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Shelly Lundberg

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Shelly Lundberg
University of Washington,
University of Bergen
and IZA

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IZA

P.O. Box 7240
53072 Bonn
Germany

Phone: +49-228-3894-0
Fax: +49-228-3894-180
E-mail: iza@iza.org

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ABSTRACT

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This paper uses data from the German Socio-economic Panel Study to examine the relationship between psychological traits, in particular personality, and the formation and dissolution of marital and cohabiting partnerships. Changing patterns of selection into and out of relationships indicate that the determinants of marital surplus have altered between older cohorts who were born in the years after World War II and younger cohorts born in the 1960s. For younger cohorts, relationships between personality traits and the probability of marriage are identical for men and women, which is consistent with returns to marriage that are based on joint consumption. Tastes for marital public goods are negatively related to openness to experience (a desire for change and variety) and positively related to conscientiousness for both men and women. Selection into marriage is associated with distinctly different personality profiles for older men and older women, suggesting that gender-specialized contributions to household public goods were an important source of marital surplus for these cohorts.

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Corresponding author:

Shelly Lundberg
Department of Economics
University of Washington
Box 353330
Seattle, WA 98195
USA
E-mail: lundberg@u.washington.edu

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Personality and Marital Surplus

1. Introduction

Economists are beginning to explore psychological dimensions of human capital, including personality, motivational factors, and preferences, as determinants of economic outcomes and individual success. A range of psychological traits including emotional stability, conscientiousness, and internal locus of control have been found to be strong predictors of educational and job performance, and have been labeled "non-cognitive skills" to acknowledge their labor market returns but to distinguish these characteristics from the cognitive skills measured in IQ and academic achievement tests. Bowles, Gintis and Osborne (2001) review the literature on the labor market returns to personality, and note that "incentive-enhancing preferences" are one of the advantages, along with quality schooling and cognitive ability, that successful parents may be able to pass on to their children. Although many recent studies have incorporated psychological variables into analyses of school and labor market outcomes, their impact on social and demographic behaviors remain largely unstudied by economists. This paper provides two alternative models of the impact of personality on the returns to marriage, and examines the empirical relationship between personality and relationship formation and dissolution for a large representative sample of German men and women. The results indicate that the determinants of marital surplus changed substantially between the cohorts of men and women born in the years after World War II and younger cohorts born in the 1960s in a manner consistent with declining gender specialization in households.

The formation and dissolution of marital and cohabiting relationships have important implications for individual wellbeing and for society. Stable partnerships are associated with higher incomes, improved health and happiness, and positive child outcomes. We know that economic factors such as education and market wages are predictive of age at marriage and the probability of divorce, but they leave a great deal of individual demographic variation unexplained. Psychologists and sociologists have examined the relationship between psychological traits and family outcomes such as marital satisfaction and fertility, but most of these analyses are based on relatively small samples. The recent availability of psychological variables in large representative surveys

such as the German Socio-economic Panel Study and the British Household Panel Study present new opportunities for economists and other social scientists to study their association with a wide range of lifetime experiences, and to consider the implications of these relationships for how we model the formation and stability of families and the living arrangements of children.

This paper uses data from the German Socio-economic Panel Study (SOEP), which contains a wide array of psychological and preference indicators (most gathered in recent waves of the survey), and relates these to simple lifecycle demographic outcomes for cohorts up to age 59 in 2005. Measured personality and other psychological traits are interpreted as indicators of preferences and capabilities that shape the returns to marriage and the ability of partners to solve problems and make long-term commitments. Economic models of marriage and divorce postulate that decisions to form and dissolve intimate unions are driven by the expected and realized surplus to marriage, compared with single life. These returns to marriage and cohabitation are derived from a combination of production complementarities (returns to specialization and exchange) that are enhanced by the mating of individuals with different capabilities (Becker, 1981) and consumption complementarities (joint public goods consumption) that are greatest if individuals with similar preferences are matched (Lam, 1988; Stevenson and Wolfers, 2007). If personality traits are predictive of the returns to marriage, either through domestic productivity or tastes for household public goods, then they should also predict individual selection into and out of marriage. Thus the empirical relationship between personality traits and demographic outcomes may be informative, both about the relative significance of consumption-based and production-based gains to marriage and about the economic interpretation of personality.

As noted by Borghans et al. (2008), personality traits seem, intuitively, to be related both to preferences (conscientious people place a high value on order, and extraverts prefer social interaction to solitude) and to capabilities (conscientious people are self-disciplined; introverts perform poorly in sales jobs). I find evidence both of common factors in the sorting of men and women into marriage and divorce (openness to experience and conscientiousness), which suggests that these traits are preference

indicators, and of distinct sources of marital surplus for men and women in the older cohorts (agreeableness increases the probability of marriage for women and decreases marriage for men) that may reflect gender specialization in marital production. These differences suggest that, for German men and women born before 1960, contributions to marital surplus were gender specialized, with men providing material and women emotional contributions to their joint domestic enterprise. In general, the results indicate that personality traits affect marital surplus, and that the principal sources of marital surplus changed from gender-specialized domestic production for post-war birth cohorts of men and women to joint consumption for younger cohorts born in the 1960s.

2. Economics and personality

Beginning with Bowles and Gintis (1976), economists have recognized that earnings and other labor market outcomes depend on worker attributes other than formal education, work experience, and cognitive skills—that, as Heckman, Stixrud, and Urzua (2006) note: "personality, persistence, motivation, and charm matter for success in life."[1] In recent years, Heckman and a number of collaborators have worked to incorporate "non-cognitive skills," including personality traits, into the economic analysis of individual achievement. Heckman et al. show that psychological traits are important determinants of labor market success. They estimate a model with one cognitive and one non-cognitive latent factor[2] in the individual determinants of wages, schooling, and risky behavior by youth in the National Longitudinal Survey of Youth, 1979, and find that the two factors have effects of similar magnitude on these outcomes. Personality traits are often included in the long list of psychological measures that are treated as indicators of non-cognitive skills.

[1] For example, Weiss (1988) found that the return to high school graduation among a set of production workers was attributable to a reduced propensity to quit or be absent, rather than greater skill. Duncan and Dunifon (1998) show that a set of motivational and social factors measured for young men in the PSID are as important as completed schooling in explaining labor market success 15 to 25 years later. Kuhn and Weinberger (2005) document a positive relationship between leadership skills in high school and adult wages for men.

[2] Heckman et al. use the Rotter locus of control scale and the Rosenberg Self-Esteem scale as indicators of non-cognitive skills.

Personality inventories and other measures designed and validated by psychologists are increasingly available, usually in the form of brief self-reported questionnaires, on large representative surveys such as the British Household Panel Survey and the German Socio-economic Panel Study (SOEP). The SOEP 2005 survey includes a version of the widely-used "Big Five" personality inventory. The Big Five factors are Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism, and they are defined as follows by Hogan and Hogan (2007):

Openness vs. closedness to experience: The degree to which a person needs intellectual stimulation, change and variety.

Conscientiousness vs. lack of direction: The degree to which a person is willing to comply with conventional rules and norms.

Agreeableness vs. antagonism: The degree to which a person needs pleasant and harmonious relations with others.

Extraversion vs. introversion: The degree to which a person needs attention and social interaction.

Neuroticism vs. emotional stability: The degree to which a person experiences the world as threatening and beyond his or her control.

Personality inventories are intended to be descriptive of stable differences in individual dispositions. There are many alternative taxonomies, but the Big Five are broadly accepted as a consistent and reliable categorization of attributes that people find "important and useful in daily interactions" (Goldberg, 1981). In an evolutionary context, the five-factor model may identify individual variations on behavioral dimensions that are significant to human social acceptance and status in groups. McAdam and Pals (2006) identify these facets of social interaction and their associated personality traits as social dominance (extraversion), negativity and instability (neuroticism), cooperation (agreeableness), trust and commitment (conscientiousness), and openness to change and learning (openness to experience). At a more micro-level, these modes of interaction are also relevant to mating and successful pair-bonding—a conscientious mate will be more trustworthy and more likely to fulfill a marital commitment.

Each personality trait incorporates a variety of detailed attributes that tend to be correlated, and "the Big 5 are fairly independent dimensions that can be measured with convergent and discriminant validity" (John and Srivasta, 1999). There is a long history, as with most psychological measures, of testing for internal validity, but external validity assessments are more limited, and tend to be focused on small samples. Recent reviews by Roberts et al. (2007) and Ozer and Benet-Martinez (2006), however, emphasize the ability of personality traits to predict important life outcomes, including health and happiness, the quality of peer and romantic relationships, and occupational choice.

A recent literature in economics has examined the cross-sectional relationship between personality indicators and labor market outcomes on large representative surveys. Mueller and Plug (2006) find that antagonism and emotional stability increase men's earnings, while conscientiousness and openness increase women's. Heineck and Anger (2008) examine the effects of cognitive abilities and psychological traits (including positive and negative reciprocity and locus of control as well as personality) on earnings in Germany and find that, though the effects of personality on men's and women's earnings are not uniform, both experience a wage penalty for an external locus of control. Heineck (2007) finds wage penalties for neuroticism and agreeableness for both male and female workers in the U.K. Using Dutch data, Nyhus and Pons (2005) find that emotional stability is positively related to the wages of men and women, while agreeableness is associated with lower wages for women. The returns to personality factors vary both by tenure and by educational group, suggesting that different personality traits may enhance productivity in different occupations.

The effect of personality on demographic outcomes in large samples is almost unexplored, with the exception of some recent studies of fertility and fertility timing. Jokela et al. (2009) review a small literature in psychology on personality and childbearing and examine the relationship between personality and parenthood using a large longitudinal survey (N=1,839) of young Finns. They find that emotionality (related to neuroticism) and sociability (related to extraversion) are associated with the probability of having children for both men and women. Tavares (2010) examines the relationship between Big Five personality traits and age at first birth for women in the British

Household Panel Survey and finds that agreeableness, extraversion, and neuroticism accelerate childbearing, while conscientiousness and openness delay it.[3]

One issue in treating personality as a causal determinant of labor market success or family behavior concerns the stability of personality traits over the adult lifecycle and their responsiveness to experience. There is considerable evidence of some systematic changes in personality traits with age—conscientiousness increases and extraversion decreases with age, for example. The rank-ordering of individuals is quite stable over time however and, though there is some instability in early adulthood (Roberts and DelVecchio, 2000),[4] temporal correlations in longitudinal studies commonly exceed 0.9 (Costa and McCrae, 1997). Caspi and Herbener (1990) argue that this stability may be endogenous: individuals choose situations compatible with their dispositions, such as assortative mating, and therefore maintain considerable personality stability over a lifetime. According to Caprara and Cervone (2000), "the relative stability of adults' self-reports is one of the most robust findings in the personality psychology literature" (p. 146).[5]

As psychological traits such as conscientiousness and self-esteem are shown to be important determinants of economic behaviors and outcomes, and to have strong intergenerational correlations, research in economics on the determinants and stability of these characteristics is likely to increase. The role of parents and educational institutions in fostering personality and motivational traits that enhance individual welfare is now an important component of research on the intergenerational transmission of inequality, and we can expect the relationship between personality, preferences, and economic behavior to be part of the increasing dialogue between economists and psychologists. A number of large population surveys now include standard psychological measures such as locus of control and preference indicators. The German SOEP has been particularly innovative in developing psychological measures that can be implemented in a large survey, and in

[3] Plotnick (1992) finds that self-esteem and, to a lesser extent, locus of control, affect premarital childbearing in the United States.
[4] It is not clear, however, to what extent personality changes are due to maturation, or are a response to changing circumstances. A longitudinal study of young adults (Magnus et al., 1993) found that personality was predictive of future life events, but that life events had no influence on personality measures.
[5] However, Jokela et al. find that having children increased levels of emotionality, particularly in participants with high baseline emotionality, over the nine years of the longitudinal Finnish study discussed above.

recent years has collected information on risk aversion, locus of control, willingness to trust others, positive reciprocity and negative reciprocity, as well as personality.

It is not obvious how to incorporate many of the standard psycho-social constructs, including personality, into an economic model of constrained choice and the existing empirical studies by economists do not attempt to do so in general. Tavares (2010) interprets the correlations she finds between personality and fertility timing as reflective of individual women's underlying preferences and motivations for childbearing. In an ambitious paper, Borghans, Duckworth, Heckman, and ter Weel (2008) discuss "the relevance of personality to economics and the relevance of economics to personality psychology." They provide some analytic frameworks for linking personality psychology and economics and argue that personality traits, as well as cognitive ability, may impose constraints on individual choices and, in turn, "conventional economic preference parameters can be interpreted as consequences of these constraints" (p. 997). As an example, they note that high rates of time preference may be caused by an individual's inability to delay gratification, or by an inability to imagine the future. In this paper, I develop two models of personality and marital surplus that incorporate both the preference and the constraint interpretation of personality variation. In the first, personality affects individual tastes for a household public good and, in the second, personality reflects productive capabilities. These models have distinct empirical implications for the relationship between personality and marriage behavior.

3. Marriage and Divorce

Patterns of family formation and dissolution have changed substantially since 1950 in most wealthy market economies. Marriage and childbearing have been delayed, cohabitation rather than formal marriage is increasingly prevalent, and partnerships are less stable. In a social environment in which marriage is no longer universal, family roles are more transitory, and gender roles are less distinct, community constraints on family arrangements tend to weaken. This erosion of social norms concerning traditional family arrangements can be expected to increase the marginal impact of individual characteristics on cohabitation, age at marriage and divorce. For example, education had no significant

association with the marital status of men in the U. S. Panel Study of Income Dynamics in 1970 but by 2001, when the proportion married was much smaller, marriage and education had a strong positive correlation (Lundberg, 2005). Similarly, increasing levels of discretion in family arrangements should lead to a greater role for personality and preferences in explaining family behavior (Tavares, 2010). The same argument, applied across space rather than across time, suggests that the factors driving family structure and demographic behavior should vary across societies with different institutional and economic environments. Since union formation and dissolution are strongly linked to the lifetime wellbeing of men, women, and children, understanding the determinants of an individual's family status becomes more significant and salient for policy.

Marriage. Economists consider marriage (and domestic partnership in general) to be the outcome of choices by individuals who expect to enjoy private gains from the establishment of a joint household. Since men and women decide to marry on the basis of a comparison of their expected utility in two states—married and single—the decision depends both on the magnitude of the expected marital surplus and on the partners' ability to make a credible commitment regarding the division of the surplus.[6] The gains from marriage arise from joint production and consumption in the household, and have several distinct sources. Production-based gains come from economies of scale and from the returns to specialization and exchange within the household; consumption benefits arise from risk pooling, the joint consumption of household public goods (including children), and the direct utility of time spent together.

A focus on production complementarities and specialization within the household leads to the standard prediction that there should be negative assortative mating based on market wages (Becker, 1981), so that the hard-driving careerist marries the happy homemaker. The gains to matching individuals with complementary skills should also apply to other individual capabilities relevant to household production—there will be potential gains to the marriage of an accomplished cook to a keen gardener. 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

[6] For a treatment of marital decisions with imperfect commitment, see Lundberg and Pollak (2003).

become more important sources of the gains to marriage (Lam, 1988; Stevenson and Wolfers, 2007). This implies that positive assortative mating on traits related to preferences for household consumption—a shared interest in children, modern art, or loud parties, for example—should have become increasingly important.

Individual variation in both preferences and capabilities can be reflected in measured psychological characteristics, including personality. The two types of economic interaction that create marital surplus—household production and joint consumption—have contrasting implications for how individual traits affect the decision to marry. If a personality trait has a similar impact on marital surplus, and therefore on the probability of marriage, for both men and women, we can infer that it is related to consumption benefits, and therefore to individual preferences. If gender-based specialization is an important source of marital surplus, however, we would expect different capabilities to promote the marriages of men and women. If psychological traits primarily reflect individual capabilities rather than preferences, then trait effects on marriage will differ by gender. Two simple models illustrate these points.

Marital Consumption. Suppose, first of all, that the gains to marriage depend on the joint consumption of a marriage-specific public good that is purchased in the market. Each individual *i* in a prospective couple has a utility function that depends on consumption of a household public good, Q, and a private good, x_i. Let preferences take the form:

$$U_i(Q, x_i) = A(Q)x_i + B_i(Q)$$

which permits utility to be transferable within the household through reallocations of the private good (Bergstrom and Cornes, 1983). A married couple consisting of person 1 and person 2 is assumed make decisions cooperatively and, with transferable utility, the efficient level of the household public good is independent of the distribution of income that household bargaining determines. The optimal value of Q satisfies the Samuelson condition

$$MRS_1 + MRS_2 = A'(Q)(x_1 + x_2) + B'_1(Q) + B'_2(Q) = p$$

and the pooled household budget constraint $x_1 + x_2 + pQ = Y_1 + Y_2$ where Y_i is the exogenous income of individual *i*. For simplicity, let $B_i(Q) = \beta_i Q$ so that a single parameter

defines individual preferences for the household public good. Substituting the budget constraint into the Samuelson condition implies Q as a function of income, prices, and the preference parameters and, not surprisingly, Q is increasing in β_1 and β_2.

Let utility when married include a direct return to marriage, c_i^m, that is randomly distributed over the population, may be positive or negative, and is independent of partner's characteristics. Single individuals are assumed to have the same preferences as married individuals, but we assume that single households do not consume any of the public good, so that all income is spent on the private good. If $A(0) = 1$, then single utility is $U_i^s(Y_i) = Y_i$.

This implies that total marital surplus for the couple will be

$$S = U_1^m + U_2^m - U_1^s - U_2^s = A(Q)(x_1 + x_2) + (\beta_1 + \beta_2)Q + c_1^m + c_2^m - Y_1 - Y_2 \,.$$

and individuals 1 and 2 will marry if $S > 0$. In a general model with transferable utility in which potential spouses vary only in wealth, Lam (1988) shows that there will be positive assortative mating on wealth, since there are positive returns to choosing a spouse with similar demands for the public good. We are concerned here with preferences rather than wealth, and marital surplus is increasing in both β_1 and β_2, the relative preferences for the marriage-exclusive public good.

Suppose that a personality trait z_0 influences preferences so that $\beta_i(z_{0i})$ and $\frac{\partial \beta}{\partial z_0} > 0$. In this case, household public goods and total marital surplus will be increasing in z_0 for both men and women. For a woman with personality z_{01}^*, there will be some value of a potential partner's trait $\bar{z}_{02}(z_{01}^*)$ such that $S \geq 0$ for all partners for whom $z_{02} \geq \bar{z}_{02}$. If there is random matching in the marriage market, then the probability that this woman marries is equal to the probability that a randomly-selected partner has personality trait $z_{02} \geq \bar{z}_{02}$, and this probability will be increasing in the value of her personality trait. Therefore, individuals with greater preferences for marital public goods are more likely to marry. With assortative matching, the marginal effect of z_0 on the probability of marriage will be even stronger. Men and women with high relative preferences for jointly-consumed goods such as children, companionship, and conformance with social conventions will tend

to marry or cohabit with like-minded individuals rather than remain single. If consumption complementarities are the principal source of gains to marriage, we should observe similar patterns of selection into marriage by personality for men and for women.

Marital Production. Production complementarities in the household, on the other hand, imply differential selection into marriage for men and women. Suppose that, instead of being purchased in the market, the marital public good is produced in the household with inputs of spousal time, $t = \propto_1 t_1 + \propto_2 t_2$, and purchased goods, G, so that $Q = F(t, G)$. Individual time endowments, T, are allocated to household production time and market work (h_i), which is compensated at fixed wage rates (w_i). As in the previous model, a cooperative couple chooses the efficient level of the public good, in this case subject to the production function and the time and budget constraints:

$$T = t_1 + h_1 = t_2 + h_2$$

$$w_1 h_1 + w_2 h_2 = x_1 + x_2 + p_G G$$

This is Becker's model of household production, and since the time of persons 1 and 2 are perfect (quality-adjusted) substitutes in both home and market work, it leads to complete specialization—the husband and wife will not both supply positive hours to the home and market sectors.

Suppose that market productivity w is enhanced by a personality trait, z_a--conscientiousness, for example—and home productivity α is increasing in a different trait, z_b. In a labor market with a substantial gender gap in wage schedules such that $w_2(\bar{z}_a) > w_1(\bar{z}_a)$, women will tend to specialize in household activities and men in market activities unless their relative endowments of productivity-enhancing traits is strongly skewed towards the other sector. Marital surplus will clearly be increasing in z_b, since it increases the productivity of time spent in production of the marital public good. In general, a z_a-induced increase in wage rates will have both income and substitution effects on the production of Q, but in a specialized household increases in men's wages will increase marital surplus. Also, if men do no housework, their endowment of z_b will not influence their selection into marriage. With random marital matching, women's probability of marriage will be increasing in z_b and men's marriage probability will be

increasing in z_a. Since these traits are complements in production, assortative matching will increase the marginal effect of each trait on marital surplus, and increase this dependence of marriage probabilities on distinct male and female traits.

Production complementarities and consumption complementarities therefore imply different patterns of selection into marriage for men and women, if specialization in household production is gender-based. Over time, we can expect the differential selection of men and women into marriage that the household production model predicts to decrease for two reasons. One, changes in the relative price of home time and market substitutes have reduced the importance of household production, relative to joint consumption, as a source of marital surplus. As wage rates rise and the price of market inputs falls, efficient household production has become more goods-intensive and this "marketization" of household activities should cause the influence of personality traits that affect sector-specific productivity to fall. Two, decreased gender discrimination in labor markets and weakening social norms that restrict women to the home sphere imply that the determinants of marital surplus will be less gender-specific.

In these one-period models, the production and consumption benefits of marriage are directly related to coresidence and joint parenthood, and need not require legal marriage. However, a full realization of the gains to specialization and to childrearing relies on a long-term commitment (Lundberg, 2008). For this reason, characteristics that enhance an individual's ability to make credible intertemporal commitments (such as conscientiousness or trustworthiness) and to negotiate effectively may also lead to a higher probability of marriage for both men and women.

There is substantial empirical evidence that potential gains to specialization affect the propensity to marry, even though there is strong positive assortative mating on a variety of individual characteristics, including education, wages, religion, and ethnicity. For example, Raymo, Goyette, and Thornton (2003) show that potential earnings increase the likelihood of marriage for men, but not women. At present, there is very little evidence based on large samples about the relationship between personality and preferences measures and the probability of marriage. Two exceptions are Spivey (2007) and Schmidt (2008) who show that risk aversion is positively related to transitions to marriage in the

NLSY and PSID. This result is consistent with a search framework in which individuals with higher levels of risk aversion will set a lower reservation level for spousal quality, and with marriage as a risk-pooling arrangement. An extensive literature in psychology, most using small samples, examines the impact of personality on marital processes, such as marital satisfaction,[7] but not on the probability of marriage.

Divorce. The essence of the economic theory of divorce is stated in the classic paper by Becker, Landes and Michael (1977)—a couple divorces when they have "less favorable outcomes from their marriage than they expected when marrying" (p. 1142). Members of a newly-married couple will be uncertain about each other's true nature and the characteristics of their future children, about their future earnings prospects and health conditions. As information about the quality of their match and the value of their alternatives arrives, surprises can lead to a dissipation of the marital surplus and divorce. For example, Weiss and Willis (1997) find that negative shocks to men's earnings (but not women's earnings) increase divorce probabilities. Charles and Stephens (2004) show that the information content of an earnings shock may be more important than the shock itself. They find that the divorce hazard rises after a spouse's job displacement but not after a disabling health shock, and that job loss only increases divorce if it is due to a layoff, not a plant closing.

If legal restrictions or social norms make divorce costly, then marital dissolution will only occur if shocks to the perceived quality of this marriage or the attractiveness of alternative partners renders marital surplus sufficiently negative that it is worthwhile to pay these costs. Individual commitment to marriage can also be thought of as a source of (psychic) divorce costs that make dissolution less likely. If surprises arrive that leave marital surplus positive but that change the value of marital alternatives for one partner, some redistribution may be required to maintain the marriage with positive surplus for both partners. Peters (1986) shows that, if the marital surplus cannot be reallocated (due, for example, to asymmetric information) then 'inefficient' divorces may occur.

[7] This is discussed in the next section on divorce.

In general, then, we would expect divorce to be more likely when marital surplus and divorce costs (or commitment) are low, when the cost of renegotiating the marital contract following shocks is high, and when alternative relationships are more readily available. In terms of individual traits, this suggests that individuals who are more impulsive and desirous of variety (openness), more extraverted, less conscientious and less risk-averse may be more likely to divorce.[8] Environment as well as individual traits may also be important for the arrival of alternative partnership opportunities—McKinnish (2004) shows that workplace contact between men and women appears to increase divorce. Finally, neuroticism and negative reciprocity may inhibit negotiation and make an individual more divorce-prone.

There is some support for these hypotheses in psychological studies. In a sample of 431 male physicians, McCranie and Kahan (1986) found that socially non-conforming, impulsive, risk-taking, stimulus-seeking men were more likely to have multiple divorces. In terms of the Big 5 traits, this would lead us to expect that low conscientiousness, high openness to experience, and low risk-aversion are associated with a high probability of divorce. Lowell and Conley (1987) follow a panel of couples from 1930 to 1980 and show that marital instability is related to neuroticism and to the husband's poor impulse control. Kinnunen et al. (2000) find that marital instability at age 36 is predicted by personality characteristics measured at age 27, including low agreeableness in women and extraversion and low conscientiousness in men. A comprehensive review of this literature by Roberts et al. (2007) finds consistent effects of neuroticism, agreeableness, and conscientiousness on divorce and concludes that the likely explanation for this association is that "personality helps shape the quality of long-term relationships" (p. 327).

[8] Light and Ahn (forthcoming) find that risk tolerance is strongly related to the probability of divorce in the NLSY79 sample, and that this effect is much larger for women.

4. Data and Measures

This study uses data from the German Socio-economic Panel Study (SOEP), a representative longitudinal survey of households and individuals in Germany. The initial wave of the survey was conducted in 1984, and consisted of 12,000 randomly-selected respondents in West Germany in 1984. In 1990, following re-unification, a sample from East Germany was added, followed by a sample of immigrants in 1994. Several additional samples have been added in subsequent years, and sample weights are used in all analyses.

The analysis sample is derived from the Scientific Use File of SOEP, and consists of 7,106 household heads, spouses, and partners aged 35 to 59 in 2005. Results are presented for the full sample and separately for two birth cohorts—men and women born between 1945 and 1959 (old), and those born between 1960 and 1970 (young). Fertility rates fell rapidly in the early 1970s in Germany (from about 2.0 to 1.5 between 1970 and 1975) and have declined only modestly since then, so the younger cohorts would have reached adolescence and made education decisions in a very low fertility environment. Overall employment rates for women in Germany, however, did not begin to increase substantially until the late 1990s,[9] so even the younger cohorts reached adulthood facing a labor market in which maternal labor supply was very low. The SOEP conducts a separate interview with each member of a household over age 17, so that all information is self-reported. Table 1 presents means and standard deviations for key variables.

The key dependent variables are life-cycle family outcomes that can be observed for these birth cohorts--ever-married by age 35 and whether the first marriage ended in divorce by the end of the sample period. Table 1 also reports the proportion of each cohort married by age 25 and the mean age at first marriage. These variables are constructed from the Marital Biography File, and do not distinguish between legal marriage and cohabitation—both are termed "marriage." Despite the inclusion of cohabitation in this measure, the older cohorts "married" earlier than the young cohorts. The mean age at first marriage is 23 for the older women and 26 for the older men, compared to 24.7 for the young women and 27.4 for the young men. Marriage rates are very high for the older

[9] With the exception of the increase in women's employment rates due to unification with East Germany, which had much higher rates of female labor force participation.

cohorts (91 and 86 percent for women and men, respectively) and even for men in the younger cohorts, 77 percent have married/cohabited by age 35. About one-quarter of the ever-married older cohorts experienced a divorce from their first marriage by 2005, compared to 24 percent of the young women and 18 percent of the young men. The younger cohorts are less likely to have divorced, probably because the elapsed time between their marriage date and the end of the sample period is much shorter—an average of 13 to 16 years versus 26 to 29 years for the older cohorts.

Mean years of education are roughly constant across cohorts for men, but increase from 12 years to 12.4 years for women. The labor force participation rate for women, defined as the proportion of the sample with positive labor income in 2005, is only slightly higher for the younger cohorts (63 percent versus 61 percent for the older cohorts), but many of them still have young children at home in 2005. Many of the younger women who do work do so part-time and their total earnings are lower, both in absolute terms and relative to male earnings, than the earnings of the older female cohorts. Even though we might expect the better-educated women born after 1960 to have a greater lifetime attachment to the labor force than those born in the post-war years, the low rates of maternal employment in Germany imply that only a very small decrease in gender specialization across cohorts is apparent at this point in the lifecycle. Additional control variables include dummies for German ethnicity, for inclusion in the East German sample, and for the report of some religion (vs. "none").

The main independent variables are the Big Five personality traits—openness to experience, agreeableness, extraversion, neuroticism, and conscientiousness. Some of the personality variables vary systematically by age, particularly in early adulthood. Since the personality inventory was included in the 2005 wave of the survey for all cohorts, we cannot separate age and cohort effects, but the age pattern in the mean raw scores for men and women age 18 to 64 in SOEP (see Figure 1) is similar to that found in other studies. The personality scores included in the marriage and divorce models have been age-normed.

Also included in some models are other psychological and preference variables collected in recent waves of SOEP: risk aversion (2004), locus of control (2005)

(essentially, the extent to which an individual believes that what happens to him is under his control, rather than due to external forces), willingness to trust others (2003), positive reciprocity (2005), and negative reciprocity (2005). Some of these measures, such as risk aversion, have been used extensively in other economic studies, and their inclusion provides a test for the stability of the personality effects. The questions that these, and the Big Five personality traits, are based on are presented in Table 2. The validity of some of the SOEP survey-based preference instruments has been examined by linking individual responses to reported behavior in particular domains or to behavior in incentivized experiments. Dohmen et al. (2005) show that the SOEP risk aversion measure predicts risk-taking behavior in investment, career choice, smoking, and other domains.[10] Fehr et al. (2003) show that responses to the trust questions predict trust game behavior in a field experiment.

One issue in the interpretation of these models concerns possible endogeneity of personality and other traits with respect to an individual's family history. The determinants and stability of personality traits has received a great deal of attention from psychologists, but little is known about the effect of life experiences on adult personalities. As noted above, rank-orderings of personality appear to be quite stable over adult life and a limited amoung of longitudinal research has suggested that personality is not affected by major life events.[11] Direct analysis of reverse causality will have to wait until the SOEP personality inventory is repeated in future waves, but one comparison of personality profiles in subpopulations of the SOEP is encouraging. If we compare the original West German sample with the East German sample added in 1990, the means of most personality traits are not significantly different, though these populations have been subject to very different social and economic environments since childhood. [12]

[10] Risk aversion plays a very specific role in models of economic behavior, and the SOEP measure has been used to empirically test the hypothesized role of risk aversion in the determination of reservation wages (Pannenberg, 2007) and trade union membership (Goerke and Pannenberg, 2008).
[11] The life events included in the study by Magnus et al. (1993) included marriage and divorce/separation, but their analysis of causality between personality and experiences aggregated a large number of positive and negative events.
[12] The East German sample is significantly more conscientious than the West German sample ($p=0.01$) and more neurotic ($p=0.05$).

Table 1: Sample Means

	Women			Men		
	Full Sample	**Older Cohorts: 1945-1959**	**Younger Cohorts: 1960-1970**	**Full Sample**	**Older Cohorts: 1945-1959**	**Younger Cohorts: 1960-1970**
Ever Married by Age 25	0.65	0.74	0.56	0.45	0.55	0.34
Ever Married by Age 35	0.88	0.91	0.85	0.82	0.86	0.77
Age at First Marriage	23.8	23.0	24.7	26.6	26.0	27.4
Ever Divorced (1st marriage)	0.24	0.24	0.24	0.22	0.25	0.18
Age in 2005	46.5	51.7	40.7	46.6	51.9	40.6
Years of Education	12.2	12.0	12.4	12.5	12.4	12.5
Labor income 2005*	1775	1869	1674	2469	2314	2528
Labor force participation 2005	0.62	0.61	0.63			
Some religion reported	0.67	0.66	0.68	0.61	0.61	0.60
German ethnicity	0.97	0.97	0.96	0.97	0.98	0.97
East Germany sample	0.18	0.19	0.17	0.18	0.19	0.16
Observations	3670	1918	1752	3436	1825	1611

* For women, labor force participants only.

Table 2: Personality traits and preferences, SOEP questions

Big Five: I see myself as someone who ... (7-point scale from 'applies to me perfectly' to 'does not apply to me at all')

is original, comes up with new ideas	Openness to Experience
values artistic experiences	Openness to Experience
has an active imagination	Openness to Experience
does a thorough job	Conscientiousness
does things effectively and efficiently	Conscientiousness
tends to be lazy (*reversed*)	Conscientiousness
is communicative, talkative	Extraversion
is outgoing, sociable	Extraversion
is reserved (*reversed*)	Extraversion
is sometimes somewhat rude to others (*reversed*)	Agreeableness
has a forgiving nature	Agreeableness
is considerate and kind to others	Agreeableness
worries a lot	Neuroticism
gets nervous easily	Neuroticism
is relaxed, handles stress well (*reversed*)	Neuroticism

Internal Locus of control (7-point scale from totally agree to totally disagree)

How my life goes depends on me

If a person is socially or politically active, he/she can have an effect on social conditions

One has to work hard in order to succeed

If I run up against difficulties in life, I often doubt my own abilities (*reversed*)

Compared to other people, I have not achieved what I deserve (*reversed*)

What a person achieves in life is above all a question of fate or luck (*reversed*)

I frequently have the experience that other people have a controlling influence over my life (*reversed*)

The opportunities that I have in life are determined by the social conditions (*reversed*)

Inborn abilities are more important than any efforts one can make (*reversed*)

Reciprocity (7-point scale from 'applies to me perfectly' to 'does not apply to me at all')

Positive reciprocity

If someone does me a favor, I am prepared to return it

I go out of my way to help somebody who has been kind to me

I am ready to undergo personal costs to help somebody who helped me

Negative reciprocity

If I suffer a serious wrong, I will take revenge as soon as possible, no matter what the cost

If somebody puts me in a difficult position, I will do the same to him/her

If somebody offends me, I will offend him/her back

Trust (4 point scale from totally agree to totally disagree)

On the whole one can trust people

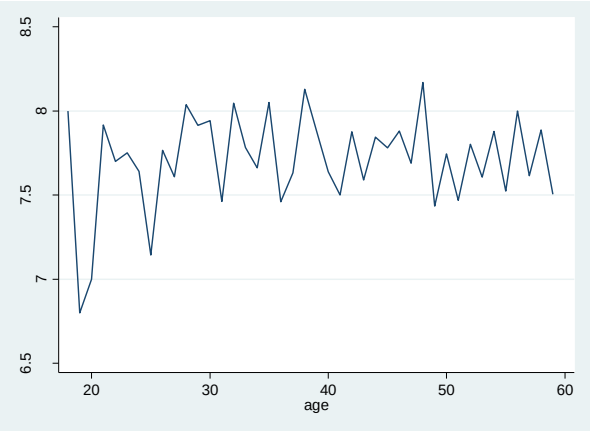
Nowadays one can't rely on anyone *(reversed)*

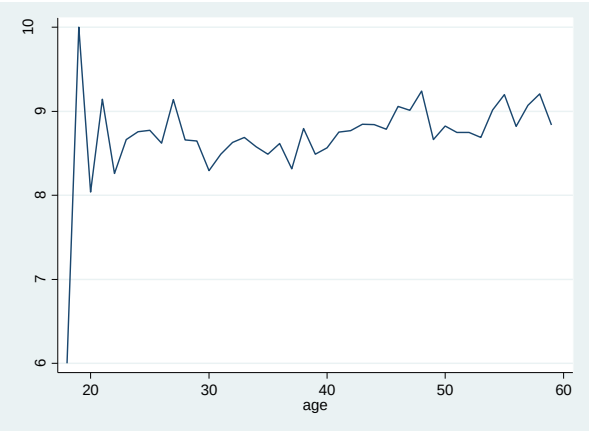
If one is dealing with strangers, it is better to be careful before one can trust them *(reversed)*

Risk aversion (10-point scale)

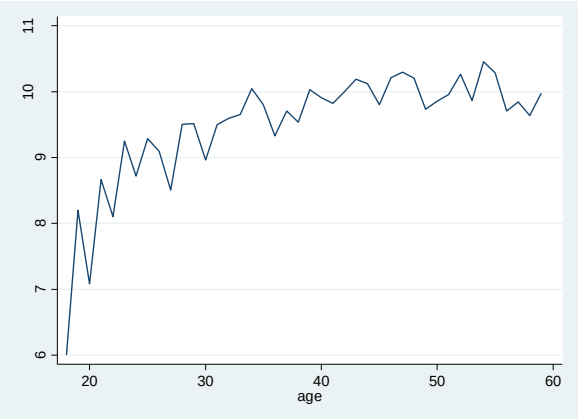
Are you generally a person who is fully prepared to take risks, or do you avoid taking risks?

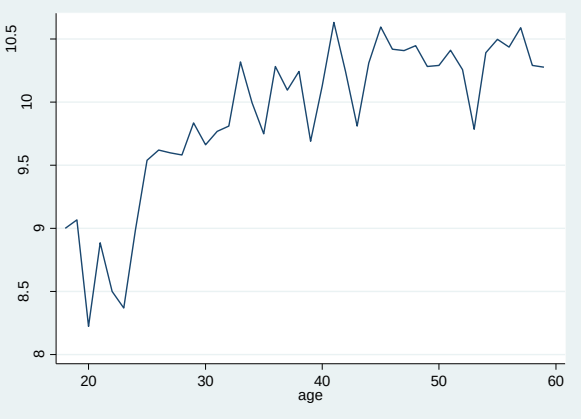
Figure 1: Personality Traits by Age: Raw scores



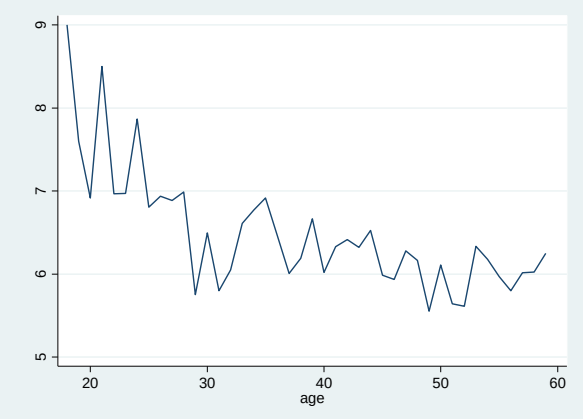


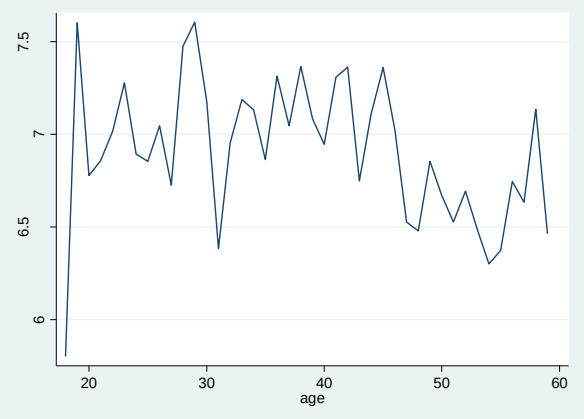
Men Agreeableness Women



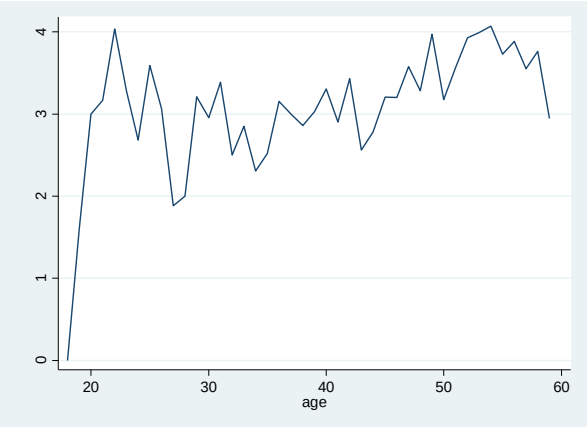


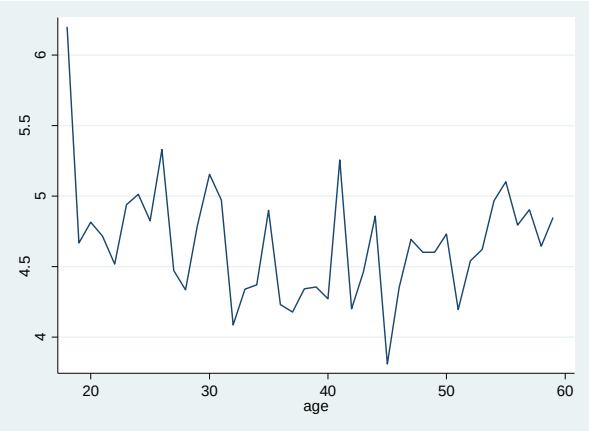
Men Conscientiousness Women



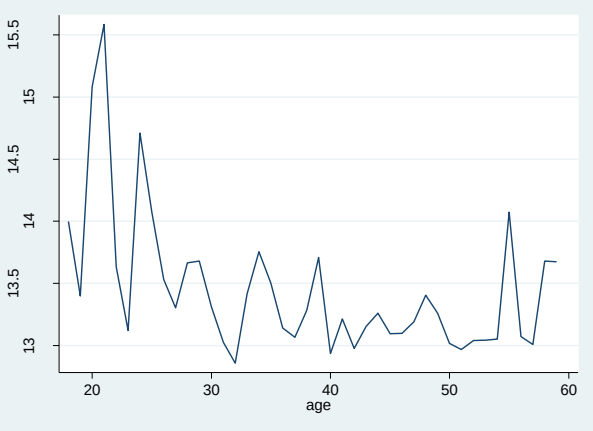


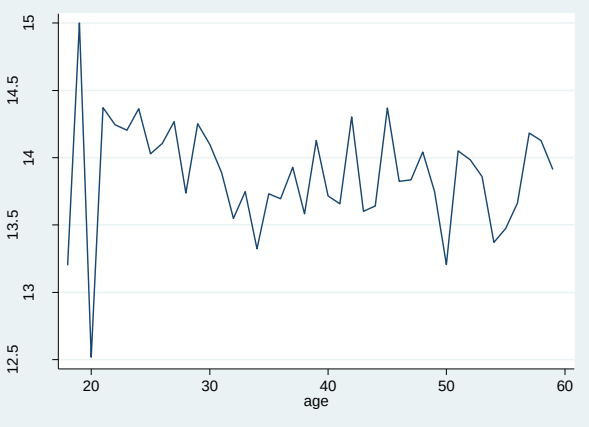
Men Extraversion Women





Men Neuroticism Women





Men Openness to Experience Women

5. Results

Marriage. Tables 4a reports the coefficients of a probit model in which the dependent variable is a dummy indicating whether the man or women was ever-married by age 35. [13] Included in the model are Big 5 personality traits (columns 1 and 3) and personality traits plus the five psychological/preference measures discussed in the previous section (columns 2 and 4). Also included in all models are years of education, a dummy for German ethnicity, a dummy for inclusion in the East German sample and a dummy for the reporting of some religious affiliation.

The effects of individual personality traits on the marriage probabilities of men and women are very different, though there is one common element—openness to experience decreases marriage for both men and women. Marriage for women is positively related to extraversion, agreeableness, and neuroticism, and the effects are robust to the inclusion of the other psychological and preference variables (none of which have significant effects on marriage) except that agreeableness not longer significant in the extended model. Marriage for men is positively related to conscientiousness and, when other psychological traits are included, to antagonism (the reverse of agreeableness) and internal locus of control. Education and German ethnicity reduce marriage probabilities for both men and women, and individuals in the East German sample are more likely to marry.[14]

Tables 4b and 4c report probit coefficients for the same models run separately on men and women in the older birth cohorts (1945-1959) and the younger cohorts (1960-1970). Some clear patterns emerge. In Table 4b, we can see that the effects of individual personality traits on the marriage probabilities of older cohorts of men and women are quite distinct, as predicted by the production complementarities model of marital surplus. Extraversion significantly increases the probability of marriage for both men and women, but there the similarities end. Conscientiousness increases the probability of marriage by age 35 for men, but not for women, and neuroticism is positively related to marriage for women but not for men. Agreeableness is significant for both, but with opposite signs—

[13] Probit models for marriage by age 25 yielded similar results for women but no significant psychological trait effects for men and are not reported.

[14] Family policy in the German Democratic Republic prior to 1989 encouraged early marriage and childbearing (Engelhardt et al., 2002).

agreeable women and antagonistic men are more likely to marry. In other studies (and in this sample as well) antagonism and conscientiousness are predictive of higher earnings, so that these effects on selection into marriage, combined with the selection of agreeable and neurotic (emotional) women, is evidence of specialized production in marriage.

The inclusion of other psychological traits in the marriage equation does not substantially alter this conclusion. The coefficients on men's personality traits are robust to the inclusion of these additional variables, but the effects of agreeableness and neuroticism on women's marriage probabilities are weakened somewhat. Positive reciprocity, which is strongly correlated with these personality traits, now has a positive and significant effect on marriage for women. In summary, men in the older cohort who marry by age 35 have a trait profile that is related to earnings power rather than interpersonal connection, compared to unmarried men. Combined with the selection of nurturing, sociable, and emotional women into marriage, these results are suggestive of continued specialization in the generation of marital surplus for post-war cohorts in Germany, with women making emotional and social contributions and men, material ones.

Table 4c repeats these analyses for the young cohorts born between 1960 and 1970. The vector of personality coefficients for men and women are remarkably similar (and, in fact, not significantly different from each other). Openness to experience has a large negative effect on the marriage probabilities of both men and women, and conscientiousness has a strong positive effect. At the means of the independent variables, a one standard deviation increase in openness reduces the probability of marriage by 8 percent for women and by 6 percent for men. A one standard deviation increase in conscientiousness increases marriage probabilities by 3 percent for women and 6 percent for men. These results indicate that a willingness to commit to a conventional long-term arrangement has become an important factor in the marriage decisions of both sexes. None of the other psychological traits have any significant impact on marriage, and the only notable change in the personality coefficients when they are included is the appearance of a significant negative effect of neuroticism for men. The strong consistency of the personality effects in marriage selection for men and women suggests that they are reflective of shared preferences for stable and conventional domestic arrangements.

Table 4a: The Probability of Marriage by Age 35: Full Sample
Probit Model

	Women		Men	
	1	2	3	4
Years of Education	-0.077**	-0.077**	-0.035**	-0.045**
	(0.018)	(0.019)	(0.016)	(0.017)
"Big 5" Personality Traits				
Openness to Experience	-0.041**	-0.042**	-0.035**	-0.027*
	(0.014)	(0.014)	(0.019)	(0.014)
Conscientiousness	0.030	0.027	0.051**	0.056**
	(0.019)	(0.020)	(0.022)	(0.017)
Extraversion	0.041**	0.043**	0.020	0.015
	(0.018)	(0.018)	(0.014)	(0.014)
Agreeableness	0.032**	0.026	-0.021	-0.027*
	(0.016)	(0.018)	(0.014)	(0.016)
Neuroticism	0.027**	0.028*	-0.001	-0.005
	(0.013)	(0.015)	(0.012)	(0.013)
Trusting		-0.006		-0.018
		(0.031)		(0.027)
Risk Aversion		0.030		-0.004
		(0.021)		(0.021)
Internal Locus of Control		0.010		0.012*
		(0.008)		(0.006)
Positive Reciprocity		0.022		-0.024
		(0.018)		(0.017)
Negative Reciprocity		0.002		0.005
		(0.012)		(0.010)
German Ethnicity	-0.874**	-0.834**	-0.433**	-0.413*
	(0.247)	(0.053)	(0.220)	(0.229)
East Germany	0.365**	0.346**	0.403**	0.447**
	(0.122)	(0.126)	(0.118)	(0.122)
Observations	3429	3241	3196	3056
Log likelihood	-1365.11	-1284. 57	-1742.76	-1657.27

Note: Numbers in ( ) are robust standard errors. Model also includes age in 2005 and a dummy variable for reported religious affiliation.
*=p<0.1, **=p<0.05.

Table 4b: The Probability of Marriage by Age 35: Old Cohorts
Probit Model

	Women		Men	
	1	2	3	4
Years of Education	-0.082**	-0.096**	-0.024	-0.035
	(0.025)	(0.026)	(0.024)	(0.023)
"Big 5" Personality Traits				
Openness to Experience	-0.011	-0.009	-0.028	-0.027
	(0.017)	(0.017)	(0.019)	(0.020)
Conscientiousness	-0.018	-0.020	0.054**	0.062**
	(0.019)	(0.030)	(0.022)	(0.023)
Extraversion	0.066**	0.064**	0.040**	0.036**
	(0.024)	(0.025)	(0.013)	(0.017)
Agreeableness	0.044**	0.031	-0.040**	-0.042*
	(0.022)	(0.024)	(0.020)	(0.022)
Neuroticism	0.037**	0.021	0.011	0.023
	(0.017)	(0.019)	(0.017)	(0.018)
Trusting		-0.036		0.001
		(0.041)		(0.037)
Risk Aversion		0.026		-0.032
		(0.030)		(0.030)
Internal Locus of Control		0.006		0.009
		(0.011)		(0.008)
Positive Reciprocity		0.052**		-0.023
		(0.026)		(0.023)
Negative Reciprocity		-0.000		0.010
		(0.017)		(0.015)
German Ethnicity	-0.551*	-0.477	-0.288	-0.271
	(0.313)	(0.053)	(0.315)	(0.329)
East Germany	0.526**	0.464**	0.431**	0.412**
	(0.189)	(0.196)	(0.166)	(0.166)
Observations	1800	1702	1696	1624
Log likelihood	-607.46	-565.75	-848.17	-814.64

Note: Numbers in ( ) are robust standard errors. Model also includes age in 2005 and a dummy variable for reported religious affiliation.
*=p<0.1, **=p<0.05.

Table 4c: The Probability of Marriage by Age 35: Young Cohorts
Probit Model

	Women		Men	
	1	2	3	4
Years of Education	-0.079**	-0.066**	-0.053**	-0.062**
	(0.023)	(0.024)	(0.021)	(0.022)
"Big 5" Personality Traits				
Openness to Experience	-0.062**	-0.069**	-0.046**	-0.035*
	(0.020)	(0.020)	(0.018)	(0.020)
Conscientiousness	0.069**	0.071**	0.047**	0.051**
	(0.025)	(0.025)	(0.023)	(0.025)
Extraversion	0.017	0.026	0.004	-0.001
	(0.021)	(0.022)	(0.020)	(0.021)
Agreeableness	0.028	0.030	-0.004	-0.016
	(0.022)	(0.024)	(0.020)	(0.022)
Neuroticism	0.020	0.034	-0.025	-0.032*
	(0.019)	(0.021)	(0.017)	(0.019)
Trusting		0.026		-0.036
		(0.040)		(0.037)
Risk Aversion		0.033		0.016
		(0.027)		(0.027)
Internal Locus of Control		0.011		0.012
		(0.009)		(0.009)
Positive Reciprocity		-0.006		-0.021
		(0.022)		(0.023)
Negative Reciprocity		0.006		-0.002
		(0.015)		(0.014)
German Ethnicity	-1.242**	-1.259**	-0.605**	-0.561*
	(0.341)	(0.358)	(0.302)	(0.315)
East Germany	0.224	0.253	0.400**	0.501**
	(0.163)	(0.169)	(0.166)	(0.176)
Observations	1629	1539	1500	1432
Log likelihood	-734.29	-691.47	-875.20	-817.86

Note: Numbers in ( ) are robust standard errors. Model also includes age in 2005 and a dummy variable for reported religious affiliation.
*=p<0.1, **=p<0.05.

Divorce. In Tables 5a, the hazard ratios for a Cox proportional hazards model of time to divorce for first marriages are reported for the full sample. The divorce models are more difficult to interpret than the marriage models in Table 4, primarily because the non-personality traits are more important determinants of divorce than of marriage, and some concerns about reverse causality arise for these variables. The most notable result is the very strong positive effect of openness to experience on the divorce probabilities of both men and women. For the combined cohorts, a one standard deviation increase in openness increases the divorce hazard by 12 percent for women and by 20 percent for men. The finding that openness, which is associated with a desire for variety and change, is a significant detriment to a stable marital arrangement suggests a re-interpretation of the "surprise" model of divorce.[15] That individuals have a taste for variety is a commonplace assumption, and the demand for variety in other spheres has been shown to be associated with income and education.[16] In intimate partnerships, it appears that a taste for variety may be destabilizing.

For men, extraversion as well as openness increases the probability of divorce, and conscientiousness decreases it. The conscientiousness result is consistent with the positive effect of this trait on marriage for men, and with an interpretation that conscientiousness increases marital surplus. However, the divorce models are not strictly reversals of the marriage results—the positive effect of male extraversion suggests that this trait may increase the productivity of searching for partners, thus increasing both marriage and divorce probabilities.

The personality-only model of divorce for the older cohorts of men (Table 5b) yield results that are very similar to those for the full sample—extraversion and openness significantly increase divorce, and conscientiousness decreases it. For women in the older cohorts, agreeableness has a negative effect on divorce, while neuroticism has a positive effect. Once again, these results are not consistent with a simple low-marital-surplus story about divorce, since neuroticism had positive effects on marriage.

[15] If the sample is split by education level (<12, =>12), the impact of openness on the probability of marriage by age 35 is much stronger for the high-education group, and is a significant determinant of divorce only among the low-education group.
[16] For example, Behrman and Deolalikar (1989) and Gronau and Hamermesh (2008).

Neuroticism/emotionality may have a negative effect on problem-solving within marriage, as well as a positive effect on preferences for marriage among women.

For the younger cohorts (Table 5c) there are no significant effects of personality on divorce, except a positive effect of openness to experience for women only. Openness has no significant impact on the probability of divorce for younger men—nor do any other psychological characteristics other than trust. A possible explanation for this is that we observe, on average, only the first 13 years of marriage for these men, and only 18 percent of them have divorced by this time (as opposed to one-quarter of the other cohort-sex groups).

In the full models that include additional psychological and preference variables we find that, particularly for the full sample, the personality coefficients are reasonably robust to the inclusion of these measures. An unwillingness to trust others increases the divorce propensity for all groups except the older men, though this trait did not affect the propensity to marry. This result raises some concerns about reverse causality: little is known about the temporal stability of this measure, and it seems possible that the experience of divorce might reduce trust. For all groups except the young men, the risk-loving are more likely to divorce.[17] The only other significant effects come in the divorce model for the younger cohorts of women. For this group, an internal locus of control and high levels of positive reciprocity tend to reduce the probability of divorce.

The dissolution of a first marriage or cohabitation appears to be related to three factors that are influenced by personality and other psychological traits: low marital surplus (openness, agreeableness), emotional stability/positive affect (neuroticism, positive reciprocity, locus of control), and the arrival and assessment of alternatives (extraversion, risk aversion). Emotional stability seems to be particularly salient for women, and the availability of alternatives for men.

[17] These results are consistent with the findings of Light and Ahn (2009).

Table 5a: Divorce Hazard Ratios for First Marriages—Full Sample

Cox proportional hazard model

	Women		Men	
	1	2	3	4
Years of Education	0.967	0.964	0.920**	0.943**
	(0.037)	(0.028)	(0.024)	(0.027)
"Big 5" Personality Traits				
Openness to Experience	1.039*	1.044**	1.048**	1.056**
	(0.023)	(0.018)	(0.019)	(0.019)
Conscientiousness	1.018	1.023	0.943**	0.944**
	(0.029)	(0.026)	(0.023)	(0.023)
Extraversion	1.031	1.013	1.045**	1.038*
	(0.019)	(0.017)	(0.020)	(0.021)
Agreeableness	0.987	1.005	0.996	1.020
	(0.019)	(0.023)	(0.024)	(0.028)
Neuroticism	1.024	1.009	0.994	0.979
	(0.016)	(0.015)	(0.016)	(0.017)
Trusting		0.912**		0.887**
		(0.034)		(0.033)
Risk Aversion		0.923**		0.968
		(0.024)		(0.030)
Internal Locus of Control		0.980**		0.998
		(0.009)		(0.009)
Positive Reciprocity		0.960		0.994
		(0.028)		(0.022)
Negative Reciprocity		1.012		1.016
		(0.015)		(0.016)
German Ethnicity	1.323	1.298	1.819*	1.957*
	(0.422)	(0.460)	(0.636)	(0.720)
East German	0.909	0.875	1.012	0.983
	(0.128)	(0.128)	(0.155)	(0.156)
Observations	3830	3626	3231	3099
Log likelihood	-7806.16	-7080.29	-5509.31	-5239.89

Note: Numbers in ( ) are robust standard errors. Model also includes age at first marriage, year of marriage, and dummy for reported religious affiliation.
*=p<0.1, **=p<0.05.

Table 5b: Divorce Hazard Ratios for First Marriages—Old Cohorts
Cox proportional hazard model

	Women		Men	
	1	2	3	4
Years of Education	1.048	1.018	0.920**	0.935**
	(0.042)	(0.031)	(0.029)	(0.029)
"Big 5" Personality Traits				
Openness to Experience	1.026	1.039*	1.076**	1.065**
	(0.029)	(0.022)	(0.024)	(0.023)
Conscientiousness	1.020	1.028	0.940*	0.947*
	(0.033)	(0.030)	(0.031)	(0.030)
Extraversion	1.023	1.009	1.053**	1.040
	(0.027)	(0.024)	(0.025)	(0.026)
Agreeableness	0.938**	0.960	0.993	1.018
	(0.024)	(0.025)	(0.031)	(0.031)
Neuroticism	1.037*	1.018	0.974	0.962*
	(0.020)	(0.020)	(0.020)	(0.022)
Trusting		0.913**		0.944
		(0.043)		(0.038)
Risk Aversion		0.927**		0.932*
		(0.026)		(0.034)
Internal Locus of Control		0.986		0.988
		(0.011)		(0.011)
Positive Reciprocity		0.994		0.984
		(0.026)		(0.026)
Negative Reciprocity		1.010		1.002
		(0.017)		(0.019)
German Ethnicity	1.203	1.271	1.388	1.344
	(0.417)	(0.461)	(0.727)	(0.724)
East German	0.841	0.871	0.991	0.928
	(0.165)	(0.170)	(0.192)	(0.180)
Observations	1688	1602	1563	1499
Log likelihood	-3471.66	-3271.62	-2940.85	-2849.41

Note: Numbers in ( ) are robust standard errors. Model also includes age at first marriage, year of marriage, and dummy for reported religious affiliation.
*=p<0.1, **=p<0.05.

Table 5c: Divorce Hazard Ratios for First Marriages—Young Cohorts
Cox proportional hazard model

	Women		Men	
	1	2	3	4
Years of Education	0.866**	0.893**	0.922*	0.979
	(0.042)	(0.045)	(0.042)	(0.051)
"Big 5" Personality Traits				
Openness to Experience	1.059**	1.052*	1.009	1.031
	(0.028)	(0.028)	(0.028)	(0.027)
Conscientiousness	1.009	1.008	0.958	0.952
	(0.043)	(0.039)	(0.033)	(0.036)
Extraversion	1.030	1.016	1.039	1.048
	(0.023)	(0.025)	(0.032)	(0.034)
Agreeableness	1.041	1.059	0.996	1.019
	(0.028)	(0.039)	(0.039)	(0.047)
Neuroticism	1.009	1.003	1.024	1.013
	(0.021)	(0.022)	(0.027)	(0.029)
Trusting		0.902*		0.791**
		(0.056)		(0.054)
Risk Aversion		0.923**		1.027
		(0.038)		(0.053)
Internal Locus of Control		0.975*		1.014
		(0.014)		(0.016)
Positive Reciprocity		0.923*		1.009
		(0.042)		(0.038)
Negative Reciprocity		1.013		1.041
		(0.026)		(0.027)
German Ethnicity	1.346	1.288	2.544*	3.082**
	(0.632)	(0.646)	(1.223)	(1.438)
East German	0.937	0.841	1.067	1.036
	(0.183)	(0.179)	(0.244)	(0.247)
Observations	2142	2024	1668	1600
Log likelihood	-3653.28	-3184.65	-2110.25	-1948.01

Note: Numbers in ( ) are robust standard errors. Model also includes age at first marriage, year of marriage, and dummy for reported religious affiliation.
*=p<0.1, **=p<0.05.

6. Conclusions

Evidence from the German Socio-economic Panel Study shows that several dimensions of personality are strongly associated with the propensity of men and women to marry and to divorce. For younger cohorts, born between 1960 and 1970, two personality traits (openness to experience and conscientiousness) have large and essentially identical effects on the probability that men and women marry by age 35. This is consistent with a model in which marital surplus depends on the joint consumption of public goods, and these personality traits appear to be associated with high demand for marital public goods. For older cohorts, born between 1945 and 1959, psychological traits have gender-distinct effects on marriage that suggest specialized production of marital services, with agreeable and emotional women, and conscientious, antagonistic men more likely to marry.

Openness to experience, which reflects a desire for variety and change as well as imagination and creativity, is strongly related to both long-term singlehood and to divorce for both men and women.[18] The divorce models indicate that, with a few exceptions, traits expected to contribute to marital surplus, based on the marriage models, also inhibit divorce. There is some evidence that divorce may also be driven by difficulties in problem-solving or negotiation, including a positive effect of neuroticism for older women and a negative effect of positive reciprocity for younger women. More notable are effects that seem consistent with the impact of openness to experience and suggest that a willingness to consider and seek out alternatives may increase the risk of divorce—the positive effects of risk tolerance and of male extraversion.

For the older cohorts, the determinants of marriage for men and women include some distinct differences that suggest marital surplus is related to nurturance by women and to men's stability and earnings. This pattern is consistent with the relatively conservative social environment in Germany, and with the persistence of traditional

[18] This result appears to be counter to most findings in the psychology literature. Ozer and Benet-Martinez (2006) note, in a survey that demonstrates the "ubiquity" of personality impacts on important outcomes, "openness has no well-documented effects in the interpersonal domain that we were able to locate' (p. 410).

gender roles reflected in the slow movement of women into the paid workforce in this country. However, the marriage models for younger cohorts indicate a pronounced change in the selection of men and women into marriage and cohabitation, with high levels of conscientiousness and a tolerance for lack of variety increasing the attractiveness of domestic partnerships for both sexes.

In general, these results indicate that personality traits measure aspects of individual preferences and capabilities that are important in generating positive returns to an intimate partnership such as marriage, and in maintaining marital stability. Further, the distinctly different patterns of selection by personality into marriage and divorce between older and younger cohorts of the German population are consistent with a rapid change in the nature of marriage—from an institution in which gender-specialized production and exchange is an important source of marital surplus to one in which the joint consumption of family public goods is paramount.

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