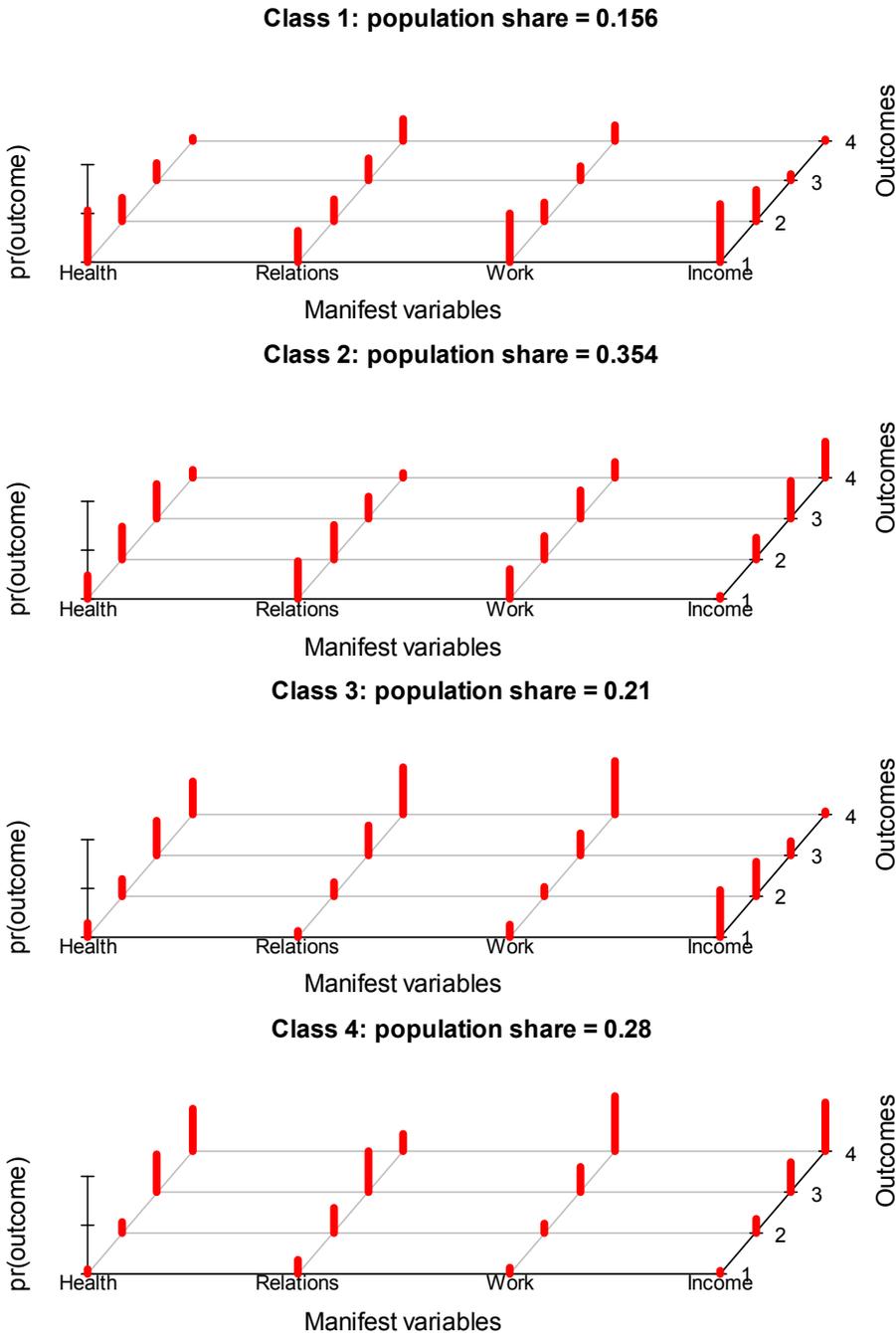
A model with four latent classes of life domains was chosen because it offered a better fit to the data, as it is depicted by the AIC, the BIC, and the  $\chi^2$  fit statistics (Table 2). This model also was the most parsimonious; it is comprised by the fewest classes while showing a good fit to the data relative to the other models. The model for 5 classes generated “subclasses” instead of primary groups in the sample; for example, the 5-classes model generated a class with only 8% of the sample in it, which was derived from one of the classes fitted in the 4-classes model without altering the composition of the remaining classes. Figure 1 visualizes the composition of the four fitted classes. Figure 1 is divided into four 3-D bar plots, one per class.

	<b>2 Classes</b>	<b>3 Classes</b>	<b>4 Classes</b>	<b>5 Classes</b>
<i>AIC</i>	34210	33461	33154	33067
<i>BIC</i>	34423	33814	33648	33670
$\chi^2$	883	456	309	322

**Table 2** Polytomous Variable Latent Class Analysis Fit Statistics for 2 to 5 Classes Models. AIC=Akaike Information Criterion; BIC=Bayesian Information Criterion;  $\chi^2$ =Chi-square

To simplify the interpretation of results, we termed Class 1 the “Unsatisfied and Non-well-off” class (hereafter, UNW) because individuals in this class (15.5% of the sample) tended to have low satisfaction values across all domains of life, including a tendency to have low income levels (Figure 1, top panel). We called Class 2 the “Unsatisfied and Well-off” class (hereafter, UW) because individuals in this class (35.4% of the sample) tended to be economically well-off while only achieving mid- to low-levels of satisfaction in all other domains of life. Class 3 stands for the “Satisfied and Non-well-off” class (hereafter, SNW) because individuals in this class (21% of the sample) show a tendency to have low income levels while tending to achieve favorable levels of satisfaction across all other domains of life. And finally, we labeled Class 4 the “Satisfied and Well-off” class (hereafter, SW) because individuals in this class (28.1% of the sample) show a tendency to have favorable satisfaction values in all domains of life satisfaction, including a tendency to be economically well-off.

These four classes (Figure 1) depict how the distribution of satisfaction in key domains of life cluster into mutually exclusive typologies, thus illustrating that domains-of-life satisfaction in a society follow complex structures not identified in the current literature. That domains of life indicators clustered well into mutually exclusive classes needed not to be true. This finding gives support to the first hypothesis.



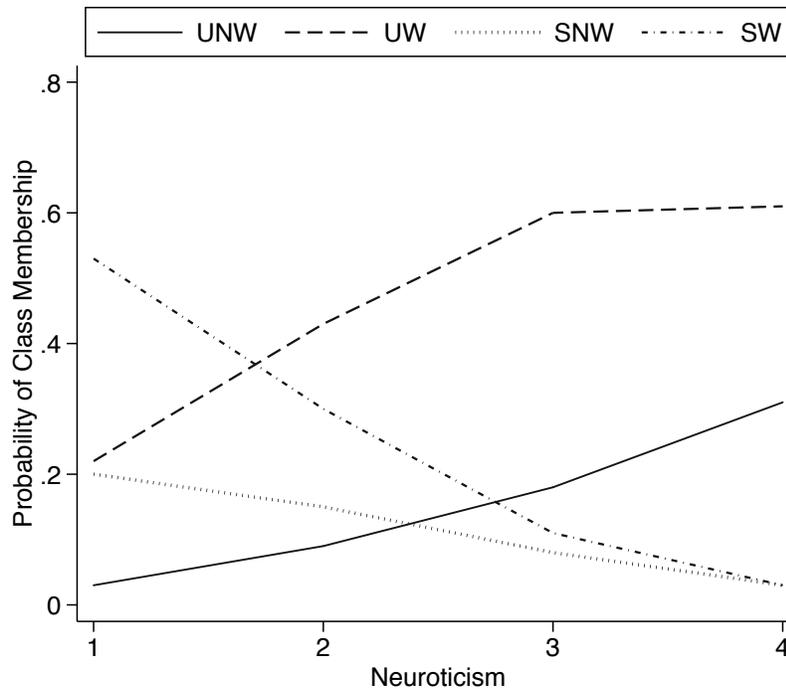
**Fig. 1**

Structural illustration of the 4 fitted classes of life satisfaction. Figure 1 is divided into four 3D bar plots, one per class. The Y-axis is the probability that any given participant in the class would have the category value (1 through 4) in each variable. The X-axis is labeled by variable (i.e., self-rated health status scale (Health), family relations scale (Relations), work satisfaction scale (Work), and household income (Income)). The Z-axis shows the category outcome values for all indicators in the classes (1 through 4, 1 being the lowest quartile and 4 being the highest quartile for all variables)

## 4.2 Regression Analysis

Considering that satisfaction in key domains of life is patterned by high-level interactions that make them group into mutually exclusive classes, we ran a multinomial logit regression where belonging or not to any of the four fitted classes is our output of interest. The main objective of this regression is to estimate if certain personality traits have an effect on the probability of individuals belonging to any of the four classes of domains-of-life satisfaction. Since the estimated coefficients are multinomial logit, they represent the effect of a one-unit change of the independent variable on the log-ratio of belonging to a specified class (in our case, class UW, SNW, or SW) with respect to a baseline class (class UNW), and so their interpretation is not intuitive (for regression output see Table 3A in the Appendix). Results are therefore graphically displayed (Figures 2 through 6). Figures 2 through 6 show the simulation of the predicted probability of class membership (Y-axis) versus the respective personality trait scale (X-axis), holding the rest of the covariates constant at their mean.

Figure 2 shows there is a high level of variation in the probabilities of class membership associated with neuroticism. Individuals with higher levels of neuroticism ( $\geq 3$ ) have about a 60% chance to belong to the UW class. This means that higher levels of income do not buy satisfaction across other domains of life for individuals with a high level of neuroticism. This situation is also reflected in the very low probability (about 5%) of belonging to the SNW class or the SW class, respectively at the highest level of neuroticism. These results suggest that individuals with a high level of neuroticism have a very low probability of being satisfied in domains of life irrespective of their income level. This finding differs from that of individuals with the lowest level of neuroticism, who show a 55% chance to belong to the SW class. Alternatively, individuals with the highest level of neuroticism show a 30% probability of

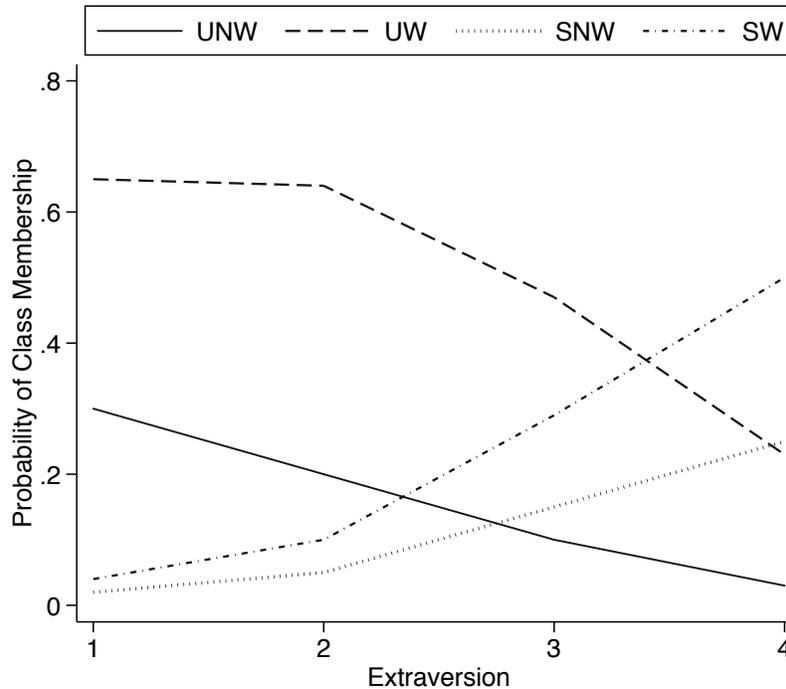


**Fig. 2**

The figure plots the probability of life satisfaction class membership associated with neuroticism for four classes of domains-of-life satisfaction: UNW(Unsatisfied and Non-well-off), UW(Unsatisfied and Well-off), SNW(Satisfied and Non-well-off), and SW(Satisfied and Well-off). Trends derived using fitted values from the multinomial logit regression output (Table 3A); all covariates were set at their mean value

belonging to the UNW class. In sum, going from low to high levels of neuroticism drastically increases the probability of belonging to either the UNW class or the UW class: neurotic individuals have a higher probability of being unsatisfied with or without money. This is expected since neurotics tend to see the world through negative/pessimistic lenses (Marshall et al. 1992), a feature of their personality that, independently from helping them to increase their income or not, will not permit them to achieve higher levels of satisfaction in other key domains of life.

Figure 3 shows that being more extraverted increases the probability of belonging to the SNW class and, to a much higher extent, it also increases the probability of belonging to the SW class (from about 2% to 25% and 50%, respectively). Alternatively, the lowest level of



**Fig. 3**

The figure plots the probability of life satisfaction class membership associated with extraversion for four classes of domains-of-life satisfaction: UNW(Unsatisfied and Non-well-off), UW(Unsatisfied and Well-off), SNW(Satisfied and Non-well-off), and SW(Satisfied and Well-off). Trends derived using fitted values from the multinomial logit regression output (Table 3A); all covariates were set at their mean value

extraversion is associated with a 30% chance of belonging to the UNW class and a 65% chance of belonging to the UW class, the former probability being close to 5% at the highest level of extraversion. There is practically no difference between the probabilities of belonging to the UW class and belonging to the SNW class at the highest level of extraversion (both at about 25%). These findings bring to light that, in general, high levels of extraversion are mostly associated with a higher probability of being satisfied with or without money, and that the lack of extraversion is strongly associated with lower levels of satisfaction in health, work, and family relationships especially among those that tend to be well-off.

It is worth noting that what happens at the lowest level of extraversion happens at the highest levels of neuroticism, and vice versa (see Figures 2 and 3). Trends between neuroticism

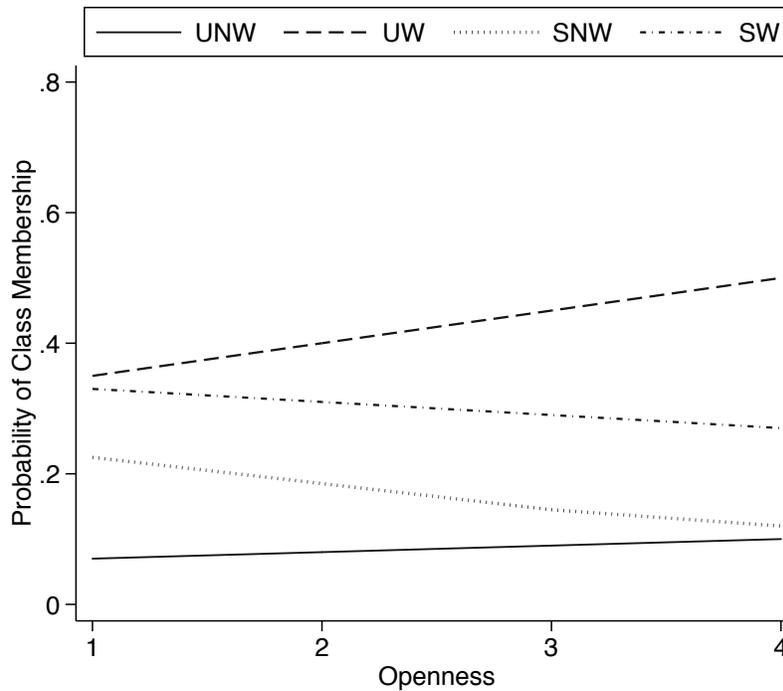
and extraversion are practically reversed, suggesting that neuroticism takes from domains-of-life satisfaction what extraversion gives. For example, highly extroverted individuals have a probability of 50% of achieving more favorable levels of satisfaction across all four domains of life (i.e., to belong to the SW class) while highly neurotic individuals only have a 5% probability of belonging to this class. Non-well-off or well-off, highly neurotic individuals have a total probability of 90% of being unsatisfied with their health, work, and family relationships; non-well-off or well-off, highly extraverted individuals have a total probability of 75% of being satisfied with their health, work, and family relationships. Interestingly, considering that these are mutually exclusive classes, this trade-off between neuroticism and extraversion happens across interactions between cross-category levels of satisfaction in domains of life, and not under the typical relational assumptions presumed by current research.

In two seminal works, McCrae and Costa (1991) and DeNeve and Cooper (1998) found that neuroticism has the strongest linear, negative effect on life satisfaction, whereas extraversion showed a positive, linear effect on life satisfaction. These two patterns are also depicted in Figures 2 and 3 by the opposite trends of the SW class and the UNW class. However, the linear models advanced in McCrae and Costa (1991) and DeNeve and Cooper (1998) do not capture other ways in which satisfaction in domains of life are interrelated. Their models do not speak for individuals who, for example, tend to be economically well-off and tend to show non-favorable levels of satisfaction in other domains of life, or for individuals who tend not to be well-off and tend to show favorable levels of satisfaction in other domains of life (i.e., the UW class and the SNW class). Their linear model specifications of life satisfaction ignore the unobservable heterogeneity that exists in individuals' satisfaction across domains of life. Our findings improve on their approach by precisely showing, for example, that the UW class

dominates the probability spectrum of belonging to any given class in relation to both neuroticism and extraversion. As a matter of fact, only 43.6% of the sample (class UNW plus class SW) seems to match the monotonic correspondence that is usually assumed in current life satisfaction research where more of a given component of life satisfaction is strictly associated with more of the others, and vice versa.

Our findings also suggest that findings from research studies that follow the aforementioned approach are correct but partial, since the trade-off in domains-of-life satisfaction related to neuroticism and extraversion is mostly related to the level of satisfaction that, for many individuals, cannot be bought via income and, to some extent, to the levels in domains-of-life satisfaction that some individuals can still attain in spite of their unfavorable economic condition. Note that the SW class and the SNW class, like the UW class and the UNW class, show similar trends with regards to both neuroticism and extraversion (Figures 2 and 3) – an interesting finding considering that these classes are mutually exclusive and thus the probabilities of belonging to them are *not* correlated with each other. Trends of the probabilities of membership to typologies of domains-of-life satisfaction conditional on neuroticism and extraversion are dominated by interactions between *subjective* and *objective* assessments. These findings highlight that the study of domain-of-life satisfaction would greatly benefit from interdisciplinary efforts.

Figure 4 shows a situation where being or not being open to new experiences has a subtle association with the propensity to belong to any of the classes, all else equal. As openness increases, there is a slight tendency to belong to the UNW class and the UW class and to not belong to the SNW class and the SW class. Also, the probabilities of belonging to the UW and SW classes converge at the lowest level, but diverge at the highest level, of openness. The



**Fig. 4**

The figure plots the probability of life satisfaction class membership associated with openness for four classes of domains-of-life satisfaction: UNW(Unsatisfied and Non-well-off), UW(Unsatisfied and Well-off), SNW(Satisfied and Non-well-off), and SW(Satisfied and Well-off). Trends derived using fitted values from the multinomial logit regression output (Table 3A); all covariates were set at their mean value

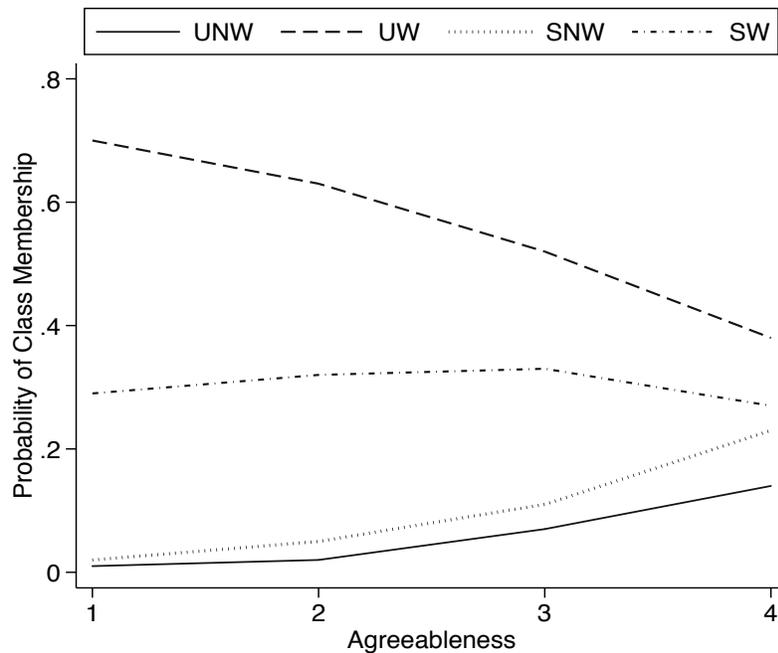
pattern for the probabilities of belonging to the UNW and SNW classes is the opposite: Diverge at the lowest level and converge at the highest level of openness. Another feature of the patterns is that, as openness increases, the rate at which the probability of belonging to the SW class decreases is very similar to the rate at which individuals increase their probability to belong to the UNW class. Something similar can be said about the UW and SNW classes: As openness increases, individuals tend to belong to the UW class at the same rate at which they decline to belong to the SNW class.

These patterns corroborate, and expand, findings in recent research. For example, Steel et al. (2008) found that openness is not significantly associated with life satisfaction. In a more focused study, Judge et al. (2002) found that openness is only weakly related to job satisfaction.

Graph 2c exemplifies these findings. The association between openness and the probability of belonging to any given class is heterogeneous – it depends on the class of satisfaction individuals tend to experience. What can be said, however, is that by accounting for sample heterogeneity in life satisfaction researchers may help to elucidate the diversity of patterns that levels of satisfaction follow across various domains of life, independently and in conjunction.

Figure 5 shows moderate-to-weak relationships between agreeableness and the probabilities of belonging to classes of domains-of-life satisfaction. In general, agreeableness turns initial wide differences between probabilities of class membership (located at low levels of agreeableness) into posterior similarities at the right tail of its spectrum. The strongest association is portrayed by a 30% decline of the probability to belong to the UW class as agreeableness increases from its minimum to its maximum value. Noticing that agreeableness does not affect the propensity to belong to the SW class, the decline in the probability of belonging to the UW class is necessarily translated into moderate tendencies to increase the probability to belong to the UNW and SNW classes, respectively. Summarily, being or not being agreeable does not move individuals in or out of the SW class (class 4); what seems certain is that, irrespective of having a propensity to show higher levels of satisfaction with health, work, and family relationships, higher levels of agreeableness tend to slightly increase the chances of individuals moving from the UW class into classes where there is a tendency to have lower income.

Figure 6 depicts some non-monotonic forms of the relationships between conscientiousness and domains-of-life satisfaction. For example, the probability of belonging to

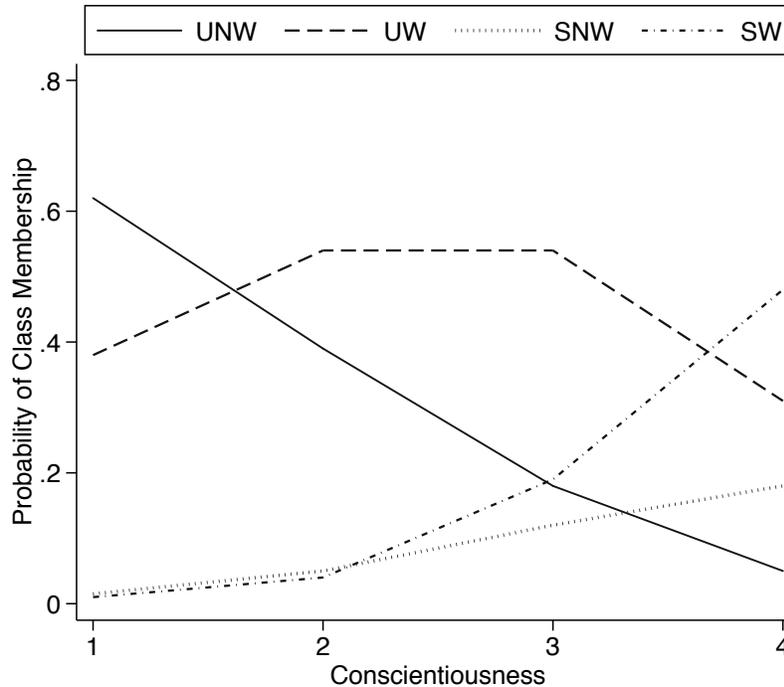


**Fig. 5**

The figure plots the probability of life satisfaction class membership associated with agreeableness for four classes of domains-of-life satisfaction: UNW(Unsatisfied and Non-well-off), UW(Unsatisfied and Well-off), SNW(Satisfied and Non-well-off), and SW(Satisfied and Well-off). Trends derived using fitted values from the multinomial logit regression output (Table 3A); all covariates were set at their mean value

the UW class draws an inverse parabola throughout the conscientiousness spectrum while the probability of belonging to the SW class increases drastically as conscientiousness increases. These patterns differ from the probabilities of belonging to the UNW class and the SNW class, which decrease and increase, respectively, in a linear fashion as conscientiousness increases. It is worth recalling that these patterns are generated by the high-level composite interactions that assemble the structure of the classes and by the interactive nature of the MNL algorithm, thus being able to capture and reproduce the complexities associated with sample heterogeneity.

Considering that the UNW and the SW classes epitomize the worst and best possible scenarios of domains-of-life satisfaction, Figure 6 shows a pattern with powerful implications: The incremental level of conscientiousness is associated with a simultaneous, substantive decline



**Fig. 6**

The figure plots the probability of life satisfaction class membership associated with conscientiousness for four classes of domains-of-life satisfaction: UNW(Unsatisfied and Non-well-off), UW(Unsatisfied and Well-off), SNW(Satisfied and Non-well-off), and SW(Satisfied and Well-off). Trends derived using fitted values from the multinomial logit regression output (Table 3A); all covariates were set at their mean value

(from about 60% to 5%) in the propensity to belong to the UNW class and a substantive increase (from about 1% to 50%) in the propensity to belong to the SW class. These trends intersect at about the “some” level of conscientiousness (i.e., level 3) signaling that, at that level of conscientiousness, individuals may either belong to the UNW class or to the SW class with an equal probability of about 18%, all else equal. Interestingly, the difference between these probabilities of class membership is mostly noticeable when the conscientiousness scale goes from 3 to 4, thus suggesting that it is at the highest level of conscientiousness where individuals drastically shift from belonging to the “worst” UNW class to belonging to the “best” SW class (a difference in class membership probability of about 45%).

This finding corroborates some of the previous research findings on the effects of conscientiousness over satisfaction in some key domains of life. For example, Mount et al. (1998) found that conscientiousness is positively associated with job performance. Barrick and Mount (1991) found that conscientiousness is positively associated with three job performance criteria (job proficiency, training proficiency, and personnel data such as turnover, tenure, and salary level) for five occupational groups (professionals, police, managers, sales, and skilled/semi-skilled) and these findings were corroborated by Salgado (1997). Other research found that conscientiousness is also positively related to health-related behaviors (Bogg and Roberts 2004) and family relationships (Shackelford et al. 2008). Our analysis pushes forward this set of findings by showing that conscientiousness is a key personality trait – especially at the high-end of the conscientiousness spectrum – through which individuals can shift the fate of their domains-of-life satisfaction. Considering that conscientiousness is positively associated with job performance and proficiency (Barrick and Mount 1991; Mount et al. 1998), and that these may be closely related to work satisfaction – one of the components of domains-of-life satisfaction – employers may invest in programs to enhance conscientiousness among their personnel and/or pre-select individuals through hiring processes that target prospect employees with high levels of conscientiousness. Our findings suggest that this may be a practical “win-win” formula to enhance productivity in labor environments while promoting domains-of-life satisfaction among individuals.

## **5 Conclusions**

This study finds that satisfaction in key domains of life are not necessarily distributed in society in an additive, linear, monotonic fashion. Rather, we show that the distribution of the components of life satisfaction as well as the motivations and capabilities of individuals are

multidimensional. Accordingly, levels of satisfaction in domains of life cluster into mutually exclusive classes of individuals with similar response values, and these response values follow higher-level interactions. In some instances the structural compositions of the classes manifest the typical associations that are described in current research, but in other instances they do not. Our methods push forward the research agenda on life satisfaction by illustrating the importance of accounting for sample heterogeneity.

The Big Five personality traits show various types of associations and different substantial associations (from weak to strong) with the propensity to belong to classes of domains-of-life satisfaction. Personality traits like neuroticism, extraversion, and conscientiousness show to be strongly associated with the propensity to follow typologies of domains-of-life satisfaction while personality traits like openness and agreeableness show moderate-to-weak levels of association.

Individuals with high levels of neuroticism tend to belong to a class of domains-of-life satisfaction where individuals tend to manifest lower levels of satisfaction with their work, their family relationships, and their health. This pattern is true irrespective of income, representing individuals who tend to be economically well-off or non-well-off. Alternatively, individuals with high levels of extraversion tend to manifest favorable levels of satisfaction with their work, their family relationships, and their health. This pattern is irrespective of income, characterizing individuals who tend to be economically well-off or not well-off. Patterns related with these personality traits are mainly differentiated by individuals' propensity to increase or decrease satisfaction in domains of life outside of income.

Findings also show that as conscientiousness increases individuals increase their probability of belonging to a class where they tend to show higher levels of satisfaction across all

domains of life. Importantly, this increased tendency to belong to the SW class as conscientiousness increases comes at the expense of taking individuals out of the UNW class. This finding is highly important given that going from low to high levels of conscientiousness show to change individuals' life satisfaction by switching them from the worst possible to the best possible domains-of-life satisfaction scenario.

Results suggest that actors and institutions interested in maximizing society's welfare should shift their attention toward the important role that personality traits play in predicting domains-of-life satisfaction. In addition, future research on how key domains of life relate to each other to affect overall life satisfaction may lead to a broader understanding of the role that income or material gains plays in determining a person's subjective well-being. Policies and programs should not only focus on economic growth or solely on efforts to equalize the distribution of income; they should also address the inequalities extant in the distribution of those key domains of life that lead to life satisfaction. Given that personality traits are associated with how humans classify, interpret, and perform across the domains of life that affect their overall life satisfaction, institutions like the educational system should not only focus on the development of skills that exclusively lead to higher income in the labor market but also on psycho-educational strategies that could help attenuate negative personality traits like neuroticism, and/or promote positive personality traits like extraversion and conscientiousness. Future research should also look at the effects of early socialization processes within family structures and/or social organizations, the effects of the media, and the role of authoritative public figures, among others.

## References

- Barrick, M. R., & Mount, M. K. (1991). The big five personality dimensions and job performance: a meta-analysis. *Personnel psychology, 44*(1), 1-26.
- Bogg, T., & Roberts, B. W. (2004). Conscientiousness and health-related behaviors: a meta-analysis of the leading behavioral contributors to mortality. *Psychological bulletin, 130*(6), 887.
- Borghans, L., Duckworth, A. L., Heckman, J. J., & Ter Weel, B. (2008). The economics and psychology of personality traits. *Journal of Human Resources, 43*(4), 972-1059.
- Clark, A. E., Frijters, P., & Shields, M. A. (2008). Relative income, happiness, and utility: An explanation for the Easterlin paradox and other puzzles. *Journal of Economic Literature, 95*-144.
- Clark, A. E., & Oswald, A. J. (1996). Satisfaction and comparison income. *Journal of public economics, 61*(3), 359-381.
- Cummins, R. A. (1996). The domains of life satisfaction: An attempt to order chaos. *Social Indicators Research, 38*(3), 303-328.
- Cummins, R. A. (2000a). Objective and subjective quality of life: An interactive model. *Social Indicators Research, 52*(1), 55-72.
- Cummins, R. A. (2000b). Personal income and subjective well-being: A review. *Journal of Happiness Studies, 1*(2), 133-158.
- DeNeve, K. M., & Cooper, H. (1998). The happy personality: a meta-analysis of 137 personality traits and subjective well-being. *Psychological bulletin, 124*(2), 197.
- Diener, E. (1984). Subjective Well-Being. *Psychological bulletin, 95*(3), 542.
- Diener, E., Sandvik, E., Seidlitz, L., & Diener, M. (1993). The relationship between income and subjective well-being: Relative or absolute? *Social Indicators Research, 28*(3), 195-223.

- Easterlin, R. A., & Sawangfa, O. (2007). Happiness and domain satisfaction: Theory and evidence.
- Frijters, P., Haisken-DeNew, J. P., & Shields, M. A. (2004). Money does matter! Evidence from increasing real income and life satisfaction in East Germany following reunification. *American Economic Review*, *94*, 730-740.
- Frijters, P., Haisken-DeNew, J. P., & Shields, M. A. (2005). The causal effect of income on health: Evidence from German reunification. *Journal of health economics*, *24*(5), 997-1017.
- Gardner, J., & Oswald, A. J. (2007). Money and mental wellbeing: A longitudinal study of medium-sized lottery wins. *Journal of health economics*, *26*(1), 49-60.
- Hsieh, C.-M. (2004). Income and financial satisfaction among older adults in the United States. *Social Indicators Research*, *66*(3), 249-266.
- Judge, T. A., Heller, D., & Mount, M. K. (2002). Five-factor model of personality and job satisfaction: a meta-analysis. *Journal of applied psychology*, *87*(3), 530.
- Kern, M. L., & Friedman, H. S. (2008). Do conscientious individuals live longer? A quantitative review. *Health Psychology*, *27*(5), 505.
- Lievens, F., Coetsier, P., De Fruyt, F., & De Maeseneer, J. (2002). Medical students' personality characteristics and academic performance: a five-factor model perspective. *Medical education*, *36*(11), 1050-1056.
- Linzer, D. A., & Lewis, J. B. (2011). poLCA: An R package for polytomous variable latent class analysis. *Journal of Statistical Software*, *42*(10), 1-29.
- Marshall, G. N., Wortman, C. B., Kusulas, J. W., Hervig, L. K., & Vickers Jr, R. R. (1992). Distinguishing optimism from pessimism: Relations to fundamental dimensions of mood and personality. *Journal of personality and social psychology*, *62*(6), 1067.
- McCrae, R. R., & Costa, P. T. (1991). Adding Liebe und Arbeit: The full five-factor model and well-being. *Personality and social psychology bulletin*, *17*(2), 227-232.

- Mount, M. K., Barrick, M. R., & Stewart, G. L. (1998). Five-factor model of personality and performance in jobs involving interpersonal interactions. *Human performance, 11*(2-3), 145-165.
- Pavot, W., & Diener, E. (2008). The satisfaction with life scale and the emerging construct of life satisfaction. *The Journal of Positive Psychology, 3*(2), 137-152.
- Rojas, M. (2006). Life satisfaction and satisfaction in domains of life: is it a simple relationship? *Journal of Happiness Studies, 7*(4), 467-497.
- Salgado, J. F. (1997). The Five Factor Model of personality and job performance in the European Community. *Journal of applied psychology, 82*(1), 30.
- Schimmack, U., Diener, E., & Oishi, S. (2002). Life-Satisfaction Is a Momentary Judgment and a Stable Personality Characteristic: The Use of Chronically Accessible and Stable Sources. *Journal of personality, 70*(3), 345-384.
- Schulz, W. (2000). *Explaining Quality of Life: The Controversy Between Objective and Subjective Variables*: PLG.
- Shackelford, T. K., Besser, A., & Goetz, A. T. (2008). Personality, Marital Satisfaction, and Probability of Marital Infidelity. *Individual Differences Research, 6*(1).
- Steel, P., Schmidt, J., & Shultz, J. (2008). Refining the relationship between personality and subjective well-being. *Psychological bulletin, 134*(1), 138.
- Van Praag, B. M., Frijters, P., & Ferrer-i-Carbonell, A. (2003). The anatomy of subjective well-being. *Journal of Economic Behavior & Organization, 51*(1), 29-49.
- Wang, M., Turnbull, A. P., Summers, J. A., Little, T. D., Poston, D. J., Mannan, H., et al. (2004). Severity of disability and income as predictors of parents' satisfaction with their family quality of life during early childhood years. *Research and Practice for Persons with Severe Disabilities, 29*(2), 82-94.

## Appendix

Variable	Mean	Std. Dev.	Min	Max
<i>Domains of Life</i>				
<b>Health</b>	2.57	1.06	1	4
<b>Family</b>	2.45	1.07	1	4
<b>Work</b>	2.72	1.17	1	4
<b>Household Income</b>	2.60	1.11	1	4
<i>Personality Traits</i>				
<b>Neuroticism</b>	2.06	0.62	1	4
<b>Extraversion</b>	3.10	0.56	1	4
<b>Openness to Experience</b>	2.90	0.53	1	4
<b>Conscientiousness</b>	3.40	0.45	1	4
<b>Agreeableness</b>	3.44	0.50	1.2	4
<i>Covariates</i>				
<b>Education</b>	3.19	1.20	1	5
<b>Age</b>	55.29	11.86	30	84
<b>Gender</b>	1.55	0.50	1	2
<b>No children</b>	0.06	0.25	0	1
<b>No partner</b>	0.16	0.37	0	1

**Table 1A** Descriptive statistics of the analytic sample

<b>Health</b>	<ul style="list-style-type: none"> <li>• Self-reported assessment of the participant’s health</li> <li>• Original scale goes from 1 to 10 (1=worst possible health, 10=best possible health)</li> <li>• Recoded by quartiles (e.g., 1=bottom 25%, 4=top 25%)</li> </ul>
<b>Family relationships</b>	<ul style="list-style-type: none"> <li>• Composed of two self-reported assessment variables: <ul style="list-style-type: none"> <li>▪ Relationship with current spouse/partner</li> <li>▪ Relationship with children</li> </ul> </li> <li>• Original scale goes from 1 to 10 (1=worst possible relationship, 10= best possible relationship)</li> <li>• Recoded by quartiles (e.g., 1=bottom 25%, 4=top 25%)</li> <li>• To maintain the most of the information, those without children and those without a partner were given a value of “0” in each scale</li> <li>• To control for possible coding effects, we further control in the regression analysis for having or not having a partner or children</li> <li>• <i>No-Child</i>: Coded as without children (=1) or having children (0)</li> <li>• <i>No-Partner</i>: Coded as without partner (=1) or being married or having a partner (=0)</li> </ul>
<b>Work</b>	<ul style="list-style-type: none"> <li>• Self-reported assessment of the participant’s current work situation, whether part-time or full-time, paid or unpaid, at home or at a job site</li> <li>• Original scale goes from 1 to 10 (1=worst possible work situation” and 10 indicating “best possible work situation”</li> <li>• Recoded by quartiles (e.g., 1=bottom 25%, 4=top 25%)</li> <li>• Self-reported assessment of the participant’s health</li> </ul>
<b>Income</b>	<ul style="list-style-type: none"> <li>• Total household income, calculated by summing wage, pension, supplemental security income, and government assistance</li> <li>• Recoded into quartiles (e.g., 1=bottom 25%, 4=top 25%)</li> <li>• Income thresholds: 1= &lt;\$31,000, 2= \$31,000 - \$61,000, 3= \$61,001 - \$105,000, and 4= &gt;\$105,000</li> </ul>
<b>Personality Traits</b>	<ul style="list-style-type: none"> <li>• Respondents were asked how much each of 26 self-descriptive adjectives represented them</li> <li>• The 26 adjectives are closely related to the Big Five personality traits: <ul style="list-style-type: none"> <li>▪ Openness to Experience: <i>creative, imaginative, intelligent, curious, broad-minded, sophisticated, and adventurous</i></li> <li>▪ Conscientiousness: <i>organized, responsible, hardworking, careless, and thorough</i></li> <li>▪ Extraversion: <i>outgoing, friendly, lively, active, and talkative</i></li> <li>▪ Agreeableness: <i>helpful, warm, caring, softhearted, and sympathetic</i></li> <li>▪ Neuroticism: <i>moody, worrying, nervous, and calm</i></li> </ul> </li> <li>• Each of the five personality trait scales corresponds to the arithmetic mean across the respective adjective scales</li> <li>• A 4-point scale was used to assess how well each of the adjectives described the participant (1=not at all, 2=a little, 3=some, 4=a lot)</li> </ul>
<b>Education</b>	<ul style="list-style-type: none"> <li>• Coded from 1 to 5 (1=less than high school (&lt;HS), 2=HS/GED, 3=some college/associate’s degree, 4=bachelor’s degree, and 5=graduate degree or higher)</li> </ul>
<b>Gender</b>	<ul style="list-style-type: none"> <li>• Coded as male (=1) or female (=2)</li> </ul>

**Table 2A** Description and coding of variables

<i>Class 2/Class 1</i>				
	<b>Coeff.</b>	<b>Std. error</b>	<b>t value</b>	<b>p value</b>
<b>(Intercept)</b>	7.55	1.54	4.92	0.000
<b>Age</b>	-0.13	0.01	-9.01	0.000
<b>Gender</b>	-0.52	0.25	-2.03	0.044
<b>Education</b>	1.15	0.14	8.14	0.000
<b>No-child</b>	-0.53	0.53	-1.01	0.316
<b>No-partner</b>	-3.93	0.44	-8.98	0.000
<b>Neuroticism</b>	-0.46	0.21	-2.21	0.028
<b>Extraversion</b>	0.40	0.27	1.49	0.138
<b>Openness to Experience</b>	0.03	0.27	0.13	0.897
<b>Conscientiousness</b>	0.87	0.28	3.15	0.002
<b>Agreeableness</b>	-1.29	0.31	-4.22	0.000
<i>Class 3/Class 1</i>				
<b>(Intercept)</b>	-11.74	1.92	-6.13	0.000
<b>Age</b>	0.05	0.01	3.57	0.000
<b>Gender</b>	0.34	0.27	1.23	0.220
<b>Education</b>	0.58	0.13	4.37	0.000
<b>No-child</b>	0.02	0.62	0.03	0.974
<b>No-partner</b>	-0.52	0.28	-1.83	0.069
<b>Neuroticism</b>	-1.47	0.23	-6.42	0.000
<b>Extraversion</b>	1.77	0.30	5.97	0.000
<b>Openness to Experience</b>	-0.33	0.28	-1.19	0.236
<b>Conscientiousness</b>	1.84	0.31	5.87	0.000
<b>Agreeableness</b>	-0.09	0.33	-0.28	0.781
<i>Class 4/Class 1</i>				
<b>(Intercept)</b>	-2.52	1.78	-1.41	0.160
<b>Age</b>	-0.11	0.02	-7.21	0.000
<b>Gender</b>	-0.27	0.27	-1.00	0.319
<b>Education</b>	1.63	0.15	10.57	0.000
<b>No-child</b>	-0.38	0.55	-0.70	0.483
<b>No-partner</b>	-3.74	0.47	-7.93	0.000
<b>Neuroticism</b>	-1.79	0.23	-7.77	0.000
<b>Extraversion</b>	1.76	0.30	5.89	0.000
<b>Openness to Experience</b>	-0.17	0.29	-0.58	0.564
<b>Conscientiousness</b>	2.44	0.33	7.44	0.000
<b>Agreeableness</b>	-1.10	0.34	-3.29	0.001
<i>Number of Observations</i>		3242		
<i>Maximum log-likelihood</i>		-16496.37		
<i>AIC</i>		33154.75		
<i>BIC</i>		33647.55		
<i>Chi-square</i>		308.91		

**Table 3A** Results from latent class regression analysis with four classes. Coefficients are multinomial logit, estimated with respect to Unsatisfied Non-well-off Class (Class 1). For a graphical display of the composition of the classes see Figure 1 in the text

