DISCUSSION PAPER SERIES

Personality Traits and Household Consumption Choices

Lucia Mangiavacchi
Luca Piccoli
Chiara Rapallini

DISCUSSION PAPER SERIES

Personality Traits and Household Consumption Choices

Lucia Mangiavacchi
Universitat de les Illes Balears and IZA

Luca Piccoli
Universitat de les Illes Balears and IZA

Chiara Rapallini
Università di Firenze

ABSTRACT

Personality Traits and Household Consumption Choices*

In this paper, we test whether consumption choices are affected by personality traits and whether this impact is different for singles and individuals living in couples. To fulfill this aim, we test the impact of personality on preferences for different commodities using the German Socio-Economic Panel (SOEP) and estimating a system of Engel curves that includes personality traits as demographic shifters. The analysis is conducted on four different samples: single men, single women, childless couples and couples with children. The inclusion of personality traits among demographic shifters helps to reduce unobserved heterogeneity and improves the goodness of fit of the Engel curves specification by an average of 15.7%. In comparing the results for singles and couples, we find evidence of a consumption-based marital surplus for Mental Openness and Conscientiousness. These traits are characterized by positive assortative mating, and they have a significant and consistent impact on the expenditure for several commodities for both singles and couples. For instance, similarly open-minded partners are likely to spend household resources on culture, and their joint consumption of such goods may be a potential reason for their marital surplus.

Corresponding author:
Luca Piccoli
Department of Applied Economics
Universitat de les Illes Balears
Crt Valldemossa km. 7.5
Palma de Mallorca
Spain

E-mail: luca.piccoli@uib.es

1 Introduction

In this paper, we examine the role played by personality traits in consumption decisions for both individuals and households. In the past two decades, a flourishing number of contributions in the economics literature have investigated the role played by personality traits in predicting both individual decision making and life outcomes across a wide variety of domains. First, in examining the interplay between education and individual outcomes in the labor market, economists have recognized that personality traits are an important component of human capital (Heckman et al., 2013; Rustichini et al., 2016; Almlund et al., 2011; Borghans et al., 2008; Bowles et al., 2001b). The domains in which personality traits have been shown to be relevant go well beyond academic and labor market outcomes, mainly including credit scores, financial decisions, portfolio choices and business attitudes (Bucciol and Zarri, 2017; Caliendo et al., 2016; Conlin et al., 2015; Caliendo et al., 2014; Brown and Taylor, 2014).

With an even wider perspective, present-day economics contributions to personality research include analyses in which the economic facet is one among several: for example, personality has been proved to be an important moderator in determining how income and life events impact subjective well-being (e.g. Proto and Rustichini, 2015; Boyce and Wood, 2011) and social cohesion (Rapallini and Rustichini, 2016).

Similarly, the well-known evidence –among psychologists– that personality predicts marital satisfaction (e.g. Gaunt, 2006) is now common to economists who examine the role of personality in the marriage market (Dupuy and Galichon, 2014) as well as in intrahousehold bargaining on time use and partners' labor supply (Flinn et al., 2018). Indeed, the potential role of personality in couple formation was mentioned as early as Becker (1973) in his seminal model of the marriage market, where couples were characterized mainly by production complementarities and specialization between partners (Becker, 1981). In the Beckerian framework, marital surplus was generated by negative assortative mating on the personality traits that predict positive outcomes in the labor market and household production, with the husband being high in traits associated with better labor market performances and the wife in traits that imply higher productivity in domestic tasks. However, as women's labor force participation has increased, and the relative significance of household (rather than market) production has declined, complementarities in consumption have become more important sources of gains to marriage (Lundberg and Pollak, 2007; Stevenson and Wolfers, 2007). Accordingly, positive assortative mating on personality has been interpreted as evidence that consumption complementarities, such as those due to the joint consumption of public goods, are of greatest benefit when individuals with similar preferences for consumption and leisure are matched (Lundberg, 2012).

In this work, we link consumption preferences with personality for individuals living both in a one-person household and in a couple, being aware of the possible existence of assortative mating on personality traits. Stemming from the idea that personality traits shape consumption preferences (Lundberg, 2012), we test their impact on preferences for different commodities in

samples of singles, couples and couples with children. We first estimate a system of Engel curves[1] by gender using a sample of one-person households. The study of the choices of male and female singles, for whom there is no couple's decision and an absence of children, allows us to draw conclusions regarding the influence of personality on consumption choices. Second, we estimate a system of Engel curves for people living in childless couples, including both the husband's and wife's personality traits. Then, we estimate a system of Engel curves for a sample of couples with children, again considering the personality traits of both partners. If the effects of a particular personality trait on a few consumption categories are significantly similar for singles and individuals living in couples, together with positive assortative mating on this trait, we interpret these findings as evidence of the presence of a consumption-based marital surplus. In other words, the persistence of the impact of a specific personality trait on different commodities from one-person households to couples is here interpreted as a direct test of the presence of a marital surplus in consumption-based couples. This finding is true when the sorting on a specific personality trait is positive, assuming that couples who are similar in this trait benefit more from joint consumption of household public goods. Furthermore, in such a case, the marital surplus could be due to the fact that partners agree quite easily on consumption decisions. Lundberg (2012) already provided evidence of similarity in a few traits of personality in the sorting of men and women into marriage and on the probability of divorce when personalities are too far divided. She interprets her findings as proof of the increasing spread of couples based on consumption complementarities among the younger cohorts living in Germany. We instead directly estimate the effect of personality on consumption choices for people living in households with different compositions; however, our interpretation is in line with the approach that she suggested.

Similar to the bulk of the literature investigating the role of personality in economic decisions, we adopt the Big Five taxonomy. There is substantial agreement among personality psychologists on a five-factor structure to account for substantive covariations in personality descriptions (Costa and McCrae, 1989) and broad agreement about the labeling of these five factors, i.e., Extraversion (attitude toward being active, being forthcoming and desiring social relationships), Agreeableness (being friendly, warm and sensitive towards others), Conscientiousness (being systematic, goal-oriented and self-disciplined), Neuroticism (worrying, being nervous and being emotionally unstable) and Mental Openness (or Intelligence –being imaginative, creative, curious and unconventional).

We use the German SOEP, which records the Big Five personality traits assessment in several waves, including 2009, and comprehensive household consumption information in 2010 while referring to 2009 expenditures. By pooling the two waves and retaining those households (and individuals) for which both consumption expenditure and personality traits are observed, we are able to estimate a complete system of Engel curves and to address our research questions.

This paper aims to contribute to the literature along two main lines. First –as far as we know–

---

[1]Consumption preferences cannot be studied by means of a complete demand system because price variation is not available in the data.

consumption is a crucial sphere of economic decisions for which the effect of personality traits has not yet been investigated either at the individual or at the household level. We fill this literature gap by analysing the impact of personality on consumption decisions and how the inclusion of personality traits improves the estimation of Engel curves for each consumption category. Second, by focusing on household consumption choices, we shed light on the marital surplus in societies where women's participation in the labor market is increasingly widespread and the Beckerian model of marriage –based on the specialization of the partners– is probably decreasingly common. In contrast, complementarities on consumption may become crucial to explain the formation, and success, of domestic partnerships. The remainder of the work is organized as follows. Section 2 introduces the background literature. Section 3 describes the data and the empirical strategy. Section 4 discusses the main results. Section 5 concludes and suggests avenues for further research.

2 Background

2.1 Personality traits and economic outcomes

Bowles et al. (2001b) surveyed for the first time the broad empirical evidence showing that apparently similar individuals, in terms of age, years of schooling, years of labor market experience, parents' level of schooling, occupation, and income, receive quite different earnings. In these seminal contributions, Bowles et al. (2001b,a) suggested that personality –or behavioral– traits be included in a theoretical human capital model. Personality traits are termed "incentive-enhancing preferences", meaning that they allow the employer to induce effort at lower cost, and they are clearly distinguished from cognitive skills. The individual's rate of time preference as well as the locus of control –measured by the Rotter scale– are the traits that were taken into account in these first papers. From then on, the idea that the labor market may remunerate not only cognitive skills but also the individual's noncognitive abilities achieved an increasing consensus among economists. In fact, evidence that productivity and the earnings of workers can be predicted by personality, mainly by the traits of Conscientiousness and Mental Openness, is emerging from more recent survey data analysis (Fletcher, 2013; Hanes and Norlin, 2011; Nyhus and Pons, 2005) and from studies based on experimental settings using real effort tasks (Carpenter, 2016; Cubel et al., 2016). Apart from the crucial role played by the two abovementioned traits, there is scholarly agreement that different traits predict earnings differently according to the worker's gender and that the magnitude of this effect is comparable to that of cognitive skills (e.g. Roberts et al., 2007; Mueller and Plug, 2006).

The comparison between the predictive power of cognitive and noncognitive skills and the research on the interplay between education and personality in the labor market is currently a crucial topic in the literature. This interplay is characterized by both direct and indirect effects of personality on the two domains. In the seminal model of Bowles et al. (2001b), personality has a direct effect on individual productivity, but personality may also have an indirect effect by affecting preferences for schooling and/or occupational choices. In addition, there is much evidence –well

4

known among psychologists– that personality directly predicts educational outcomes (Poropat, 2009; Duckworth et al., 2007). Considering both the direct and indirect effects and examining a broader sample of behaviors, Heckman and colleagues showed that individuals who received a preschool intervention aimed at improving noncognitive skills during childhood, namely, the Perry preschool program, as adults have higher levels of educational attainment, employment and marriage and lower levels of crime than individuals who did not receive the intervention (Heckman et al., 2013). Moreover, they found evidence that although the Perry program did not produce long-term gains in IQ, it did create persistent improvements in personality skills, and the latter are crucial for long-term goals in all the aforementioned domains (Heckman et al., 2013; Almlund et al., 2011; Borghans et al., 2008).

Combined with the comparison between the role played by cognitive and noncognitive skills, the predictive power of personality is currently being investigated for the spheres of economic decisions in which risk attitude and time preference are the individual characteristics that are traditionally taken into account (Rustichini et al., 2016). The high correlation between these types of preferences and certain personality traits suggested new research venues. There is evidence, albeit not claimed to be complete, that personality –especially the Mental Openness and Extraversion traits– affects the transition into self-employment and that survival in self-employment is reduced for people who score high in the Agreeableness trait (Caliendo et al., 2014). The same study showed that risk tolerance has an influence on the decision to enter self-employment and on survival in self-employment, even when the authors control for the Big Five, and that the explanatory power of all the observed personality constructs amounts to 30% of all the observable variables. More specifically, in finance, Bucciol and Zarri (2017) show that the Agreeableness and Neuroticism traits have a significant negative correlation with financial risk taking, as measured by the holding and the amount of stock assets. Investigating both individuals and couples, Brown and Taylor (2014) analyzed the relationship between personality traits and financial decision making, focusing on unsecured debt and financial assets. They showed that Conscientiousness, Extraversion, and Agreeableness correlate with the amount of unsecured debt and savings. They also found significantly negative correlations with stock holding and the Extraversion trait in the sample of couples and the Agreeableness trait in the sample of singles. Within this framework, and closer to the topic of this paper, a promising field of research has analyzed how personality affects both couple formation and the economic decisions made within a household.

2.2 Assortative mating and personality traits

The potential role of personality in couple formation was originally identified by Becker (1973) in his seminal model of the marriage market. Although most of the successive studies on the marriage market examined marital sorting based on a single-dimensional trait –mainly education or earnings, psychological traits were recognized by Becker (1973) as one of the possible dimensions of marital sorting. Thanks to the availability of personality inventories in large samples, a number of recent studies have examined the role of personality traits in the marriage market (Lundberg,

2012), assortative mating (Dupuy and Galichon, 2014) and couples labor supply (Flinn et al., 2018).

Dupuy and Galichon (2014) proposed a theoretical model to test empirically for the dimensionality of sorting in the marriage market and to evaluate the importance of personality traits in couples' joint utility. Using data of Dutch households, they provided evidence that sorting occurs on multiple indices, including education, personality traits, BMI and the health status of the spouses, rather than on just a single dimension, as assumed in most of the current literature. This finding implies that individuals face important trade-offs between the attributes of their potential spouse. They observe homogamy only over the Conscientiousness trait and complementarity among the other traits. In detail, women face a trade-off between being attractive to more conscientious men and being attractive to more autonomous men. Similarly, among the Dutch couples, there was evidence that more conscientious women prefer more agreeable men, but more extraverted women prefer less agreeable men. Men therefore face a trade-off between being attractive to more conscientious women and being attractive to more extraverted women. In a nutshell, and excluding the Conscientiousness trait, the other traits matter differently for men and women. As a second finding, this study showed that personality traits explain a percentage of couples' joint utility in marriage similar to that of education: 17% vs. 28%.

The role of personality traits in couples' labor supply and resources allocation was structurally modeled by Flinn et al. (2018) using a sample of childless Australian couples. They found marital sorting on the Mental Openness and Neuroticism traits as well as a relation between positive sorting on these traits and higher levels of cooperation within a couple. They also found that personality is an important determinant of household bargaining weights and has an impact on wages comparable in magnitude to that of education. In particular, a percentage increase in the score of the Agreeableness trait reduces the Pareto weight by 0.8%. In addition, the Conscientiousness trait has an important positive impact on the labor market outcomes of both partners, and its difference within a couple also explains the gender wage gap.

Closer to our focus, Lundberg (2012) studied the role of production and consumption complementarities in couple formation and dissolution in Germany across different cohorts, examining the effects of personality traits. She argued that although production complementarities within the household have become less important than in the past because of the increase in women's labor force participation, there is not enough direct evidence that individual gains from marriage have become more consumption-based. To fill this gap, she used personality traits as proxies of preferences, and capabilities, to directly examine the marital surplus due to the joint consumption of household public goods. Returns to marriage due to production complementarities led to the standard prediction of gender specialization within the household and negative assortative mating (Becker, 1973), while complementarities in consumption were of greatest benefit among individuals with similar preferences (Lam, 1988) and implied positive assortative mating on traits related to preferences for household consumption among consumption-based marriages. Thus, Lundberg (2012) inferred that homogamy in a personality trait is related to the consumption benefits of

6

marriage. In particular, she provided evidence that the Mental Openness and Conscientiousness traits are positive predictors of marriage, and marital stability, for German couples of the younger cohorts, being –probably– associated with a high demand for marital public goods. For German couples of the older cohorts of the population, she instead found that psychological traits have more gender-specific effects, thus being consistent with the theoretical hypothesis of specialization in marriage.[2]

3 Data and empirical strategy

3.1 Data and sample selection

This study uses data from the German SOEP,[3] a representative ongoing longitudinal survey of the German population. It suits the needs of our study because it records Big Five personality trait assessments in several waves, including 2009, and in the 2010 wave, it records comprehensive household consumption information from 2009. The two waves are pooled, and only those households (and individuals) for which both consumption expenditure and personality traits are observed are retained in the sample .[4] It is worth noting that although the methodology of collecting consumption expenditure data differs, and the aggregation of consumption items is broader with respect to typical household budget surveys, there is sufficient detail to estimate a complete system of Engel curves, which allows us to address our research questions.

For the objectives of the study, four different samples are selected: the first two are composed of childless singles, men and women, and the last two are composed of couples without children and couples with children younger than 16. In this way, we can study how personality influences consumption preferences for individuals living in households with different compositions, which –in a broad sense– may represent different moments of the individuals' life cycle.[5] The samples of singles are composed of 3,715 individuals in total, which, once missing values in expenditures or other characteristics included in the empirical specifications are accounted for, is reduced to 2,271 observations: 1,299 women and 972 men. The samples of childless couples are composed of 4,428 observations in total, which is reduced to 2,512 once all missing values are accounted for. Finally, the sample of couples with children is composed of 1,982 families, which is reduced to

---

[2]The different roles of marital sorting for older and younger cohorts in Germany found in Lundberg (2012) are consistent with quite persistent traditional gender roles in Germany, where labor market participation rates among married women are still low, especially in the former western part of the country, although constantly increasing. Also using the German SOEP, Pestel (2017) examined the relationship between marital sorting and female labor supply in East and West Germany. He observed a high level of assortative mating on education for couples where both partners have a medium or low level of education; for highly educated couples, there were marginal levels of sorting, especially in West Germany. He also found more attachment to the labour market among East German wives independent of the husband's earning quintile.

[3]DOI: 10.5684/soep.v32.1, see Wagner et al. (2007).

[4]The SOEP data sample has been prepared using the PanelWhiz stata add-on (Haisken-DeNew and Hahn, 2010).

[5]Such a sample selection clearly impedes any claim of representativeness for the study. Nevertheless, we are interested in the microaspect of the interaction between personality traits and household consumption choices and consequently prefer to avoid the notable theoretical and empirical issues that would arise from including older children and also dependent elderly relatives or other forms of complex families.

1,035 once all missing values are accounted for. We consider only children younger than 16, as when older children are present, it would be implausible to assume that consumption decisions are made only by the two adults. Actually, when a couple's children are adolescents –or young adults– they should also be considered decision makers.

3.2 Consumption variables

In wave 2010, the SOEP collected information on household consumption in 2009,[6] asking for information on expenditures on 16 aggregated commodities and services: food at home, food out of the home, clothing and shoes, personal hygiene, health, telecommunications, education, culture, leisure time, vacations, life and pension insurance, other insurance, car repairs, transportation, furniture, and other expenditures. For each item, three questions were asked: whether there was an expenditure on the specific item, the amount of the monthly expenditure and the amount of the yearly expenditure (see Appendix A).[7] We use the monthly expenditure as our main consumption measure, substituting the yearly expenditure divided by twelve when the monthly value is missing and zero when both are missing and the household declared that it did not consume the item.

Because of the large number of missing records in certain consumption categories, we aggregated life and pension insurance and other insurance into a unique insurance category and car repairs and transportation into a broader transportation category. As a consequence, the final system includes 13 categories: food at home, food out of the home, clothing and shoes, personal hygiene, health, telecommunications, education, culture, leisure time, vacations, insurance, transportation, and other expenditures.[8] Although slightly aggregated, all expenditure categories were preserved, producing a complete consumption expenditure system for nondurable goods (as in Pollak and Wales, 1981, for instance), where total expenditure is the sum of expenditures in all categories. Descriptive statistics on budget shares and total expenditure are reported in the first parts of Tables 1 and 2 for singles and couples. The largest share of the household budget is spent on food at home, accounting for roughly 34-38% in all samples, followed by insurance, with 10-16%, and vacations, with about 7% for singles and 10-12% for couples. All other budget shares are below 10%, and the smallest ones are education and culture at approximately 1% for both singles and couples.

Finally, as detailed in Section 3.5, one possible concern when estimating demand systems is the potential endogeneity of total expenditure. The main cause is measurement error, due either to the infrequency of purchases or to recall errors. As instruments for total household

---

[6]Appendix A reports the questions used by the SOEP to assess household consumption.

[7]The pros and cons of collecting survey data on consumption by recall, vs. the diary method, have been reviewed by Crossley and Winter (2014), who showed that information collected by the former method is quite accurate. Marcus et al. (2013) compared consumption data collected in the SOEP (2010) with those of the Income and Expenditure Survey (EVS) that was conducted in 2008 and was based on diary records. After pointing out several reasons that a perfect overlap between the consumption distributions of the two data sources should not be expected, they concluded that the two likely reflect the relevance of certain consumption categories in similar ways.

[8]The last category, other expenditures, accounting for about 3% of the total expenditure on average, is omitted from the demand system to avoid collinearity.

Table 1: Descriptive statistics for the sample of singles, 2,271 obs.

Variable	Women		Men	
	Mean	Std. Dev.	Mean	Std. Dev.
Budget shares				
Food at home	0.385	0.186	0.347	0.185
Food out of the home	0.046	0.057	0.081	0.083
Clothing/shoes	0.067	0.058	0.054	0.053
Personal hygiene	0.062	0.052	0.036	0.033
Health	0.045	0.059	0.028	0.045
Telecomunications	0.066	0.047	0.069	0.051
Education	0.011	0.043	0.011	0.039
Culture	0.014	0.023	0.015	0.022
Leisure time	0.037	0.052	0.044	0.059
Vacations	0.073	0.108	0.073	0.112
Insurance	0.099	0.097	0.128	0.123
Transportation, car repairs	0.065	0.080	0.082	0.099
Total expenditure	706.9	588.8	755.8	653.7
Demographics				
Age	61.6	18.1	51.7	17.2
Age square	4118.4	2029.6	2964.4	1829.8
Works full-time	0.221	0.415	0.467	0.499
Works part-time	0.153	0.360	0.123	0.329
Perceives an old-age or disability pension	0.568	0.496	0.317	0.466
Immigrant to Germany since 1948	0.049	0.216	0.056	0.230
Own dwelling	0.338	0.473	0.306	0.461
Lives in an urban settlement	0.706	0.456	0.661	0.474
Lives in East Germany	0.258	0.438	0.278	0.448
Education and Personality Traits				
Amount of education or training (in years)	11.849	2.665	12.472	2.717
Mental Openness	4.426	1.327	4.407	1.200
Conscientiousness	5.896	0.912	5.746	0.948
Extraversion	4.801	1.134	4.644	1.153
Agreeableness	5.605	0.946	5.284	0.924
Neuroticism	3.972	1.259	3.543	1.179
Observations	1299		972	

expenditure, it is common practice to use wealth indicators and/or monetary income. In this case, we use personal income derived from either work or pension and ownership of several items, such as car, motorcycle, microwave, dishwasher, washing machine, stereo, color TV, DVD player, DVD recorder, PC/laptop, telephone, mobile phone, deep freezer, dryer, vacation house, air conditioning, alarm system and solar system. These indicators are summarized by the first three components of a principal component analysis (Jackson, 2005), all of which have an eigenvalue significantly greater than 1 in all samples, a criterion often used to assess the number of relevant components (see Figure 1).

Table 2: Descriptive statistics for the sample of couples, 3,547 obs.

Variable	Childless couples		Couples with children	
	Mean	Std. Dev.	Mean	Std. Dev.
Budget shares				
Food at home	0.347	0.165	0.341	0.144
Food out of the home	0.049	0.053	0.043	0.040
Clothing/shoes	0.059	0.050	0.073	0.052
Personal hygiene	0.043	0.032	0.034	0.024
Health	0.038	0.049	0.018	0.017
Telecomunications	0.045	0.032	0.051	0.034
Education	0.007	0.022	0.013	0.046
Culture	0.012	0.018	0.010	0.015
Leisure time	0.046	0.053	0.038	0.044
Vacations	0.118	0.122	0.100	0.103
Insurance	0.126	0.102	0.162	0.102
Transportation, car repairs	0.072	0.075	0.082	0.076
Total expenditure	1424.3	1246.5	1614.7	1478.9
Demographics				
Husband's age	62.2	14.0	40.9	6.8
Wife's age	59.4	13.9	37.9	6.4
Husband's age squared	4064.4	1605.3	1717.3	579.9
Wife's age squared	3726.9	1532.2	1479.5	487.3
Husband full-time worker	0.344	0.475	0.817	0.387
Wife full-time worker	0.246	0.431	0.164	0.371
Husband part-time worker	0.109	0.312	0.127	0.333
wife part-time worker	0.207	0.405	0.567	0.496
Husband perceives an old-age or disability pension	0.575	0.494	0.016	0.126
Wife perceives an old-age or disability pension	0.458	0.498	0.014	0.119
Husband is immigrant	0.068	0.251	0.115	0.320
Wife is immigrant	0.076	0.265	0.136	0.343
Owner of dwelling	0.600	0.490	0.589	0.492
Live in a urban settlement	0.658	0.474	0.645	0.479
Lives in East Germany	0.278	0.448	0.210	0.407
Number of children	-	-	1.799	0.760
Education, Personality Traits and Association indices				
Husband's years of education	12.637	2.854	12.962	2.891
Wife's years of education	12.002	2.627	12.813	2.613
Education association index	0.606	0.298	0.600	0.293
Husband's Openness	4.345	1.200	4.283	1.142
Wife's Openness	4.487	1.209	4.498	1.209
Opennes association index	0.628	0.199	0.614	0.202
Husband's Conscientiousness	5.825	0.937	5.813	0.911
Wife's Conscientiousness	5.960	0.871	5.894	0.890
Conscientiousness association index	0.706	0.201	0.689	0.199
Husband's Extraversion	4.596	1.104	4.734	1.171
Wife's Extraversion	4.806	1.085	4.952	1.107
Extraversion association index	0.612	0.203	0.596	0.205
Husband's Agreeableness	5.186	0.991	5.088	1.015
Wife's Agreeableness	5.537	0.931	5.461	0.938
Agreeableness association index	0.663	0.196	0.647	0.200
Husband's Neuroticism	3.606	1.173	3.456	1.177
Wife's Neuroticism	4.144	1.231	4.084	1.213
Neuroticism association index	0.597	0.208	0.588	0.207
Observations	2512		1035	

Figure 1: Principal component analysis for the indicators of wealth: screen plot of eigenvalues
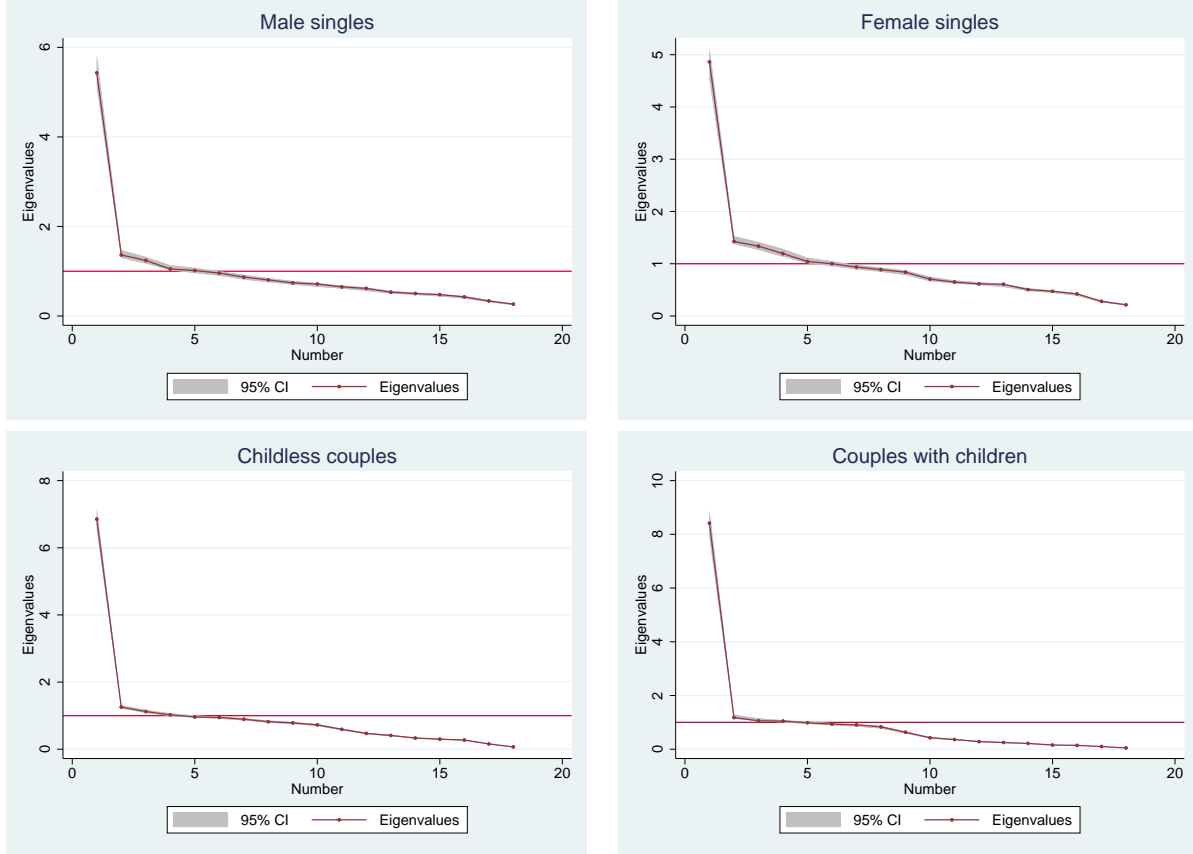
3.3 Measurement of personality traits and assortative mating

The Big Five personality traits –Mental Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism– are measured by the average points of three questions each on a 7-point scale (see Appendix B). Descriptive statistics of the Big Five personality traits are presented in the second part of Tables 1 and 2, while the distribution of each trait by gender is presented in Figures 2 and 3 for singles and couples, respectively. The average values are higher for the Conscientiousness trait and the Agreeableness trait at approximately 5.8 and 5.3, respectively, and lower for the Neuroticism trait, with values of less than 4. In general, the gender distributions are similar except that women show higher values for the Agreeableness trait (5.5 versus 5.2) and the Neuroticism trait (4 versus 3.5). Despite presenting the descriptive statistics of the variables here as recorded, to improve the comparability of the results, education and personality traits are standardized in the estimations to have a mean of 0 and standard deviation of 1.

Given the scope of this study, an important feature of personality traits is their stability across ages and life events as well as external and cyclical shocks. The stability of personality traits is a research question that has been debated at length among psychologists (Specht et al., 2014; Boyce et al., 2013; Specht et al., 2013; Lucas and Donnellan, 2011; Specht et al., 2011; Roberts and DelVecchio, 2000; Roberts, 1997) and more recently among economists as well (Cobb-Clark and

Figure 2: Densities of the Big Five personality traits for singles by gender
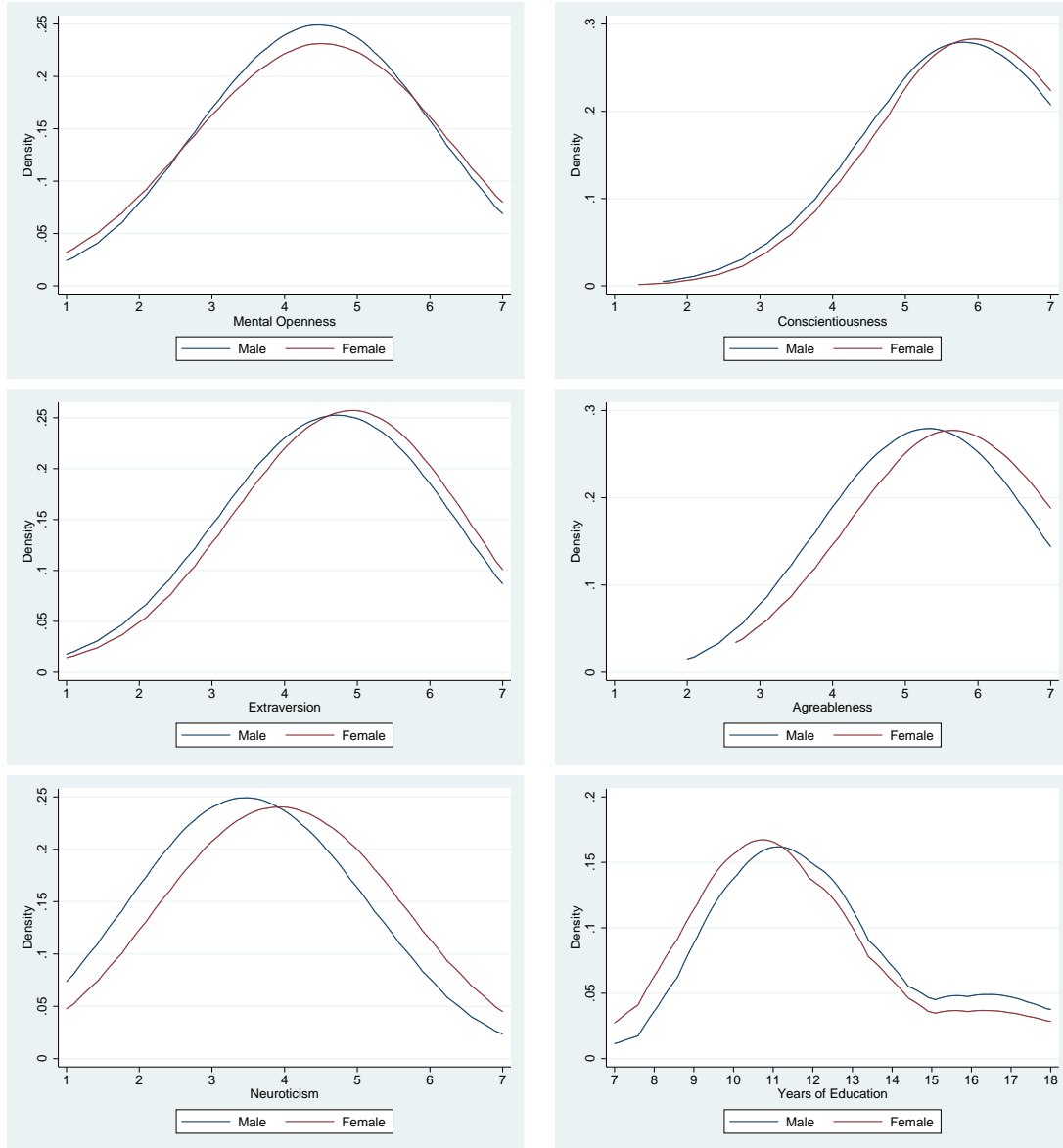
Schurer, 2012; Almlund et al., 2011; Borghans et al., 2008). To clarify different possible answers to this research question, the notion of change should be clearly defined. At the population level, at least two measures have been considered: mean-level changes and rank-order changes. "Mean-level change reflects shifts of group of people to higher or lower values on a trait over time" (Specht et al., 2011, pag. 863), while "rank order consistency reflects whether groups of people maintain their relative placement to each other on trait dimensions over time" (Specht et al., 2011, pag. 863). By adopting these two notions of stability, the literature has found that the most evident changes occur during adolescence and old age, while the degree of consistency is much higher during middle age (Specht et al., 2013; Lucas and Donnellan, 2011; Borghans et al., 2008; Fraley and Roberts, 2005; Caspi and Roberts, 2001; Roberts and DelVecchio, 2000).

Figure 3: Densities of the Big Five personality traits for couples by gender
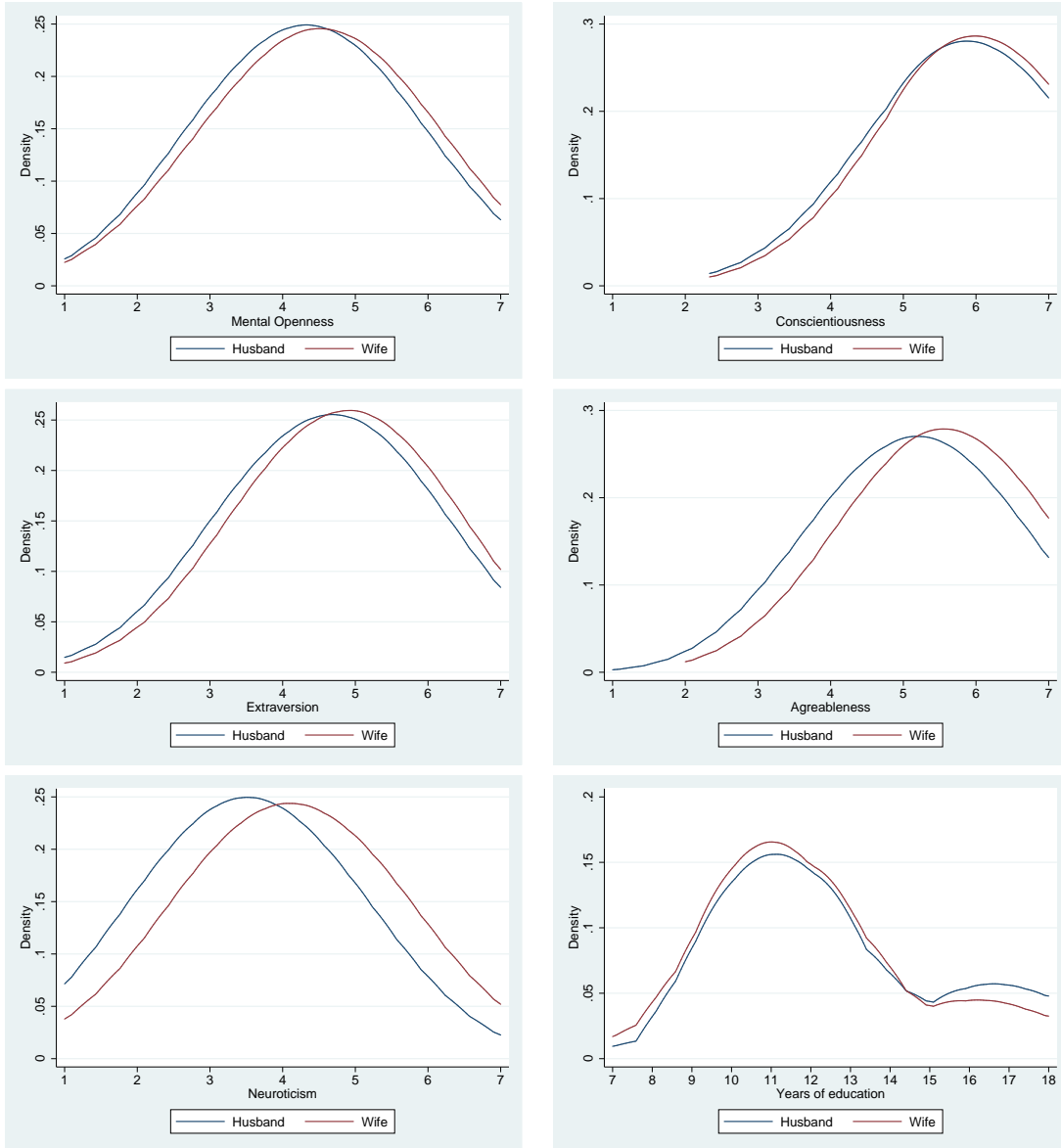
Given our research questions, we are interested in a third measure of personality trait stability: intraindividual changes. In contrast with population-level changes, intraindividual consistency assesses changes in the personality traits of each individual as he or she ages (Cobb-Clark and Schurer, 2012, page 12). In the framework of this study, intraindividual consistency matters for at least three reasons. First, considering that the 2010 SOEP collects information on consumption from 2009 and that information on personality traits was collected only in 2009, the knowledge that they are statistically stable supports the choice of matching the 2009 survey data with 2010 consumption information for individuals observed in both years. Second, even if we have information on the Big Five personality traits for only one year, our conclusions regarding their effects on consumption choices can be generalized without the concern that they depend on

13

the year of the data available and, in particular, that the year investigated in this study was characterized by negative economic trends. Third, we are able to compare the effect of personality traits on consumption for individuals who are potentially in different phases of their life cycle, i.e., when they are singles, in couples and in couples with children, without the concern that the change in status may affect the individual personality.

Table 3: Correlation coefficients for husband and wife personality traits, education and personal income

| | Husband | | | | | | |
Wife	Mental Openness	Coscientiousness	Extraversion	Agreeableness	Neuroticism	Education	Income
Mental Openness	0.2899*						
Coscientiousness	0.0761*	0.2837*					
Extraversion	0.0781*	0.1172*	0.0574*				
Agreeableness	0.0723*	0.1905*	0.0763*	0.2333*			
Neuroticism	-0.0224	-0.0897*	-0.0718*	-0.0725*	0.1227*		
Education	0.1629*	-0.0739*	0.0033	-0.0029	-0.1062*	0.5602*	
Income	0.0247	-0.0367	0.0037	-0.0128	0.0041	0.0459*	0.0866*

* : $p \leq 0.05$

The sample of couples confirms both the empirical evidence of positive assortative mating for the Mental Openness and the Conscientiousness traits (see e.g. Flinn et al., 2018; Lundberg, 2012) and the power of these two traits of predicting individuals' education level and wage. Education and wage are the two individual characteristics traditionally considered for positive assortative mating. To obtain a closer idea of the correlations between the personality traits, as well as education, of husband and wife, Table 2 reports the statistics of an association index, computed as $1/1+std.dev.(x)$, where x is a specific trait, and its standard deviation is computed with the household as a reference. When husband and wife have exactly the same trait, the standard deviation is 0 and the association index is 1; when the trait takes the two extreme values, 1 and 7, the association index takes the value 0.19. The highest association index, on average, is observed for the Conscientiousness trait, at approximately 0.7, followed by the Mental Openness and the Agreeableness traits, while the lowest is observed for the Neuroticism trait. A similar picture emerges in examining the correlation coefficients of husband and wife personality traits, summarized by Table 3, which also highlights the association between different traits, such as the Conscientiousness trait and the Agreeableness trait. It also shows that overall, there is a closer association in education than in personality traits, while the income association is quite low.[9] Figure 4 visually confirms that a certain level of assortative mating is observable for two personality traits, Mental Openness (as in Flinn et al., 2018, and Lundberg, 2012) and Conscientiousness (as in Lundberg, 2012).

---

[9]At variance with Flinn et al. (2018) and Lundberg (2012), for descriptive purposes, we analyze association in

Figure 4: Association of the Big Five personality traits for couples by gender
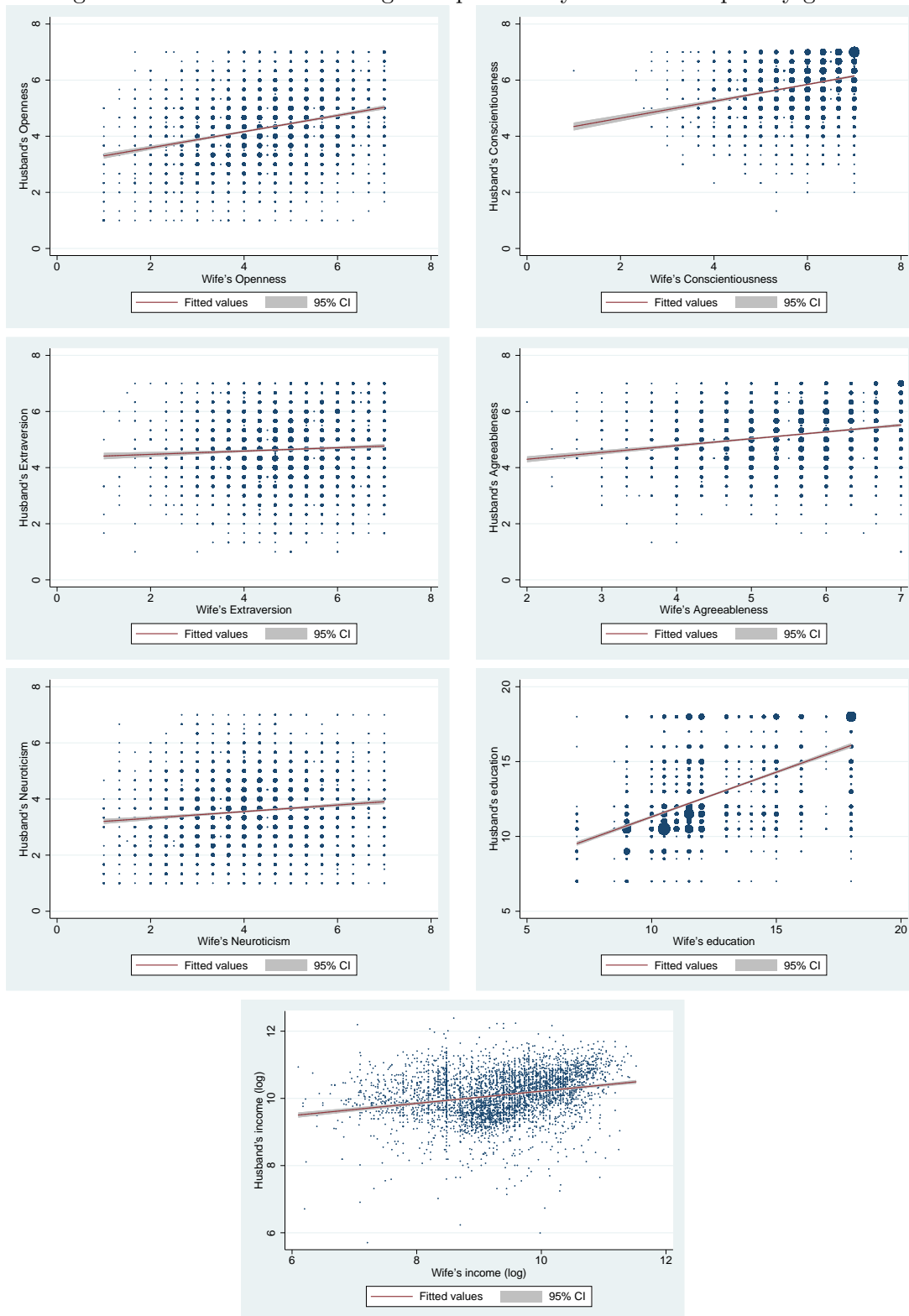
3.4 Other individual and family characteristics

The control variables, used in all specifications, are age and its square, being a part-time worker, being a full-time worker, being retired, and being an immigrant. For the samples of couples with and without children, all of these variables are provided for both the husband and the wife when relevant. Other household characteristics include the property status of the dwelling (1 if owner), whether the household is in a urban settlement, whether it is in East Germany, and the number of children.

An important aspect is the age selections in each sample. In particular, the samples of single and childless couples are composed mainly of relatively elderly people, although both contain a cluster of young people. For this reason, in each analysis, it is important to control for the age of the respondents and additionally for the retirement status. The sample of couples with children aged 16 or below is less problematic from this point of view, but we still control for age. In more detail, the sample of singles has a different composition when separated by gender: the majority of female singles are retired (57%), and only 37% of them work, either full-time (22%) or part-time (15%). The figures are different for single males, of whom 47% work full-time and 12% part-time, whereas 32% are retired. The difference in average age, about 10 years, is also quite relevant, leading to a significant difference in the education level, which is higher for males by 0.6 years. The proportion of immigrants is similar for males and females at about 5%. Given such a heterogeneous composition of the sample of singles, we decided not only to analyze consumption using the two samples of male singles and female singles but also to perform a specific robustness check by separating in the estimations those who are less than 60 years old from those who are more than 60 years old.

The sample of couples is also quite heterogeneous when those with and without children are considered separately: in the sample of childless couples, the average age of husbands and wives is higher by almost 22 years than that of the couples with children; the husband works full time in 82% of families with children, versus 34% of childless families, and the wife is less likely to work full-time when there are children, 16% vs 25%. In contrast, in families with children, the wife is much more likely to work part-time, 57% vs 21%, and as expected, the proportion of retired individuals is negligible, below 2% for both husbands and wives, versus 58 and 46%, respectively. In the sample of couples with children, being younger, both husband and wife have a higher level of education, with little difference between them. In contrast, in the sample of childless couples, a relevant difference exists between the education level of the spouses (about 0.6 years). Among couples with children, both parents are much more likely to be immigrants (about 12-13% vs about 7%). The sample of couples with children aged 16 or below has on average 1.8 children, 49% of whom are girls.

3.5 Engel curves specification

The use of Engel curves to study consumption when no price information is available dates back to Engel (1857), and they have been applied countless times in economics since then. In this

study, we apply the quadratic budget share specification of Engel curves proposed by Banks et al. (1997), incorporating observed heterogeneity as linear demographic translating functions (Lewbel, 1985; Pollak and Wales, 1981; Gorman, 1976).[10] With this specification, we estimate both the probability of consuming different commodities and their share of total expenditure on consumption. We thus specify two different consumption models:

$$o_{ij} = \alpha_j + \lambda_j \mathbf{d}_i + \sum_{x=1}^{2} \beta_j^{(x)} \left(\ln y_i\right)^x + u_{ij} , \tag{1}$$

$$w_{ij} = \alpha_j + \lambda_j \mathbf{d}_i + \sum_{x=1}^{2} \beta_j^{(x)} \left(\ln y_i\right)^x + v_{ij} , \tag{2}$$

where o_{ij} and w_{ij} are the probability of non zero consumption and the budget share of the jth commodity category for individual i, respectively; coefficients $\beta_j^{(x)}$ capture the effect of the log of total expenditure $\ln y$ on the share of household expenditure spent on commodity j; and $\mathbf{d}$ is a set of demographic variables whose impact on consumption is captured by shifting parameters λ_j, which capture how demographic characteristics shape preferences for the consumption of a specific commodity j. The Big Five personality traits are included among demographic variables $\mathbf{d}$ together with other control variables used to capture preferences heterogeneity. In particular, for couples, we specify personality traits in two alternative sets of variables: (i) individual traits of husband and wife separately and (ii) the average trait and the association index (see Section 3.3) of the couple.

Given the possible concern about endogeneity of total household expenditure, instead of the standard instrumental variables method, which in nonlinear models is biased and inconsistent (Terza et al., 2008), the control function approach is used for both equation (1) and (2). The control function approach is a two-step procedure: in the first stage, total expenditure is regressed on the same set of covariates as in the main model plus the exclusion restrictions. As established in the literature, as exclusion restrictions, we use individual income from work and pension and the first three components of a principal component analysis on ownership of a number of items (detailed in the previous section), which can be interpreted as composite indices for household wealth. The first-stage equation can be formalized as follows:

$$\ln y_{ij} = \alpha_j + \lambda_j \mathbf{d}_i + \gamma_j \mathbf{z}_i + \epsilon_{ij} ,$$

In the second stage, the prediction of the idiosyncratic component of the first stage $\hat{\epsilon}_{ij}$ is included as an additional regressor in equations (1) and (2) .

$$o_{ij} = \alpha_j + \lambda_j \mathbf{d}_i + \sum_{x=1}^{2} \beta_j^{(x)} \left(\ln y_i\right)^x + \eta_j \hat{\epsilon}_{ij} + u_{ij} , \tag{3}$$

---

[10] While more general demographic transformations exist, and typically produce better fit, we chose the simplest for ease of estimation and interpretation of the results.

$$w_{ij} = \alpha_j + \lambda_j \mathbf{d}_i + \sum_{x=1}^{2} \beta_{ij}^{(x)} (\ln y_i)^x + \eta_j \hat{\epsilon}_{ij} + v_{ij} \; , \tag{4}$$

Equations (3) are estimated using a logit model with indepedent equations for each commodity; however, the Engel curves system specified in equation (4) is estimated by means of seemingly unrelated regressions, allowing for correlation of the error terms.

While the parameters λ_j of the translating functions can be straightforwardly interpreted as consumption shifters or preference parameters (Lewbel, 1985),[11] the information contained in the total expenditure parameters of the Engel curves can be effectively synthesized by computing income elasticities, which return the percentage increase in expenditure on commodity j if total expenditure y increases by 1%. Formally, the income elasticities are defined as follows:

$$\eta_j = \frac{\partial e_j}{\partial y} \frac{y}{e_j} = \frac{\partial y w_j}{\partial y} \frac{y}{y w_j} = 1 + \frac{\partial w_j}{\partial y} \frac{y}{w_j} \; ,$$

where e_j is expenditure on commodity j, and the structure of equation (2) permits translating the coefficients into income elasticities as follows:

$$\eta_j = 1 + \frac{1}{w_j} \sum_{x=1}^{2} x \beta_j^{(x)} (\ln y)^{x-1} \; .$$

4   Results and discussion

In the Engel curves estimation, standardized personality traits (and education level) are included as shifting parameters, allowing us to capture how these individuals' characteristics may change the level of the budget share devoted to each category of expenditure (see Equation 4). To make the comparison of the effects of the same trait across different household compositions easier, the coefficients of each trait are shown in a single table with household types by column. In particular, Table 4 reports the R^2 goodness of fit statistics, and tables from 5 to 10 show the coefficients of the Big Five personality traits and education level obtained separately from the estimations of the system of Engel curves in equation 4 for the samples of single men, single women, women and men in childless couples, and women and men in couples with children.[12]

In Table 4, the R^2 statistics are reported for each consumption category and sample selection of the restricted and unrestricted specifications. The restricted model excludes personality traits from the list of exogenous variables. In this way, we test the contribution of the Big Five personality traits to the explanatory power of the Engel curves specification. Generally, the results confirm the role of personality traits in shaping consumption preferences and explaining a relevant aspect of the unobserved heterogeneity in the restricted model. While personality traits on average improve the R^2 by about 15.7%, Table 4 highlights substantial heterogeneity in their

---

[11]For instance, considering any good j, a positive parameter associated with a personality trait implies that people characterized by a stronger trait also have stronger preferences for good j.

[12]Full estimation tables are available upon request.

Table 4: System of Engel curves: goodness of fit

Consumption category	Single men R^2	% diff.	Single women R^2	% diff.	Childless couples R^2	% diff.	Couples w/ch. R^2	% diff.
Food at home	0.392		0.397		0.392		0.397	
- with PTs	0.397	1.4%	0.403	1.4%	0.397	1.1%	0.410	3.3%
Food out of the home	0.073		0.122		0.081		0.058	
- with PTs	0.082	13.0%	0.129	6.0%	0.090	10.2%	0.083	42.2%
Clothing/shoes	0.039		0.033		0.011		0.022	
- with PTs	0.046	16.3%	0.037	12.9%	0.014	28.3%	0.044	96.4%
Personal hygiene	0.076		0.061		0.055		0.046	
- with PTs	0.090	18.8%	0.062	2.0%	0.061	11.1%	0.059	30.0%
Health	0.085		0.078		0.102		0.031	
- with PTs	0.102	20.1%	0.092	17.9%	0.112	9.4%	0.038	19.8%
Telecomunications	0.172		0.258		0.189		0.243	
- with PTs	0.189	9.8%	0.264	2.1%	0.197	4.1%	0.251	3.3%
Education	0.092		0.148		0.122		0.102	
- with PTs	0.096	4.9%	0.149	1.1%	0.128	4.5%	0.119	16.7%
Culture	0.131		0.137		0.113		0.045	
- with PTs	0.166	26.3%	0.165	20.5%	0.131	16.1%	0.066	48.5%
Leisure time	0.022		0.048		0.031		0.064	
- with PTs	0.028	23.9%	0.055	13.9%	0.039	25.9%	0.090	40.6%
Vacations	0.210		0.222		0.154		0.172	
- with PTs	0.214	1.8%	0.225	1.3%	0.161	4.5%	0.179	3.8%
Insurance	0.142		0.175		0.174		0.080	
- with PTs	0.146	2.5%	0.179	1.9%	0.177	1.3%	0.097	21.6%
Transportation	0.046		0.106		0.048		0.033	
- with PTs	0.103	11.5%	0.114	7.4%	0.053	10.5%	0.053	61.7%

Note: for each consumption category, the first row show the R^2 of an estimation that include the following control variables: age, age-squared, being immigrant, working part-time, working full-time, being retired, years of education, being owner of the dwelling, living in an urban settlement and living in East-Germany. For couples with children, number of children is also included. The second row also includes the Big-Five personality traits as additional regressors.

explanatory power, both by sample selection and by consumption category. For example, for singles, personality traits are particularly relevant to explain health, culture and leisure expenditures (with an R^2 that increases by about 20%), while small improvements are observed for food at home, vacations and insurance. Gender heterogeneity also matters, as personality traits improve the estimation of personal hygiene by almost 19% for single men but only by 2% for single women. For childless couples, personality traits are particularly relevant to explain clothing and leisure expenditures (with an increase of more than 25%), while for couples with children, they improve the R^2 by far more than 15% for all consumption categories except food at home, telecommunications and vacations. Particularly large R^2 increases are found for clothing (96%), culture (almost 49%) and transportation (almost 62%). These results suggest that accounting for personality in the consumption analysis captures a larger portion of consumers' preferences than more standard approaches do.

Regarding the coefficients of the Big Five personality traits and education level, a first interesting result pertains to the individuals who score high in the Mental Openness trait, i.e., those

Table 5: System of Engel curves: Mental Openness

Consumption category	Singles		Childless couples		Couples w/ch.	
	Men	Women	Men	Women	Men	Women
Food at home	-0.008	-0.009*	-0.001	-0.002	0.002	0.001
Food out of the home	0.001	0.003	0.002	0.001	0.004**	-0.004**
Clothing/shoes	0.000	0.000	0.000	0.000	-0.001	0.002
Personal hygiene	0.002	0.001	0.000	0.001	0.000	0.000
Health	-0.001	0.000	-0.002*	0.000	0.000	0.000
Telecomunications	0.004*	0.001	0.001	0.001*	0.000	0.001
Education	0.002	0.001	0.001***	0.001	0.002	0.004
Culture	0.004***	0.003***	0.002***	0.001**	0.000	0.002*
Leisure time	0.002	0.002	0.002	0.001	0.003**	0.002
Vacations	-0.004	-0.003	-0.004	-0.002	0.004	-0.006
Insurance	-0.003	0.000	-0.002	-0.001	-0.004	-0.002
Transportation	0.003	0.001	0.000	0.001	-0.008***	0.000

Note: estimation also include the following control variables, not reported in the table: age, age-squared, being immigrant, working part-time, working full-time, being retired, years of education, being owner of the dwelling, living in an urban settlement and living in East-Germany. For couples with children, number of children is also included. Full estimation tables are available upon request. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 6: System of Engel curves: Education

Consumption category	Singles		Childless couples		Couples w/ch.	
	Men	Women	Men	Women	Men	Women
Food at home	0.026***	0.009	0.004	-0.002	0.001	0.004
Food out of the home	0.004	0.000	0.004	0.001	-0.002	-0.001
Clothing/shoes	0.001	0.000	0.003	0.001	0.003	-0.002
Personal hygiene	0.000	0.001	-0.001	-0.001	0.000	0.000
Health	-0.002	0.007*	0.001	0.000	-0.001	-0.002*
Telecomunications	-0.010***	-0.006***	-0.001	0.000	-0.006**	-0.003*
Education	0.007***	0.006***	0.004***	0.002***	0.004	0.000
Culture	0.003***	0.004***	0.003***	0.002***	0.000	-0.001
Leisure time	-0.003	-0.003	-0.005**	0.001	-0.004	-0.004
Vacations	-0.005	0.002	0.000	0.000	0.015*	0.010
Insurance	-0.011	-0.019***	-0.001	-0.003	-0.018*	-0.009
Transportation	-0.009	-0.004	-0.002	-0.004*	0.001	0.004

Note: estimation also include the following control variables, not reported in the table: age, age-squared, being immigrant, working part-time, working full-time, being retired, years of education, being owner of the dwelling, living in an urban settlement and living in East-Germany. For couples with children, number of children is also included. Full estimation tables are available upon request. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

who are more curious, intelligent, and unconventional, who show a higher share of budget devoted to expenditure on culture (see Table 5). This finding is verified for single men and single women, for both the male and the female component of childless couples, and for the female partners of couples with children. In the case of male partners in childless couples, the coefficient is also positive and statistically significant for expenditure on education. An examination of the impact of the Mental Openness trait on the probability of non-zero consumption, as expressed by equation (3), reported in Appendix C, Table C.3, indicates that this effect is even stronger because it includes a positive and statistically significant coefficient not only for culture but also for a companion type of expenditure, i.e., on education, which is verified for all types of household in which the individual can potentially live.

In terms of magnitude of effect, expenditure for culture has a relatively small share of the budget, constituting between 1 and 1.5% of the total expenditure of the households analyzed here (see Tables 1 and 2). For singles, one standard deviation increase in the Mental Openness trait increases the budget share devoted to culture by 0.35 percentage points, i.e., a 25% increase in culture expenditure. The marginal effect of the probit estimation results in a coefficient for the Mental Openness trait, as an example for single men, of 0.041, meaning that an increase of 1 standard deviation in the trait is predicted to increase the probability of spending on this item by 4.1 percentage points (see Tables C.3 and C.4).

Regarding the interpretation, we should first consider that the Mental Openness trait has one of the higher correlation coefficients in the couple, i.e., is one of the traits with higher positive assortative mating (see Table 3). Then, we can argue that agreement between the partners on using household resources for consumption related to culture is highly probable, or we may expect that the joint consumption of these goods is a potential candidate for explaining the marital surplus of couples in which both partners share this trait of personality. This interpretation is reinforced by examining the Mental Openness trait score average in the couple instead of the personality score of each partner (see Table D.2). In fact, when the average score is considered, the coefficients are statistically significant for both culture and education items and for both couples with children and childless couples. The effect is, instead, not statistically significant when the association index is considered. In other words, the effect is not verified when both partners have the same trait, low or high, in comparison with partners who score differently in the trait; in addition, the effect is statistically significant when both are high in the trait in comparison to partners who both score low in it.

In examining the Mental Openness trait, a final remark emerges from our analysis regarding the very similar effects on consumption of education level (see Table 6). The coefficients of the education level variable for both the culture and the education shares of the budget are positive and statistically significant for both male and female singles, and they persist when childless couples are considered. This finding is confirmed in examining the average of the trait in childless couples (see Table D.1). Similar evidence emerges if we examine the probability of nonzero consumption (see Table C.1), with marginal effects similar to those of the Mental Openness trait (see Tables

Table 7: System of Engel curves: Conscientiousness

Consumption category	Singles		Childless couples		Couples w/ch.	
	Men	Women	Men	Women	Men	Women
Food at home	0.010*	0.006	0.002	0.002	0.013***	0.003
Food out of the home	-0.002	-0.004**	-0.001	-0.001	-0.001	-0.001
Clothing/shoes	-0.003	0.000	0.000	-0.001	0.003	-0.002
Personal hygiene	0.001	0.000	0.000	0.001	0.001	0.001
Health	0.001	-0.001	-0.001	0.000	0.000	0.000
Telecomunications	-0.003	0.000	0.001	-0.001*	-0.001	0.001
Education	-0.001	0.001	0.000	0.000	0.000	0.001
Culture	-0.002**	0.000	0.000	0.000	-0.001	0.000
Leisure time	-0.002	0.000	-0.001	-0.001	-0.004	0.003
Vacations	-0.002	-0.002	-0.001	0.003	-0.001	-0.004
Insurance	0.002	0.002	-0.003	0.003	-0.007	-0.003
Transportation	0.004	-0.003	0.001	-0.002	-0.003	0.002

Note: estimation also include the following control variables, not reported in the table: age, age-squared, being immigrant, working part-time, working full-time, being retired, years of education, being owner of the dwelling, living in an urban settlement and living in East-Germany. For couples with children, number of children is also included. Full estimation tables are available upon request.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 8: System of Engel curves: Extraversion

Consumption category	Singles		Childless couples		Couples w/ch.	
	Men	Women	Men	Women	Men	Women
Food at home	0.012**	0.014***	-0.004	0.001	-0.001	0.006
Food out of the home	0.008**	-0.001	0.002	0.002	0.001	0.002
Clothing/shoes	0.004	0.001	0.001	0.000	0.004*	-0.001
Personal hygiene	0.002*	0.001	0.000	0.000	0.001	0.002
Health	-0.002	-0.001	0.002	-0.002	0.000	0.000
Telecomunications	0.001	0.000	0.001	0.001	0.001	0.000
Education	0.001	0.001	0.000	-0.001	0.001	-0.002
Culture	0.001	0.000	0.000	0.000	0.000	0.000
Leisure time	0.000	-0.001	0.000	-0.002*	-0.001	-0.001
Vacations	-0.004	-0.003	0.000	0.005	0.004	0.006
Insurance	-0.010**	-0.007**	-0.001	0.001	-0.007	-0.010**
Transportation	-0.013***	-0.008***	0.000	-0.002	0.000	-0.001

Note: estimation also include the following control variables, not reported in the table: age, age-squared, being immigrant, working part-time, working full-time, being retired, years of education, being owner of the dwelling, living in an urban settlement and living in East-Germany. For couples with children, number of children is also included. Full estimation tables are available upon request.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Our interpretation begins again by considering the correlation coefficient of male and female education levels in the couple, which is the highest among those considered, with the Mental Openness trait being second in magnitude (see Table 3). Furthermore, as we have underlined in Section 2.1, the Mental Openness trait and the Conscientiousness trait are the two individual features that best predict an individual's educational outcomes. From these premises, two contrasting hypotheses emerge: the first is that the positive assortative mating on the Mental Openness trait, and then its predictive power for expenditure on education and culture, can be considered a type of prior effect with respect to education level. In other words, two individuals who score high in the Mental Openness trait are predicted to have a high education level, or to choose a demanding school career; then, they will have a high probability of becoming partners in the marriage market and devoting relatively higher shares of their budget to consuming items classified as culture or education. The contrasting hypothesis is that the Mental Openness trait generates positive assortative mating and also predicts preferences for expenditure on education and culture, but the latter effect is not necessarily mediated by the level of education. To test these two hypotheses, as a robustness check, we separate singles with a secondary education from those who do not have this level and also separate households in which least one spouse has a secondary education from those in which neither spouse has a secondary education. As illustrated in the next section, this check supports the second hypothesis, i.e., that the effect of the psychological trait is independent from that of the education level (see Table F.1 and F.2).

Table 7 shows the coefficients of the Conscientiousness trait estimated for the four systems of Engels curves for single men, single women, and couples with and without children. In comparison with the Mental Openness trait, the Conscientiousness trait affects consumption in a more gender-specific way. For instance, there is a negative effect on expenditure on culture, but only for single men. Regarding the probability of consuming, highly conscientious single men and women are predicted to have a lower probability of consuming culture and vacations, but the effect tends to disappear in couples except for women in childless couples (see Table C.5). In addition, in contrast to our observations for the Mental Openness trait, in this case, the effect on consumption is imputable to the association of partners instead of to the average trait in the couple (see the results for childless couples in Table D.3). Considering that the Conscientiousness trait is the third most relevant in terms of positive assortative mating, after the education level and the Mental Openness trait (see Table 3), we may interpret this finding as another example of similarities in consumption that can potentially generate a marital surplus. Of course, in this case, the marital surplus is generated by the agreement between the partners in reducing the consumption of these items rather than by increased consumption or a public good joint consumption.

Another gender-specific effect of the Conscientiousness trait is detectable in examining the shares of the budget devoted to food at home in comparison with the shares of the budget for the consumption of food out of the home. The share of the budget for food at home is higher both for the most conscientious single men and for the male partners of couples with children (see

Table 9: System of Engel curves: Agreeableness

Consumption category	Singles		Childless couples		Couples w/ch.	
	Men	Women	Men	Women	Men	Women
Food at home	-0.008	0.011**	0.002	0.003	-0.008*	0.008*
Food out of the home	-0.001	-0.001	-0.001	-0.002**	0.001	0.002
Clothing/shoes	0.002	-0.003	0.000	0.000	-0.001	-0.002
Personal hygiene	0.001	-0.002	-0.001	0.001	0.000	-0.001
Health	-0.001	0.001	0.000	0.001	0.001	0.000
Telecomunications	0.003	-0.002	0.000	0.000	0.001	-0.001
Education	0.000	0.000	0.000	0.000	0.003*	0.001
Culture	0.001	0.000	-0.001*	0.000	0.000	-0.001
Leisure time	-0.001	-0.004**	-0.002	0.000	0.003	-0.004
Vacations	0.003	-0.004	-0.001	0.000	-0.002	0.003
Insurance	0.001	-0.001	0.002	-0.002	0.006	-0.003
Transportation	-0.003	0.003	0.003	0.000	0.000	-0.003

Note: estimation also include the following control variables, not reported in the table: age, age-squared, being immigrant, working part-time, working full-time, being retired, years of education, being owner of the dwelling, living in an urban settlement and living in East-Germany. For couples with children, number of children is are also included. Full estimation tables are available upon request.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 10: System of Engel curves: Neuroticism

Consumption category	Singles		Childless couples		Couples w/ch.	
	Men	Women	Men	Women	Men	Women
Food at home	-0.006	0.004	0.002	0.001	0.000	0.005
Food out of the home	-0.004	-0.003	0.000	-0.002**	-0.001	0.001
Clothing/shoes	-0.001	-0.002	-0.003**	-0.001	0.000	-0.005**
Personal hygiene	0.003**	0.000	-0.002**	0.001	0.001	0.000
Health	0.006***	0.006***	0.001	0.004***	0.001*	0.000
Telecomunications	0.005**	0.003**	-0.001	0.001	0.001	0.000
Education	0.001	0.002	0.000	-0.001	-0.001	0.000
Culture	0.000	-0.001	-0.001**	0.000	0.000	0.000
Leisure time	-0.004	-0.002	-0.001	-0.002**	-0.001	0.000
Vacations	-0.005	-0.006**	-0.002	-0.005*	-0.002	-0.001
Insurance	0.000	0.000	0.002	-0.002	-0.002	-0.010**
Transportation	0.003	-0.005**	0.003	0.004**	0.000	0.004

Note: estimation also include the following control variables, not reported in the table: age, age-squared, being immigrant, working part-time, working full-time, being retired, years of education, being owner of the dwelling, living in an urban settlement and living in East-Germany. For couples with children, number of children is also included. Full estimation tables are available upon request.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 7). In contrast, we verified that for women –and in particular for those who are single– the Conscientiousness trait has a negative and statistically significant coefficient for food out of the home. In the latter case, the sign is confirmed by the probit estimation of the nonzero probability of consuming (see Table C.5). In terms of magnitude, consider that the share of the budget of a single women devoted to this item is 5.7%; thus, an increase of one standard deviation in her Conscientiousness trait reduces consumption of this item by 1.3% (see Table C.6). When individuals must exert self-discipline in reducing consumption, women moderate their expenditures for food out of the home, while men increase their propensity to consume food at home when they are either single or in a family with children. Regarding the latter outcome, in couples with children, the male preference seems to be so strong as to remain statistically significant when the couple average score is taken into account (see Table D.3).

Expenditure on food at home is also affected by the Extraversion trait. Men and women who are high in this trait, and thus are forthcoming and desire social relationships, are relatively more prone to devoting high shares of their budget to food at home, probably because they invite their friends to their home (see Table 8). For women, this interpretation is reinforced by the effect of the Agreeableness trait, which positively predicts a higher budget share of this item if they are single or in households with children (see Table 9). The aforementioned interpretation is also applicable to explain the positive and statistically significant effect in terms of the probability of the nonzero consumption of food at home for the sample of childless couples when both score high in the Extraversion trait (see Table C.7). The interplay between the Extraversion and Agreeableness traits in shaping the consumption of food –at home vs. out of the home– is also detectable in the predictive power of the average of the two traits in childless couples: the former predicts a higher share of the budget for dining out, while the latter predicts a lower share for this kind of consumption choice (see Table D.5 and Table D.4).

Finally, the Neuroticism trait plays a role in increasing both the shares of the expenditure and the probability of nonzero consumption of health quite consistently across gender and household composition (see Table 10 and Table C.11); this finding is confirmed in examining the average trait in childless couples (see Table D.6). As this trait is a measure of an individual's tendency to be emotionally unstable and inclined to worry, it is easily understandable that this feature leads to increased expenditures on health.

Table 11 reports income elasticities for the twelve categories of expenditures included in the Engel curves systems estimated here. Only a quite small number of categories of consumption show large differences in elasticities for men and women or according to household type. For example, food out of the home has an elasticity greater than one for two samples: single women and couples with children. In these cases, an increase of 1% in income returns an increase in expenditure on food out of the home of more than 1%. The same is true for the expenditure on clothing and shoes: the elasticities are greater than one for women and couples with children. Single men show an elasticity greater than one for health and telecommunications, with the former also being greater than one for couples with children. Furthermore, there is a group of items,

Table 11: System of Engel curves: Elasticities

Consumption category	Single men	Single women	Childless couples	Couples w/ch.
Food at home	0.139	0.305	0.381	0.063
Food out of the home	0.980	1.230	0.978	1.255
Clothing/shoes	0.796	1.181	0.865	1.120
Personal hygiene	0.686	0.806	0.895	0.942
Health	1.073	0.247	0.738	1.627
Telecomunications	1.449	0.949	0.641	1.168
Education	0.355	0.671	0.300	0.319
Culture	1.362	1.434	1.161	1.228
Leisure time	1.278	1.549	1.522	2.291
Vacations	2.681	2.684	1.991	0.895
Insurance	1.878	1.803	1.116	2.525
Transportation	1.986	1.532	1.547	1.165

mainly related to leisure time –namely culture, leisure and vacations– for which elasticities are greater than one for all the samples of our study even when differences in magnitude exist: for both single men and women, the elasticities are almost 2.7, while for childless couples, they are just shy of 2. The only exception is the expenditures on vacations for couples with children at 0.68. A similar pattern is detectable for expenditures on insurance and transportation, for which elasticities are greater than one for all of our samples. Regarding the expenditure on insurance, we find a plausible effect of the transition from one-person households to couples, as the decrease in the magnitude of the elasticity is an expected result owing to the couple formation being a first way to be insured.

4.1 Robustness and heterogeneity analysis

In order to consider the heterogeneous composition in terms of age, whether in the samples of singles or of childless couples, as a first robustness check, we separate in the estimations those who are less than 60 years old from those who are more than 60 years old. The positive effect of the Mental Openness trait on the share of budget devoted to culture still holds, whether for singles or childless couples (see Table E.1 and Table E.4). In contrast, the negative effect of the Conscientiousness trait on expenditure on culture is confirmed only for young singles and is not true for young childless couples or elderly singles and childless couples (see Table E.2 and Table E.5). A confirmed outcome, independent of the selection by age of the estimation sample, is the positive effect of the Neuroticism trait on expenditures on health (see Table E.6 and Table E.3).[13]

As a second robustness check, we separate in the estimations the singles with a secondary education from those who do not have this level and also separate households where at least one spouse has a secondary education from households where neither spouse has a secondary education. This check allows us to verify whether the effect of the Mental Openness trait on

---

[13]Estimation outcomes for the other traits are available upon request.

expenditure on culture is driven mainly by individuals with a relatively high level of education or whether it is also detectable for individuals with a lower level of education. As Tables F.1 and F.2 show, the predictive power of this personality trait is confirmed for all typologies of households independent of the level of education, as it is also true for the sample of individuals with a lower level of education.[14]

These results confirm the importance of accounting for personality traits when analyzing consumption choices: their contribution to explaining consumption preference does not stem uniquely from their association with educational achievements. Rather, the similar impact of personality on the consumption of individuals with higher and lower levels of education suggests that the education level is a poor proxy of personality, and more specifically of the Mental Openness trait, in consumption studies.

5 Conclusions

In this study, we have analyzed the role played by personality traits in consumption decisions for both individuals and households. Our investigation is based on the estimation of a system of Engel curves and probit equations for single men, single women, men and women in childless couples and men and women in couples with children, with each group considered separately. We show that personality traits are relevant predictors of household expenditure and participation in consumption of several categories of goods and services. The inclusion of personality traits among demographic shifters helps to reduce unobserved heterogeneity and improves the goodness of fit of the Engel curves specification. These results suggest that accounting for personality in consumption analysis captures a larger portion of consumers' preferences than more standard approaches do.

A key contribution of the paper is the test of which traits are consistent between the consumption choices of people living alone and in couples. Given this kind of evidence and taking into account assortative mating on personality traits, we are able to characterize the marital surplus based on joint consumption or on the agreement to reduce/increase the share of the budget devoted to certain items. For example, we find that the expenditure on culture (and its probability of nonzero consumption) is higher for men and women who score high in the Mental Openness trait. This is true for men and women not only when living alone but also when living as a couple without children. Furthermore, this finding remains true for couples with children, even if only in terms of consumption probability and not of the budget share. Considering that the Mental Openness trait has a large correlation coefficient in the couple (it is the personality trait with the highest positive assortative mating), we conclude that the joint consumption of culture is a potential candidate to explain the marital surplus in couples where both partners score high in the Mental Openness trait. A robustness analysis allows us to show that this effect is not entirely due to the level of education of the partners: by separating the estimations for couples

---

[14]Estimation outcomes for the other traits are available upon request.

with at least one person with a secondary education from those in which neither spouse has this level, we find that the predictive power of personality is independent of the education level of the partners. We therefore conclude that the Mental Openness trait not only is a sort of antecedent of the education level but also generates positive assortative mating and increases consumption expenditure on culture independently of the education level of the partners.

Furthermore, we show that the probability of spending money on leisure time, vacations and culture is lower for individuals who score high in the Conscientiousness trait. As this behavior is common among singles –men and women– and in both husband and wife of couples with children, and considering that the Conscientiousness trait is the second most relevant in terms of positive assortative mating, we interpret this finding as another example of joint consumption that can generate a marital surplus. In this case, the agreement between the partners does not imply an increase in the probability of consuming certain items; instead, it represents a decrease in the resources devoted to these items. All of the income elasticities are greater than 1, which is evidence that this group of items is particularly sensible to income fluctuations to which conscientious individuals are adverse.

Regarding the share of food, which is the most relevant in terms of size, we find statistically significant effects for two personality traits, Conscientiousness and Extraversion. Conscientious single men, as well as the male partners in couples with children, tend to spend more on food at home, as do men and women who are high in the Extraversion trait. The most conscientious women –in particular those who are singles– tend to spend less for food out of the home.

We conclude with a caveat: our analysis is to some extent limited by the simplified model of household decision making adopted for couples. In fact, we assume that households are maximizing a single utility function because we are unable to explicitly differentiate partners' preferences within a couple using individual utility functions or to model any kind of strategic interaction between the two.[15] Nonetheless, we assume that the individual personality traits, as well as other individual characteristics, of both partners can have different impacts on household utility. Consequently, we are able to test whether two partners who score high –or low– in a certain trait are predicted to allocate the household budget in a certain way, and whether this budget allocation is similar to that of women and men who score similarly and live alone. In the affirmative case, we infer that personality affects consumption similarly when individuals are single or live in a couple. We cannot infer much more because i) in our sample, people are not the same individuals changing their status from single to married, and ii) we do not account for partners' individual utility functions in modeling the household decision-making process. Given the relevance of the household decision-making process in the economics literature, as well as the usefulness of personality traits for understanding household labor supply (as shown e.g. by Flinn et al., 2018) and consumption decisions, further insights into this issue remain for future research.

---

[15]Further insights on these aspects could be analyzed by means of collective consumption models, such as Browning et al. (1994), Menon et al. (2018) or Mangiavacchi et al. (2018), but data limitations prevented us from estimating such models in the current analysis.

References

Almlund, M., A. L. Duckworth, J. J. Heckman, and T. D. Kautz (2011). Personality psychology and economics. Technical report, National Bureau of Economic Research. 2, 5, 12

Banks, J., R. Blundell, and A. Lewbel (1997). Quadratic Engel curves and consumer demand. *The Review of Economics and Statistics 79*(4), 527–39. 17

Becker, G. S. (1973). A Theory of Marriage: Part I. *Journal of Political Economy 81*(4), 813–846. 2, 5, 6

Becker, G. S. (1981). Altruism in the family and selfishness in the market place. *Economica 48*(189), 1–15. 2

Borghans, L., A. L. Duckworth, J. J. Heckman, and B. Ter Weel (2008). The economics and psychology of personality traits. *Journal of Human Resources 43*(4), 972–1059. 2, 5, 12

Bowles, S., H. Gintis, and M. Osborne (2001a). Incentive-enhancing preferences: Personality, behavior, and earnings. *American Economic Review 91*(2), 155–158. 4

Bowles, S., H. Gintis, and M. Osborne (2001b). The determinants of earnings: A behavioral approach. *Journal of Economic Literature 39*(4), 1137–1176. 2, 4

Boyce, C. J. and A. M. Wood (2011). Personality prior to disability determines adaptation: Agreeable individuals recover lost life satisfaction faster and more completely. *Psychological Science 22*(11), 1397–1402. 2

Boyce, C. J., A. M. Wood, and N. Powdthavee (2013). Is personality fixed? Personality changes as much as "variable" economic factors and more strongly predicts changes to life satisfaction. *Social Indicators Research 111*(1), 287–305. 11

Brown, S. and K. Taylor (2014). Household finances and the 'Big Five'personality traits. *Journal of Economic Psychology 45*, 197–212. 2, 5

Browning, M., F. Bourguignon, P. A. Chiappori, and V. Lechene (1994). Income and outcomes: a structural model of intrahousehold allocation. *Journal of Political Economy 102*(6), 1067–1096. 28

Bucciol, A. and L. Zarri (2017). Do personality traits influence investors' portfolios? *Journal of Behavioral and Experimental Economics 68*, 1–12. 2, 5

Caliendo, M., F. Fossen, and A. S. Kritikos (2014). Personality characteristics and the decisions to become and stay self-employed. *Small Business Economics 42*(4), 787–814. 2, 5

Caliendo, M., S. Künn, and M. Weißenberger (2016). Personality traits and the evaluation of start-up subsidies. *European Economic Review 86*, 87–108. 2

Carpenter, J. (2016). The labor supply of fixed-wage workers: estimates from a real effort experiment. *European Economic Review 89*, 85–95. 4

Caspi, A. and B. W. Roberts (2001). Personality development across the life course: The argument for change and continuity. *Psychological Inquiry 12*(2), 49–66. 12

Cobb-Clark, D. A. and S. Schurer (2012). The stability of big-five personality traits. *Economics Letters 115*(1), 11–15. 11, 13

Conlin, A., P. Kyröläinen, M. Kaakinen, M.-R. Järvelin, J. Perttunen, and R. Svento (2015). Personality traits and stock market participation. *Journal of Empirical Finance 33*, 34–50. 2

Costa, P. T. and R. R. McCrae (1989). NEO five-factor inventory (NEO-FFI). *Odessa, FL: Psychological Assessment Resources*. 3

Crossley, T. F. and J. K. Winter (2014). Asking households about expenditures: what have we learned? In *Improving the Measurement of Consumer Expenditures*, pp. 23–50. University of Chicago Press. 8

Cubel, M., A. Nuevo-Chiquero, S. Sanchez-Pages, and M. Vidal-Fernandez (2016). Do personality traits affect productivity? Evidence from the laboratory. *The Economic Journal 126*(592), 654–681. 4

Duckworth, A. L., C. Peterson, M. D. Matthews, and D. R. Kelly (2007). Grit: perseverance and passion for long-term goals. *Journal of Personality and Social Psychology 92*(6), 1087. 5

Dupuy, A. and A. Galichon (2014). Personality traits and the marriage market. *Journal of Political Economy 122*(6), 1271–1319. 2, 6

Engel, E. (1857). Die Productions-und Consumptions-Verhaltnisse des Konigreichs Sachsen', reprinted in. *Bulletin de I'Institut International de Statistique 9*. 16

Fletcher, J. M. (2013). The effects of personality traits on adult labor market outcomes: Evidence from siblings. *Journal of Economic Behavior & Organization 89*, 122–135. 4

Flinn, C. J., P. E. Todd, and W. Zhang (2018). Personality traits, intra-household allocation and the gender wage gap. *European Economic Review Forthcoming*. 2, 6, 14, 28

Fraley, R. C. and B. W. Roberts (2005). Patterns of continuity: a dynamic model for conceptualizing the stability of individual differences in psychological constructs across the life course. *Psychological Review 112*(1), 60. 12

Gaunt, R. (2006). Couple similarity and marital satisfaction: are similar spouses happier? *Journal of Personality 74*(5), 1401–1420. 2

Gorman, W. (1976). Tricks with utility functions, in Essays in Economics Analysis (M. Artis and R. Nobay, Eds.). 17

Haisken-DeNew, J. P. and M. H. Hahn (2010). PanelWhiz: efficient data extraction of complex panel data sets–an example using the German SOEP. *Schmollers Jahrbuch (Journal of Applied Social Science Studies) 130*(4), 643–654. 7

Hanes, N. and E. Norlin (2011). Psychological Traits and Earnings Differentials among Men: A Study of Second-generation Immigrants in Sweden. *The Scandinavian Journal of Economics 113*(2), 318–341. 4

Heckman, J., R. Pinto, and P. Savelyev (2013). Understanding the mechanisms through which an influential early childhood program boosted adult outcomes. *The American Economic Review 103*(6), 2052–2086. 2, 5

Jackson, J. E. (2005). *A user's guide to principal components.*, Volume 587. John Wiley & Sons. 9

Lam, D. (1988). Marriage markets and assortative mating with household public goods: Theoretical results and empirical implications. *Journal of Human Resources 23*(4), 462–487. 6

Lewbel, A. (1985). A Unified Approach to Incorporating Demographic or Other Effects into Demand Systems. *The Review of Economic Studies 52*(1), 1–18. 17, 18

Lucas, R. E. and M. B. Donnellan (2011). Personality development across the life span: Longitudinal analyses with a national sample from Germany. *Journal of Personality and Social Psychology 101*(4), 847. 11, 12

Lundberg, S. (2012). Personality and marital surplus. *IZA Journal of Labor Economics 1*(1), 3. 2, 3, 5, 6, 7, 14

Lundberg, S. and R. A. Pollak (2007). The american family and family economics. *Journal of Economic Perspectives 21*(2), 3–26. 2

Mangiavacchi, L., F. Perali, and L. Piccoli (2018). Intrahousehold distribution in migrant-sending families. *Journal of Demographic Economics 84*(1), 107–148. 28

Marcus, J., R. Siegers, and M. M. Grabka (2013). Preparation of data from the new soep consumption module: Editing, imputation, and smoothing. Technical report, Data Documentation, DIW. 8

Menon, M., F. Perali, and L. Piccoli (2018). Collective consumption: an application to the passive drinking effect. *Review of Economics of the Household 16*(1), 143–169. 28

Mueller, G. and E. Plug (2006). Estimating the effect of personality on male and female earnings. *ILR Review 60*(1), 3–22. 4

Nyhus, E. K. and E. Pons (2005). The effects of personality on earnings. *Journal of Economic Psychology 26*(3), 363–384. 4

Pestel, N. (2017). Marital Sorting, Inequality and the Role of Female Labour Supply: Evidence from East and West Germany. *Economica 84*(333), 104–127. 7

Pollak, R. A. and T. J. Wales (1981). Demographic variables in demand analysis. *Econometrica 6*, 1533–1551. 8, 17

Poropat, A. E. (2009). A meta-analysis of the five-factor model of personality and academic performance. *Psychological Bulletin 135*(2), 322. 5

Proto, E. and A. Rustichini (2015). Life satisfaction, income and personality. *Journal of Economic Psychology 48*, 17–32. 2

Rapallini, C. and A. Rustichini (2016). Elective affinities matter as much as ethnicity in multi-ethnic schools. *Journal of Economic Behavior & Organization 131*, 243–262. 2

Roberts, B. W. (1997). Plaster or plasticity: Are adult work experiences associated with personality change in women? *Journal of Personality 65*(2), 205–232. 11

Roberts, B. W. and W. F. DelVecchio (2000). The rank-order consistency of personality traits from childhood to old age: a quantitative review of longitudinal studies. *Psychological Bulletin 126*(1), 3. 11, 12

Roberts, B. W., N. R. Kuncel, R. Shiner, A. Caspi, and L. R. Goldberg (2007). The power of personality: The comparative validity of personality traits, socioeconomic status, and cognitive ability for predicting important life outcomes. *Perspectives on Psychological Science 2*(4), 313–345. 4

Rustichini, A., C. G. DeYoung, J. C. Anderson, and S. V. Burks (2016). Toward the integration of personality theory and decision theory in explaining economic behavior: An experimental investigation. *Journal of Behavioral and Experimental Economics 64*, 122–137. 2, 5

Specht, J., W. Bleidorn, J. J. A. Denissen, M. Hennecke, R. Hutteman, C. Kandler, M. Luhmann, U. Orth, A. K. Reitz, and J. Zimmermann (2014). What drives adult personality development? A comparison of theoretical perspectives and empirical evidence. *European Journal of Personality 28*(3), 216–230. 11

Specht, J., B. Egloff, and S. C. Schmukle (2011). Stability and change of personality across the life course: The impact of age and major life events on mean-level and rank-order stability of the Big Five. *Journal of Personality and Social Psychology 101*(4), 862. 11, 12

Specht, J., B. Egloff, and S. C. Schmukle (2013). Examining mechanisms of personality maturation: The impact of life satisfaction on the development of the Big Five personality traits. *Social Psychological and Personality Science 4*(2), 181–189. 11, 12

Stevenson, B. and J. Wolfers (2007). Marriage and divorce: Changes and their driving forces. *Journal of Economic Perspectives 21*(2), 27–52. 2

Terza, J. V., A. Basu, and P. J. Rathouz (2008). Two-stage residual inclusion estimation: Addressing endogeneity in health econometric modeling. *Journal of Health Economics 27*, 531–543. 17

Wagner, G. G., J. R. Frick, and J. Schupp (2007). The German Socio-Economic Panel study (SOEP)-evolution, scope and enhancements. *Schmollers Jahrbuch (Journal of Applied Social Science Studies) 127*(1). 7

Supplementary material

A Questions about household consumption in the SOEP 2010 household questionnaire

Question 72 of the household 2010 questionnaire reads as follows:

In the following, you see a list of possible expenditures that we have not asked about so far in this survey. Did you or another household member make any of the following expenditures? If yes: how much in total did these expenditures cost your household in 2009?

You can state the expenditures for 2009 either as monthly averages or as total yearly expenditures!

1. *Food, groceries at home*
2. *Food / drinks outside the home*
3. *Clothing / shoes*
4. *Body care / cosmetics / hairdresser*
5. *Health (e.g., medicines, courses, consultation fees)*
6. *Telecommunications (landline, cellular phone, Internet)*
7. *Education / further training*
8. *Culture (theater, cinema, concerts, museums, exhibitions)*
9. *Leisure activities, hobbies, sports, yard and garden, animals*
10. *Vacation trips, including short vacations*
11. *Life insurance, private pension insurance*
12. *Other insurance policies (e.g., car, legal, household goods)*
13. *Motor vehicle repairs (including motorcycle)*
14. *Transport (car, train, bus, etc.)*
15. *Furniture, household appliances not mentioned previously*
16. *Other expenditures*

As stated in Section 3, to avoid an excessive number of missing values, we aggregate items (11) and (12) into a unique "insurance" category and items (13) and (14) into a unique "Transportation" category.

B Questions about personality traits in the SOEP 2009 individual questionnaire

Question 120 of the individual 2009 questionnaire reads as follows:

Below are different qualities that a person can have.

You will probably find that some apply to you perfectly and that some do not apply to you at all. With others, you may be somewhere in between.

Please answer according to the following scale: 1 means "does not apply to me at all", 7 means "applies to me perfectly".

With values between 1 and 7, you can express where you lie between these two extremes..

I see myself 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, aesthetic 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*
16. *is eager for knowledge*

Of these, the last one is not used, and each triplet defines one personality trait as the average score of the three questions (thus, the scores of 3, 7, 12 and 15 have to be reverted):

Openness: 4, 9, 14
Conscientiousness: 1, 7, 11
Extraversion: 2, 8, 12
Agreeableness: 3, 6, 13
Neuroticism: 5, 10, 15

C Probability of nonzero consumption: coefficients and marginal effects

Tables C.1 to C.12 show the coefficients of the probability of consuming and the relative marginal effect of each of the twelve categories of consumption estimated, according to equation 3 for the four samples of our analysis. All the Big Five personality traits predict the probability of consuming a few specific categories of commodities. In some cases the effect is independent of the individual's gender, while in other cases, it is gender specific. Generally, personality has greater predictive power for singles, but certain effects may still be present for childless couples and for couples with children. Two examples of effects that are persistent across typologies of households are the positive effect of the Mental Openness trait on the probability of spending on culture, as already discussed, and the positive effect of the Neuroticism trait on the expenditure on health. An example of a less clear effect is that of the Neuroticism trait on the probability of spending on insurance: the coefficient for single women is statistically significant and negative, and that for single men is not statistically significant, while among couples, we find a positive and statistically significant coefficient for husbands in childless couples and wives in couples with children. The expected result, i.e., that people who are inclined to worry are more prone to buy insurance, is not always verified.

Table C.1: Estimation results of the probability of consumption: Education

Consumption category	Singles		Childless couples		Couples w/ch.	
	Men	Women	Men	Women	Men	Women
Food at home	-0.169	-0.329**	10.367**	5.056**		
Food out of the home	-0.001	-0.013	0.068	0.008	0.224	0.188
Clothing/shoes	-0.055	-0.069	0.027	0.032		
Personal hygiene	-0.086	-0.126	-0.159	0.241	-0.210	0.039
Health	-0.005	-0.135*	-0.247***	-0.176***	-0.087	-0.094
Telecomunications	-0.344***	0.050	-0.214*	-0.116	-0.929***	0.268
Education	0.235***	0.347***	0.243***	0.179***	0.070	0.130
Culture	0.179**	0.249***	0.127**	0.119***	0.306*	0.184
Leisure time	-0.076	-0.107*	-0.028	-0.055	-0.010	-0.031
Vacations	0.041	0.138**	0.064	0.046	0.279	0.253**
Insurance	-0.065	0.055	0.004	0.067	0.186	0.110
Transportation	-0.215**	-0.210***	-0.107	-0.034		

Note: estimation also include the following control variables, not reported in the table: age, age-squared, being immigrant, working part-time, working full-time, being retired, years of education, being owner of the dwelling, living in an urban settlement and living in East-Germany. For couples with children, number of children is also included. Full estimation tables are available upon request.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table C.2: Marginal effects: Education

Consumption category	Singles		Childless couples		Couples w/ch.	
	Men	Women	Men	Women	Men	Women
Food at home	-0.000	-0.000	0.000	0.000		
Food out of the home	-0.000	-0.002	0.005	0.001	-0.044	-0.036
Clothing/shoes	-0.003	-0.007	0.000	0.000		
Personal hygiene	-0.001	-0.002	-0.000	0.001	-0.002	0.000
Health	-0.000	-0.006	-0.012	-0.008	-0.004	-0.004
Telecomunications	-0.010	0.002	-0.001	-0.001	-0.000	0.000
Education	0.015	0.021	0.005	0.003	0.003	0.006
Culture	0.029	0.042	0.022	0.021	-0.035	-0.021
Leisure time	-0.009	-0.024	-0.003	-0.005	-0.001	-0.002
Vacations	0.005	0.023	0.006	0.005	0.003	0.003
Insurance	-0.008	0.035	0.000	0.007	-0.001	-0.000
Transportation	0.241	-0.062	0.001	0.000		

Table C.3: Estimation results of the probability of consumption: Mental Openness

Consumption category	Singles		Childless couples		Couples w/ch.	
	Men	Women	Men	Women	Men	Women
Food at home	-0.070	-0.001	3.380**	0.926**		
Food out of the home	0.081	0.098**	0.017	0.059	0.094	-0.004
Clothing/shoes	0.051	-0.051	-0.031	0.032		
Personal hygiene	0.126*	0.077	0.064	0.124	-0.040	0.032
Health	0.100*	0.063	0.036	-0.094**	0.010	0.022
Telecomunications	-0.143*	0.085	-0.200**	0.024	0.070	0.137
Education	0.282***	0.231***	0.146***	0.042	0.101**	0.107**
Culture	0.254***	0.190***	0.117***	0.095***	0.090*	0.132***
Leisure time	0.060	0.073*	0.082**	-0.004	0.101	0.050
Vacations	0.096*	-0.014	-0.033	0.006	0.082	-0.044
Insurance	0.021	0.038	0.041	0.016	-0.085	0.035
Transportation	-0.124**	0.039	-0.102	0.075	-0.406*	0.217

Note: estimation also include the following control variables, not reported in the table: age, age-squared, being immigrant, working part-time, working full-time, being retired, years of education, being owner of the dwelling, living in an urban settlement and living in East-Germany. For couples with children, number of children is also included. Full estimation tables are available upon request.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table C.4: Marginal effects: Mental Openness

Consumption category	Singles		Childless couples		Couples w/ch.	
	Men	Women	Men	Women	Men	Women
Food at home	-0.000	-0.000	0.000	0.000		
Food out of the home	0.014	0.011	0.001	0.005	-0.018	0.001
Clothing/shoes	0.003	-0.005	-0.000	0.000		
Personal hygiene	0.002	0.001	0.000	0.000	-0.000	0.000
Health	0.001	0.003	0.002	-0.004	0.000	0.001
Telecomunications	-0.004	0.003	-0.001	0.000	0.000	0.000
Education	0.018	0.014	0.003	0.001	0.005	0.005
Culture	0.041	0.032	0.020	0.017	-0.010	-0.015
Leisure time	0.007	0.016	0.008	-0.000	0.007	0.003
Vacations	0.012	-0.002	-0.003	0.001	0.001	-0.001
Insurance	0.002	0.024	0.004	0.002	0.000	-0.000
Transportation	0.139	0.011	0.001	-0.000	0.000	0.000

Table C.5: Estimation results of the probability of consumption: Conscientiousness

Consumption category	Singles		Childless couples		Couples w/ch.	
	Men	Women	Men	Women	Men	Women
Food at home	-0.233*	0.120	2.853***	0.436		
Food out of the home	-0.028	-0.113***	0.017	-0.045	-0.021	-0.108*
Clothing/shoes	-0.162***	-0.017	0.012	-0.025		
Personal hygiene	-0.013	0.023	0.152*	-0.040	0.054	-0.005
Health	-0.032	-0.024	-0.046	0.034	-0.148*	-0.091
Telecomunications	-0.017	-0.007	0.340***	-0.202***	-0.538***	-0.150
Education	-0.079	-0.078	-0.044	-0.032	0.053	-0.058
Culture	-0.162***	-0.150***	0.019	-0.051*	-0.081	-0.064
Leisure time	-0.113**	-0.053	0.061	-0.023	-0.161**	0.015
Vacations	-0.211***	-0.099**	-0.020	0.017	0.006	-0.060
Insurance	-0.055	0.021	0.050	-0.050	-0.158***	0.040
Transportation	0.066	0.034	0.135*	0.145*	0.089	0.328**

Note: estimation also include the following control variables, not reported in the table: age, age-squared, being immigrant, working part-time, working full-time, being retired, years of education, being owner of the dwelling, living in an urban settlement and living in East-Germany. For couples with children, number of children is also included. Full estimation tables are available upon request.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table C.6: Marginal effects: Conscientiousness

Consumption category	Singles		Childless couples		Couples w/ch.	
	Men	Women	Men	Women	Men	Women
Food at home	-0.000	0.000	0.000	0.000		
Food out of the home	-0.005	-0.013	0.001	-0.004	0.004	0.021
Clothing/shoes	-0.009	-0.002	0.000	-0.000		
Personal hygiene	-0.000	0.000	0.000	-0.000	0.000	-0.000
Health	-0.000	-0.001	-0.002	0.002	-0.007	-0.004
Telecomunications	-0.001	-0.000	0.002	-0.001	-0.000	-0.000
Education	-0.005	-0.005	-0.001	-0.001	0.003	-0.003
Culture	-0.026	-0.026	0.003	-0.009	0.009	0.007
Leisure time	-0.014	-0.012	0.006	-0.002	-0.011	0.001
Vacations	-0.026	-0.016	-0.002	0.002	0.000	-0.001
Insurance	-0.007	0.013	0.005	-0.005	0.001	-0.000
Transportation	-0.074	0.010	-0.001	-0.001	0.000	0.000

Table C.7: Estimation results of the probability of consumption: Extraversion

Consumption category	Singles		Childless couples		Couples w/ch.	
	Men	Women	Men	Women	Men	Women
Food at home	0.085	-0.203**	0.991**	2.250***		
Food out of the home	-0.046	0.065	0.013	-0.052	0.046	0.094
Clothing/shoes	0.128**	-0.019	-0.019	0.036		
Personal hygiene	-0.055	-0.060	-0.088	-0.099	-0.024	-0.057
Health	-0.141***	0.008	-0.080	-0.037	-0.026	0.018
Telecomunications	0.016	0.010	-0.051	-0.029	0.094	-0.090
Education	-0.093*	-0.112**	-0.020	-0.017	0.070	-0.053
Culture	-0.026	-0.064	-0.033	-0.056*	-0.017	0.035
Leisure time	-0.034	-0.076*	0.006	-0.023	-0.042	-0.089
Vacations	0.033	0.064	0.020	0.044	0.040	0.095
Insurance	-0.071	-0.117**	-0.035	-0.031	-0.014	-0.017
Transportation	-0.122**	-0.157***	-0.044	-0.009	-0.564***	-0.365*

Note: estimation also include the following control variables, not reported in the table: age, age-squared, being immigrant, working part-time, working full-time, being retired, years of education, being owner of the dwelling, living in an urban settlement and living in East-Germany. For couples with children, number of children is also included. Full estimation tables are available upon request.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table C.8: Marginal effects: Extraversion

Consumption category	Singles		Childless couples		Couples w/ch.	
	Men	Women	Men	Women	Men	Women
Food at home	0.000	-0.000	0.000	0.000		
Food out of the home	-0.008	0.008	0.001	-0.004	-0.009	-0.018
Clothing/shoes	0.007	-0.002	-0.000	0.000		
Personal hygiene	-0.001	-0.001	-0.000	-0.000	-0.000	-0.000
Health	-0.001	0.000	-0.004	-0.002	-0.001	0.001
Telecomunications	0.000	0.000	-0.000	-0.000	0.000	-0.000
Education	-0.006	-0.007	-0.000	-0.000	0.003	-0.003
Culture	-0.004	-0.011	-0.006	-0.010	0.002	-0.004
Leisure time	-0.004	-0.017	0.001	-0.002	-0.003	-0.006
Vacations	0.004	0.010	0.002	0.004	0.000	0.001
Insurance	-0.008	-0.074	-0.004	-0.003	0.000	0.000
Transportation	0.137	-0.046	0.000	0.000	0.000	0.000

Table C.9: Estimation results of the probability of consumption: Agreeableness

Consumption category	Singles		Childless couples		Couples w/ch.	
	Men	Women	Men	Women	Men	Women
Food at home	-0.011	0.083	-2.721***	0.717**		
Food out of the home	-0.062	0.033	-0.007	-0.080**	-0.006	0.051
Clothing/shoes	0.136**	0.065	0.018	-0.058		
Personal hygiene	0.011	-0.042	-0.181**	0.107	-0.079	0.101
Health	-0.014	0.143***	-0.033	0.007	-0.018	0.107
Telecomunications	0.105	0.033	0.223***	0.080	0.083	0.077
Education	0.014	0.019	0.020	0.006	-0.010	0.086*
Culture	0.091*	0.050	0.008	0.040	0.012	0.004
Leisure time	0.140***	-0.018	-0.048	0.021	0.038	-0.012
Vacations	0.095**	0.048	0.005	0.024	0.073	0.066
Insurance	0.052	0.005	0.040	-0.010	-0.030	0.017
Transportation	0.043	-0.080	0.023	-0.007	0.708***	-0.582***

Note: estimation also include the following control variables, not reported in the table: age, age-squared, being immigrant, working part-time, working full-time, being retired, years of education, being owner of the dwelling, living in an urban settlement and living in East-Germany. For couples with children, number of children is also included. Full estimation tables are available upon request.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table C.10: Marginal effects: Agreeableness

Consumption category	Singles		Childless couples		Couples w/ch.	
	Men	Women	Men	Women	Men	Women
Food at home	-0.000	0.000	0.000	0.000		
Food out of the home	-0.011	0.004	-0.001	-0.006	0.001	-0.010
Clothing/shoes	0.008	0.007	0.000	-0.001		
Personal hygiene	0.000	-0.001	-0.001	0.000	-0.001	0.001
Health	-0.000	0.006	-0.002	0.000	-0.001	0.005
Telecomunications	0.003	0.001	0.001	0.000	0.000	0.000
Education	0.001	0.001	0.000	0.000	-0.000	0.004
Culture	0.015	0.009	0.001	0.007	-0.001	-0.001
Leisure time	0.017	-0.004	-0.004	0.002	0.003	-0.001
Vacations	0.012	0.008	0.001	0.002	0.001	0.001
Insurance	0.006	0.003	0.004	-0.001	0.000	-0.000
Transportation	-0.048	-0.024	-0.000	0.000	0.000	0.000

Table C.11: Estimation results of the probability of consumption: Neuroticism

Consumption category	Singles		Childless couples		Couples w/ch.	
	Men	Women	Men	Women	Men	Women
Food at home	0.068	-0.060	4.604***	0.626*		
Food out of the home	-0.041	-0.035	-0.053	-0.006	-0.100*	0.175***
Clothing/shoes	0.054	0.022	0.008	-0.024		
Personal hygiene	0.063	-0.051	0.025	-0.011	0.176	0.030
Health	0.101*	0.095**	-0.027	0.029	0.145**	0.177***
Telecomunications	0.131*	0.093	0.048	0.061	-0.127	0.113
Education	0.013	-0.038	-0.014	-0.075**	-0.034	-0.004
Culture	-0.017	-0.077*	-0.066**	-0.011	-0.046	0.074
Leisure time	-0.053	-0.024	-0.046	-0.033	-0.050	0.022
Vacations	-0.067	-0.092**	-0.037	-0.025	0.009	0.022
Insurance	0.071	-0.063*	0.058**	0.049	0.061	0.095*
Transportation	0.144**	0.025	-0.130	-0.058	0.296	0.022

Note: estimation also include the following control variables, not reported in the table: age, age-squared, being immigrant, working part-time, working full-time, being retired, years of education, being owner of the dwelling, living in an urban settlement and living in East-Germany. For couples with children, number of children is also included. Full estimation tables are available upon request.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table C.12: Marginal effects: Neuroticism

Consumption category	Singles		Childless couples		Couples w/ch.	
	Men	Women	Men	Women	Men	Women
Food at home	0.000	-0.000	0.000	0.000		
Food out of the home	-0.007	-0.004	-0.004	-0.000	0.019	-0.034
Clothing/shoes	0.003	0.002	0.000	-0.000		
Personal hygiene	0.001	-0.001	0.000	-0.000	0.001	0.000
Health	0.001	0.004	-0.001	0.001	0.007	0.008
Telecomunications	0.004	0.003	0.000	0.000	-0.000	0.000
Education	0.001	-0.002	-0.000	-0.001	-0.002	-0.000
Culture	-0.003	-0.013	-0.011	-0.002	0.005	-0.009
Leisure time	-0.007	-0.005	-0.004	-0.003	-0.004	0.002
Vacations	-0.008	-0.015	-0.004	-0.002	0.000	0.000
Insurance	0.008	-0.040	0.006	0.005	-0.000	-0.000
Transportation	-0.161	0.007	0.001	0.000	0.000	0.000

D   Robustness analysis: Alternative definition of PTs

Table D.1: System of Engel curves: Education

Consumption category	Childless couples		Couples w/ch.	
	Average	Association	Average	Association
Food at home	0.001	0.002	0.006	0.002
Food out of the home	0.005	-0.002	-0.004	0.000
Clothing/shoes	0.003	0.000	0.001	-0.001
Personal hygiene	-0.002	0.001	0.000	0.001
Health	0.001	-0.001	-0.002	0.000
Telecomunications	-0.001	0.000	-0.008***	0.000
Education	0.005***	0.000	0.005	0.001
Culture	0.004***	0.000	-0.001	0.000
Leisure time	-0.002	0.001	-0.008	0.001
Vacations	0.002	-0.001	0.021*	-0.001
Insurance	-0.004	0.000	-0.024**	-0.005
Transportation	-0.006	-0.001	0.004	0.002

Note: estimation also include the following control variables, not reported in the table: age, age-squared, being immigrant, working part-time, working full-time, being retired, years of education, being owner of the dwelling, living in an urban settlement and living in East-Germany. For couples with children, number of children is also included. Full estimation tables are available upon request.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table D.2: System of Engel curves: Mental Openness

Consumption category	Childless couples		Couples w/ch.	
	Average	Association	Average	Association
Food at home	-0.003	0.001	0.003	0.006
Food out of the home	0.003*	0.000	0.000	-0.002
Clothing/shoes	0.000	0.001	0.000	0.000
Personal hygiene	0.001	0.000	0.000	0.001
Health	-0.001	0.000	0.000	-0.001
Telecomunications	0.002**	0.000	0.001	-0.002
Education	0.002***	0.000	0.005*	0.001
Culture	0.003***	0.000	0.002*	-0.001
Leisure time	0.002	0.000	0.004**	-0.002
Vacations	-0.005*	0.003	-0.002	0.004
Insurance	-0.002	-0.004**	-0.006	0.000
Transportation	0.001	-0.002	-0.007**	-0.008***

Note: estimation also include the following control variables, not reported in the table: age, age-squared, being immigrant, working part-time, working full-time, being retired, years of education, being owner of the dwelling, living in an urban settlement and living in East-Germany. For couples with children, number of children is also included. Full estimation tables are available upon request.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table D.3: System of Engel curves: Conscientiousness

| | Childless couples | | Couples w/ch. | |
Consumption category	Average	Association	Average	Association
Food at home	0.002	0.004	0.015***	-0.002
Food out of the home	-0.002	0.000	-0.003	0.001
Clothing/shoes	-0.001	0.000	0.002	-0.002
Personal hygiene	0.001	-0.001	0.002*	-0.001
Health	0.000	0.000	0.000	0.000
Telecomunications	0.000	-0.001*	-0.001	0.001
Education	0.000	0.000	0.002	-0.001
Culture	0.001	-0.001***	-0.001	0.000
Leisure time	-0.001	-0.001	-0.001	0.000
Vacations	0.002	-0.001	-0.004	0.001
Insurance	0.000	0.000	-0.010*	0.003
Transportation	-0.002	0.003	-0.003	0.004

Note: estimation also include the following control variables, not reported in the table: age, age-squared, being immigrant, working part-time, working full-time, being retired, years of education, being owner of the dwelling, living in an urban settlement and living in East-Germany. For couples with children, number of children is also included. Full estimation tables are available upon request.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table D.4: System of Engel curves: Extraversion

| | Childless couples | | Couples w/ch. | |
Consumption category	Average	Association	Average	Association
Food at home	-0.002	-0.004	0.004	0.005
Food out of the home	0.003**	0.001	0.002	0.001
Clothing/shoes	0.000	0.001	0.003	0.000
Personal hygiene	0.000	0.000	0.002*	0.000
Health	0.000	0.000	0.000	0.000
Telecomunications	0.001*	0.000	0.001	-0.003**
Education	0.000	0.000	-0.001	0.001
Culture	0.000	0.000	0.000	0.000
Leisure time	-0.001	0.000	-0.002	-0.002
Vacations	0.004	0.000	0.008*	-0.007*
Insurance	0.001	-0.003	-0.013***	0.003
Transportation	-0.002	0.002	-0.001	-0.002

Note: estimation also include the following control variables, not reported in the table: age, age-squared, being immigrant, working part-time, working full-time, being retired, years of education, being owner of the dwelling, living in an urban settlement and living in East-Germany. For couples with children, number of children is also included. Full estimation tables are available upon request.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table D.5: System of Engel curves: Agreeableness

| | Childless couples | | Couples w/ch. | |
Consumption category	Average	Association	Average	Association
Food at home	0.005	-0.003	-0.003	0.006
Food out of the home	-0.002*	-0.001	0.003*	-0.002
Clothing/shoes	0.000	-0.001	-0.002	0.000
Personal hygiene	0.000	0.000	0.000	-0.001
Health	0.000	0.001	0.001	0.000
Telecomunications	-0.001	0.001	0.000	0.000
Education	0.000	0.000	0.003	0.000
Culture	-0.001*	0.000	0.000	0.000
Leisure time	-0.001	-0.003**	0.000	0.000
Vacations	-0.001	0.001	0.002	0.000
Insurance	-0.001	0.003	0.003	-0.002
Transportation	0.002	0.002	-0.004	0.002

Note: estimation also include the following control variables, not reported in the table: age, age-squared, being immigrant, working part-time, working full-time, being retired, years of education, being owner of the dwelling, living in an urban settlement and living in East-Germany. For couples with children, number of children is also included. Full estimation tables are available upon request.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table D.6: System of Engel curves: Neuroticism

| | Childless couples | | Couples w/ch. | |
Consumption category	Average	Association	Average	Association
Food at home	0.003	0.001	0.005	0.006
Food out of the home	-0.002*	0.001	0.000	0.000
Clothing/shoes	-0.003**	-0.001	-0.004	0.001
Personal hygiene	-0.001	-0.001	0.001	0.000
Health	0.004***	0.000	0.001	0.001
Telecomunications	0.000	0.000	0.001	0.000
Education	-0.001	0.000	0.000	-0.002
Culture	-0.001*	0.000	0.000	0.000
Leisure time	-0.004***	-0.001	-0.001	-0.001
Vacations	-0.005*	0.004*	-0.002	0.000
Insurance	0.000	-0.001	-0.009**	-0.002
Transportation	0.006***	0.001	0.003	-0.002

Note: estimation also include the following control variables, not reported in the table: age, age-squared, being immigrant, working part-time, working full-time, being retired, years of education, being owner of the dwelling, living in an urban settlement and living in East-Germany. For couples with children, number of children is also included. Full estimation tables are available upon request.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

E Robustness analysis: age groups

Table E.1: System of Engel curves: Mental Openness. Sample of individuals less than 60 years old

	Singles		Childless couples	
Consumption category	Men	Women	Men	Women
Food at home	-0.009	-0.004	-0.003	-0.003
Food out of the home	0.003	0.002	0.007***	0.003
Clothing/shoes	-0.002	-0.003	0.001	0.002
Personal hygiene	0.001	0.001	-0.001	-0.001
Health	0.000	0.005	-0.001	-0.001
Telecomunications	0.006**	0.000	0.001	0.002
Education	0.002	0.000	0.003*	0.002
Culture	0.004***	0.003***	0.003***	0.000
Leisure time	0.001	0.001	0.001	0.001
Vacations	-0.009*	-0.009*	-0.003	-0.001
Insurance	0.000	0.004	-0.011**	-0.003
Transportation	0.000	0.003	-0.002	0.000

Note: estimation also include the following control variables, not reported in the table: being immigrant, years of education, being owner of the dwelling, living in an urban settlement and living in East-Germany. Full estimation tables are available upon request.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table E.2: System of Engel curves: Conscientiousness. Sample of individuals less than 60 years old

	Singles		Childless couples	
Consumption category	Men	Women	Men	Women
Food at home	0.012*	0.012	0.011**	0.004
Food out of the home	-0.006	-0.007*	-0.001	0.000
Clothing/shoes	-0.005	0.000	-0.001	0.000
Personal hygiene	0.002	-0.001	0.002	0.001
Health	0.002	0.001	0.000	0.001
Telecomunications	-0.004	0.000	0.000	-0.002
Education	-0.002	-0.001	-0.002	0.000
Culture	-0.003*	-0.001	-0.001	0.000
Leisure time	-0.005*	-0.003	-0.003	-0.003
Vacations	0.000	-0.005	-0.002	-0.005
Insurance	0.007	0.013**	-0.002	0.008
Transportation	0.001	-0.007	-0.002	-0.001

Note: estimation also include the following control variables, not reported in the table: being immigrant, years of education, being owner of the dwelling, living in an urban settlement and living in East-Germany. Full estimation tables are available upon request.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table E.3: System of Engel curves: Neuroticism. Sample of individuals less than 60 years old

| | Singles | | Childless couples | |
Consumption category	Men	Women	Men	Women
Food at home	0.000	-0.002	0.001	-0.004
Food out of the home	-0.005	0.000	0.001	-0.004*
Clothing/shoes	0.001	0.000	-0.005**	0.000
Personal hygiene	0.002	0.003	-0.002	0.002
Health	0.005**	0.004	0.001	0.002*
Telecomunications	0.003	0.000	-0.001	0.002
Education	0.001	0.004	-0.001	-0.001
Culture	0.000	0.000	-0.001**	-0.001
Leisure time	-0.001	-0.001	0.000	-0.005*
Vacations	-0.005	-0.005	-0.002	0.000
Insurance	-0.004	-0.002	0.001	-0.004
Transportation	0.000	-0.002	0.008**	0.008**

Note: estimation also include the following control variables, not reported in the table: being immigrant, years of education, being owner of the dwelling, living in an urban settlement and living in East-Germany. Full estimation tables are available upon request.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table E.4: System of Engel curves: Mental Openness. Sample of individuals more than 60 years old

| | Singles | | Childless couples | |
Consumption category	Men	Women	Men	Women
Food at home	-0.008	-0.013*	0.000	0.000
Food out of the home	-0.004	0.004	0.000	0.000
Clothing/shoes	0.002	0.003	0.001	-0.001
Personal hygiene	0.003	0.000	0.000	0.002**
Health	-0.004	-0.004	-0.002	0.001
Telecomunications	0.000	0.001	0.001	0.000
Education	0.001	0.001*	0.001***	0.000
Culture	0.004**	0.003***	0.001*	0.001**
Leisure time	0.003	0.004*	0.003*	0.000
Vacations	0.009	-0.001	-0.005	-0.004
Insurance	-0.003	0.000	0.003	0.000
Transportation	0.006	-0.001	0.001	0.000

Note: estimation also include the following control variables, not reported in the table: being immigrant, years of education, being owner of the dwelling, living in an urban settlement and living in East-Germany. Full estimation tables are available upon request.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table E.5: System of Engel curves: Conscientiousness. Sample of individuals more than 60 years old

	Singles		Childless couples	
Consumption category	Men	Women	Men	Women
Food at home	0.017	0.005	0.000	0.002
Food out of the home	0.002	-0.004*	-0.001	-0.002
Clothing/shoes	-0.001	-0.001	0.000	-0.001
Personal hygiene	0.001	0.000	-0.001	0.001
Health	0.001	-0.001	-0.001	0.000
Telecomunications	-0.004	0.001	0.001	-0.001
Education	-0.001	-0.001	0.000	-0.001**
Culture	-0.002	0.000	0.000	0.000
Leisure time	0.001	0.001	0.000	0.000
Vacations	-0.008	-0.002	-0.003	0.007*
Insurance	0.000	0.000	0.001	0.000
Transportation	0.002	0.001	0.001	-0.002

Note: estimation also include the following control variables, not reported in the table: being immigrant, years of education, being owner of the dwelling, living in an urban settlement and living in East-Germany. Full estimation tables are available upon request.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table E.6: System of Engel curves: Neuroticism. Sample of individuals more than 60 years old

	Singles		Childless couples	
Consumption category	Men	Women	Men	Women
Food at home	-0.007	0.009	0.002	0.004
Food out of the home	-0.004	-0.005**	0.000	-0.002
Clothing/shoes	-0.002	-0.004*	-0.001	-0.001
Personal hygiene	0.006*	-0.002	-0.002**	0.001
Health	0.009**	0.006**	0.001	0.004***
Telecomunications	0.004	0.004***	0.000	0.000
Education	-0.001	0.000	0.000	-0.001**
Culture	-0.002	-0.001	0.000	0.000
Leisure time	-0.009	-0.002	-0.002*	-0.002
Vacations	-0.001	-0.005	-0.002	-0.009***
Insurance	0.007	0.000	0.002	0.001
Transportation	0.004	-0.006**	0.000	0.003*

Note: estimation also include the following control variables, not reported in the table: being immigrant, years of education, being owner of the dwelling, living in an urban settlement and living in East-Germany. Full estimation tables are available upon request.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

F Robustness analysis: education level

Table F.1: System of Engel curves: Mental Openness. Sample with at least one spouse with secondary education

	Singles		Childless couples		Couples w/ch.	
Consumption category	Men	Women	Men	Women	Men	Women
Food at home	-0.009	0.000	-0.006	0.001	-0.001	0.001
Food out of the home	0.005	0.004	0.003	0.001	0.005	-0.004
Clothing/shoes	-0.004	-0.002	-0.001	0.001	-0.003	0.000
Personal hygiene	0.000	0.000	-0.003***	0.002	0.001	0.000
Health	-0.004	0.006	0.000	-0.002	-0.001	0.000
Telecomunications	0.011**	-0.003	0.002	0.002	0.000	0.002
Education	0.000	-0.004	0.003**	0.002	0.005	0.006
Culture	0.005*	0.002	0.003***	0.001*	0.001	0.002**
Leisure time	0.002	0.003	0.001	0.000	0.004	0.001
Vacations	-0.008	-0.011	0.004	-0.005	0.005	-0.004
Insurance	-0.005	-0.001	-0.004	-0.005	-0.005	0.003
Transportation	0.009	-0.001	0.004	0.000	-0.005	-0.003

Note: estimation also include the following control variables, not reported in the table: age, age-squared, being immigrant, working part-time, working full-time, being retired, being owner of the dwelling, living in an urban settlement and living in East-Germany. Full estimation tables are available upon request.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table F.2: System of Engel curves: Mental Openness. Neither spouse has a secondary education

	Singles		Childless couples		Couples w/ch.	
Consumption category	Men	Women	Men	Women	Men	Women
Food at home	-0.001	-0.013*	0.005	-0.001	-0.001	0.001
Food out of the home	-0.003	0.003	0.001	0.001	0.005	-0.004
Clothing/shoes	0.002	0.000	0.002	-0.001	-0.003	0.000
Personal hygiene	0.003	0.000	0.002	0.000	0.001	0.000
Health	0.001	-0.002	-0.004**	0.002	-0.001	0.000
Telecomunications	-0.002	0.002	0.000	0.000	0.000	0.002
Education	0.001	0.001**	0.000	0.000	0.005	0.006
Culture	0.002**	0.004***	0.002***	0.001	0.001	0.002**
Leisure time	-0.002	0.003	0.002	0.001	0.004	0.001
Vacations	0.000	-0.002	-0.010**	-0.001	0.005	-0.004
Insurance	-0.003	0.002	-0.001	0.001	-0.005	0.003
Transportation	-0.002	0.002	-0.003	0.001	-0.005	-0.003

Note: estimation also include the following control variables, not reported in the table: age, age-squared, being immigrant, working part-time, working full-time, being retired, being owner of the dwelling, living in an urban settlement and living in East-Germany. Full estimation tables are available upon request.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

G First-stage estimations for total expenditure endogeneity

Table G.1: Estimation results of the first-stage regression for single men and single women

Variable	Men		Women	
	Coeff.	Std. Err.	Coeff.	Std. Err.
Income from pension or work	0.009	0.006	0.011*	0.006
Pricipal component n. 1 for wealth indicators	0.567***	0.158	0.469***	0.092
Pricipal component n. 2 for wealth indicators	-0.069	0.117	-0.192	0.171
Pricipal component n. 3 for wealth indicators	0.033	0.162	0.270**	0.118
Age	0.001	0.006	0.020***	0.005
Age square	0.000	0.000	0.000***	0.000
Works full-time	0.416***	0.065	0.293***	0.068
Works part-time	0.090	0.071	0.014	0.056
Perceives an onld-age or disability pension	0.298***	0.079	0.106	0.065
Immigrant to Germany since 1948	-0.101	0.076	-0.056	0.064
Own dwelling	0.184***	0.042	0.212***	0.032
Lives in an urban settlement	0.128***	0.039	0.088***	0.033
Lives in East Germany	-0.186***	0.042	-0.064*	0.035
Amount of education or training (in years)	0.167***	0.018	0.163***	0.016
Mental Openness	0.028	0.020	0.017	0.015
Conscientiousness	0.021	0.019	0.025	0.016
Extraversion	0.038**	0.019	0.046***	0.016
Agreeableness	-0.021	0.019	0.023	0.015
Neuroticism	-0.034*	0.019	0.002	0.014
Constant	5.531***	0.159	5.008***	0.132

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table G.2: Estimation results of the first-stage regression for couples with and without children

	Childless couples		Couples with children	
Variable	Coeff.	Std. Err.	Coeff.	Std. Err.
Husband income from pension or work	0.004	0.004	-0.008**	0.004
Wife income from pension or work	0.017***	0.004	0.001	0.005
Pricipal component n. 1 for wealth indicators	0.762***	0.114	0.734**	0.300
Pricipal component n. 2 for wealth indicators	0.142***	0.055	0.099	0.071
Pricipal component n. 3 for wealth indicators	-0.301***	0.111	-0.511*	0.294
Husband's age	0.013	0.011	0.003	0.021
Wife's age	0.013	0.010	-0.039	0.025
Husband's age squared	0.000	0.000	0.000	0.000
Wife's age squared	0.000	0.000	0.001**	0.000
Husband full-time worker	0.166***	0.043	0.369***	0.066
Wife full-time worker	-0.032	0.044	0.162***	0.062
Husband part-time worker	0.056	0.038	0.276***	0.072
wife part-time worker	-0.065*	0.038	0.114**	0.051
Husband perceives an onld-age or disability pension	0.026	0.045		
Wife perceives an onld-age or disability pension	-0.135***	0.042		
Husband is immigrant	-0.078*	0.047	0.084	0.054
Wife is immigrant	-0.072	0.045	0.007	0.050
Number of children			0.111***	0.020
Owner of dwelling	0.128***	0.022	0.123***	0.032
Live in a urban settlement	0.086***	0.023	0.024	0.032
Lives in East Germany	-0.208***	0.025	-0.097**	0.040
Husband's years of education	0.142***	0.012	0.132***	0.018
Wife's years of education	0.075***	0.013	0.071***	0.018
Husband's Openness	0.013	0.012	0.012	0.015
Wife's Openness	0.015	0.012	0.012	0.015
Husband's Conscientiousness	-0.012	0.011	0.014	0.015
Wife's Conscientiousness	0.009	0.011	-0.010	0.015
Husband's Extraversion	0.013	0.011	0.016	0.015
Wife's Extraversion	0.011	0.011	0.023	0.016
Husband's Agreeableness	-0.013	0.011	-0.025*	0.015
Wife's Agreeableness	-0.014	0.011	0.000	0.015
Husband's Neuroticism	-0.009	0.010	-0.005	0.014
Wife's Neuroticism	-0.020*	0.010	0.014	0.014
Constant	5.563***	0.145	6.551***	0.418

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$