

# Psychology and Family Economics

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## 1. Introduction

In the past few decades, economic research has extended beyond the traditional areas defined by formal markets and explicit prices into realms of human behavior that were once the exclusive territory of other social sciences, such as discrimination, religion, and crime. Lazear (2000) labeled this expansion of the field “economic imperialism” and argued that applying the economic paradigm to a broad array of social behaviors has successfully generated new insights into important questions. One of the most successful of these territorial forays is the field highlighted in this conference: family economics. Becker’s *Treatise on the Family*, first published in 1981, was a landmark in the application of rational choice models and equilibrium analysis to marriage and divorce, the gender division of labor, and fertility, and presaged the development of a now extensive theoretical and empirical literature. From a vantage point within modern family economics, I’d like to point out a recent initiative that is acquiring new ground for economists, though it offers as many opportunities for collaboration as for conquest. Due to recent developments in several large representative surveys, we can appropriate a set of well-established psychological constructs for our own use. I am referring not to measures of happiness (or subjective wellbeing) but rather to psychosocial traits that can provide us with rich measures of individual preferences and capabilities. Population variation in traits such as personality can be used to develop improved economic models of behavior and better tests of existing ones.

In this paper, I would like to survey some aspects of these new opportunities, and provide some examples of how family economics can make use of data on psychological traits and the vast body of research in psychology that has devised and analyzed these traits. To that end, I will mention some of the new sources of data that have become available in large, population-representative samples in a number of countries. Next, I will review some of the work in economics that has made early use of the new data on personality, and then summarize some empirical results using the German Socio-Economic Panel Study that show the power of individual personality traits in predicting family behavior and illuminating the forces behind decisions to marry and to divorce. Finally, I want to make some general remarks about how we might incorporate data on personality into an economic analysis of families. In this, I will for the most part follow a neo-classical approach of assuming rational decisions about intimate partnerships, but will also point out some empirical patterns in the effects of psychosocial traits on marriage and divorce that suggest the advisability of a more behavioral approach. Departures from rationality due to limited cognition or limited self-control are likely to play an important role in family behavior, as well as in consumption and savings decisions.

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Family behavior has important implications for significant societal outcomes such as inequality and child wellbeing, and our understanding of the determinants of decisions about family arrangements is still limited. Researchers and policy makers have struggled to devise appropriate responses to family changes such as plummeting fertility in parts of Europe and the high-frequency partnering and re-partnering that has become characteristic of American family life. Research that takes seriously individual heterogeneity in motives and capabilities and their relationship to household structure and reproduction can contribute to societal attempts to address these challenges.

### 2. New data

Recent innovations in large longitudinal surveys have provided researchers with data on new dimensions of individual variation, including psychological traits such as personality and locus of control, economic preference parameters such as risk aversion and time preference, and behavioral tendencies such as trust and reciprocity. It is useful to make a distinction, in terms of the ways they can be used by economists, between these three different categories of new data. Preference parameters such as risk aversion, time preference, and social preferences enter economic models of behavior explicitly, and they can be incorporated into economic analysis in straightforward ways. One example from family economics is provided by recent studies of the effect of risk aversion on age at marriage. In a model of optimal search for a partner, a higher level of risk aversion will tend to reduce optimal reservation partner quality, and so lead to earlier marriage. Spivey (2010) and Schmidt (2008) find that, indeed, the risk-averse do marry early and Light and Ahn (2009) show that risk aversion reduces the probability of divorce.

Behavioral tendencies, such as trust, trustworthiness, and reciprocity, play a more complex role in economics: a tendency to trust others or to reciprocate positive or negative treatment clearly results both from preferences and from beliefs about the behavior or motives of others. Fehr (2008) finds that risk preferences and social preferences predict survey trust and concludes that trust is endogenous, in that it is shaped by experiences and by institutions. Strong family ties, for example, tend to reduce trust in strangers because they reduce individual exposure to people outside the family (Ermisch and Gambetta 2010).

Even more challenging to incorporate into an economic model of constrained choice are personality traits, such as extraversion and conscientiousness, and other standard psychosocial constructs. Do personality traits reflect preferences, constraints, or both? Personality and locus of control are often included in bundles of traits labeled “non-cognitive skills”, a term that implies they are a form of human capital. 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 assert that personality traits, as well as cognitive ability, may impose constraints on individual choices. They conclude that “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. Much more work is needed to conceptually situate personality traits within economics.

Another factor that distinguishes psychological traits from measures such as risk aversion or trust is that the survey-based personality inventories cannot be validated by experimental evidence—they are not linked to choices in the explicit way that risk aversion is predictive of lottery choices, or a reported willingness to trust others is associated with behavior in a trust game. The link to quantitative empirical verification that is possible with preference parameters and behavioral tendencies is attractive to economists, and is not available with personality. We might expect an extraverted individual to be more likely than an introvert to choose an activity involving social interaction over a solitary one, and the conscientious to be more likely to finish an assigned task than the less conscientious, but the behavioral predictions are imprecise.

Given these shortcomings, what do large-sample measures of individual psychological traits offer economists? They do provide measures of individual differences that have been extensively tested and replicated by psychologists, and that have been shown to have strong associations with behavior and with economic and social outcomes. Personality inventories, in particular, are intended to be descriptive of stable differences in individual dispositions that affect how they interact with others and respond to situations. According to Borghans et al. (2008), personality represents “stable patterns of thought, feelings, and behavior.”<sup>1</sup>

There are many alternative personality taxonomies, but the Big Five are broadly accepted as a consistent and reliable categorization of individual temperament. The standard 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.

Each of these personality traits incorporates a set of more specific facets, though short forms of the personality inventories such as those included on large surveys are not able to distinguish these facets reliably. Costa and McCrae (1992) define six such facets for each personality trait: their descriptors for those defining extraversion are sociable, forceful, energetic, adventurous, enthusiastic and outgoing. There is a long history, as with most psychological measures, of testing for internal validity. External validity assessments are becoming more common, but are still limited and tend to be focused on small samples. Recent reviews, 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 (Roberts et al. 2007, Ozer and Benet-Martinez 2006).

1. As we shall see, however, the stability of these measures has been contested.

The importance of personality in the development and maintenance of human relationships has led some psychologists to interpret these traits in an evolutionary context. McAdam and Pals (2006) suggest that the five-factor model may identify individual variations on behavioral dimensions that are significant to human social acceptance and status in groups, and they identify these facets 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 will also be relevant to mating and successful pair-bonding—a conscientious mate should be more trustworthy and more likely to fulfill a marital commitment.

An extensive review of the current state of knowledge on family variation and family change (Morgan et al. 2008) concludes that, although we know a great deal about the correlates of family behavior, we know much less about the mechanisms that link these factors to outcomes—for example, how relationship homogamy or family structure in childhood affect divorce risk. Understanding how personality traits are related to union formation and dissolution, fertility and childrearing can potentially yield new insights into the sources of marital surplus, the causes of divorce, and the returns to children.

Personality inventories and other psychosocial and preference indicators have been added to several large longitudinal surveys in recent years. The German Socio-Economic Panel Study (SOEP) has been a leader in the development and implementation of these new instruments, and has pursued a strategy of theory-based data collection (Wagner et al. 2007). In the past decade, new measures of health status, personal traits and social capital have been introduced into the survey, which began in 1984. In 2003, survey-based measures of particular interest to economists and sociologists—trust, trustworthiness, and fairness—were introduced, and in 2004, indicators of risk aversion. In 2005, a short-scale version of the Big 5 Personality Inventory was administered to persons 16 and over, as well as measures of positive and negative reciprocity. Subsequently, re-tests of most of these measures have been fielded, with a re-test of personality appearing in the newly-released 2009 wave.

Other nationally-representative surveys that include a personality inventory and other psychological and preference indicators include the British Household Panel Survey (BHPS) (which has been replaced, with a doubling of its sample size, by Understanding Society) and the Household, Income, and Labour Dynamics in Australia (HILDA) Survey (Lucas and Donnellan 2009, Cobb-Clark and Tan 2010). The Mexican Family Life Survey broke new ground in 2002 by supplementing survey-based measures of preference parameters such as altruism, time preference, and risk aversion with a pilot that administered a set of incentivized tasks intended to measure the same preferences to a subsample (Eckel et al. 2006). SOEP researchers have also conducted validation exercises on trust and risk aversion (Dohmen et al. 2005, Fehr et al. 2003).

### 3. Economics and Personality

The incorporation of personality and other psychological constructs into economics has already begun, though almost all of the existing work examines their impact on earnings and employment. Economists have long 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.”<sup>2</sup> Bowles and Gintis (1976), in their classic study of the American education system, assert that “employer-valued attributes” were one of the important products of schooling. Heckman and a number of collaborators have worked to incorporate “non-cognitive skills,” including psycho-social traits such as locus of control, into the economic analysis of individual achievement, and have shown that these factors are important determinants of labor market success. A set of recent studies, most of them using a 15-question short-form version of a standard personality inventory that has been included in SOEP and BHPS, have found that personality traits have significant impacts on earnings and occupational choice in Germany and the U.K.

Personality traits can affect earnings through three separate mechanisms. One, personality may affect a worker’s productivity in ways that may be occupation-specific. Extraversion has been found to increase performance in sales jobs (Stewart 1996), while openness to experience should be more advantageous in creative work, and conscientiousness in jobs that require consistency and concentration. Two, in labor markets characterized by imperfect information or by monopoly power, personality may influence labor market processes that drive wages. For example, extraverts may bargain with employers or utilize job networks more effectively (Mueller and Plug 2006). Finally, taste-based discrimination by employers or co-workers may reduce the wages of those who are unpleasant to work with, such as the emotionally-unstable (Nandi and Nicoletti 2009).

In a large sample of men and women who graduated from Wisconsin high schools in 1957, antagonism (low agreeableness) and emotional stability (low neuroticism) increase men’s earnings, while conscientiousness and openness increase women’s (Mueller and Plug 2006). 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 identical, both experience a wage penalty for an external locus of control. For workers in the U.K., there are wage penalties for neuroticism and agreeableness for both male and female workers (Heineck 2007). Emotional stability is also positively related to the wages of men and women in the Netherlands, while agreeableness is associated with lower wages only for women (Nyhus and Pons 2005). The returns to personality factors tend to vary both by tenure and by educational group, confirming that different personality traits enhance productivity in different occupations. It is notable that studies using older data in which gender-based occupational segregation was more pronounced tend to find distinct patterns in the personality determinants of men’s and women’s earnings, while in more recent data the personality effects are very similar.

2. 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.

Personality traits also influence the sorting of workers across occupations, and this is usually interpreted as the result of varying preferences over job attributes (Filer 1986, Krueger and Schkade 2008). Not only do personality profiles differ across occupations, but worker/job matching (or mismatching) appears to affect reported life satisfaction (Winkelmann and Winkelmann 2008). Nandi and Nicoletti (2009) decompose the pay gaps between personality groups in the BHPS data into components that can be explained by personality-based differences in occupation, education, work experience and unexplained components. They find that the observed pay premium for openness can be explained by higher education and sorting into higher-paid occupations, but that the pay premium for extraversion and the penalties for neuroticism and agreeableness cannot be explained by observed qualifications or by occupational sorting.

In contrast, the effects of personality on demographic outcomes in large samples are 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 a higher probability of having children for both men and women. Tavares (2008) 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.<sup>3</sup> She interprets these relationships between personality and fertility timing as reflective of individual women's underlying preferences and motivations for childbearing. However, given that agreeableness and neuroticism are associated with lower pay, personality may also influence the opportunity cost of early childbearing.

One issue that arises in studies of 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),<sup>4</sup> temporal correlations in longitudinal studies commonly exceed 0.9 (Costa and McCrae 1994). This stability may be to some extent endogenous: individuals select environments that are compatible with their dispositions through their choices of partners and of occupation, and therefore maintain considerable personality stability over a lifetime (Caspi and Herbener 1990, Caspi and Roberts 2001). According to Caprara and Cervone (2000, p. 146) “the relative stability of adults' self-reports is one of the

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.

most robust findings in the personality psychology literature”.<sup>5</sup> To date, evidence that adult personality is malleable, or responds to lifecycle events, is limited.

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.

#### **4. Personality and Marital Surplus**

In Lundberg (2010), I present a pair of neoclassical models of marriage that incorporate personality traits as determinants of marital surplus. 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.<sup>6</sup> 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 on the basis of market wages and household productivity (Becker 1981), so that individuals with complementary skills form joint households. 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 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 compared to differences in relative skills.

Individual variation in both preferences and capabilities relevant to marriage can be reflected in measured psychological characteristics. The two types of economic interaction that create marital surplus—household production and joint consumption—carry opposing implications for the effect of these traits on the decision to marry. To see why, consider a pair of simple models:

5. However, Jokela et al. (2009) 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.

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

*MODEL 1: 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:

$$U_i(Q, x_i) = A(Q)x_i + \beta_i Q$$

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 to 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  $MRS_1 + MRS_2 = p$  and the pooled household budget constraint  $x_1 + x_2 + pQ = Y_1 + Y_2$ , where  $Y_i$  is the exogenous income of individual  $i$ . 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 individual preferences for the household public good:  $\beta_1$  and  $\beta_2$ .

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  $A(\mathbf{0}) = \mathbf{1}$ , 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  $\beta_1$  and  $\beta_2$ , the relative preferences for the marriage-exclusive public good.

Suppose that the preference for the marriage-exclusive public good is a function of a personality trait  $z_0$  and that  $\beta_i(z_{0i})$  is increasing in  $z_{0i}$ . 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.<sup>7</sup> Therefore, individuals with greater preferences for marital public goods (such as children, companionship, or conformity with social conventions) are more

7. With assortative matching, the marginal effect of  $z_0$  on the probability of marriage will be even stronger.

likely to marry like-minded individuals rather than remain single. If consumption complementarities are the principal source of gains to marriage, then under the model we have just described, there is no reason to expect differences in the patterns of selection into marriage by personality for men and for women.

*Model 2: Marital Production.* In contrast to the consumption complementarities model, production complementarities in the household 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,  $t = \alpha_1 t_1 + \alpha_2 t_2$ , and purchased goods,  $G$ , so that  $Q = F(t, G)$ . Individual time endowments are allocated to either household production time or market work, 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 to time and budget constraints. 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 each devote their time exclusively to the home and or to the market.

Suppose that market productivity  $w$  is enhanced by a personality trait,  $z_a$  — conscientiousness, for example—and home productivity  $\alpha$  is increasing in a different trait,  $z_b$ . In a labor market with a substantial gender gap in wage schedules such that  $w_2(\bar{z}_a) > w_1(\bar{z}_a)$  (where person 1 in each household is female and person 2 is male), women will tend to specialize in household activities and men in market activities unless their relative endowments of productivity-enhancing traits are strongly skewed towards the other sector. Marital surplus will clearly be increasing in  $z_b$ , since it increases the productivity of time spent in household 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 household productivity (and thus their endowment of  $z_b$ ) will not influence their selection into marriage. With random marital matching and household specialization, 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 further the marginal effect of each trait on marital surplus, and accentuate the dependence of marriage probabilities on distinct male and female traits. Production complementarities and consumption complementarities therefore imply very different patterns of selection into marriage for men and women, as long as specialization in household production tends to be gender-based.

Personality traits may also affect the probability of divorce. In the standard economic model of divorce, a couple who expected the value of their marriage to be positive finds that it is not, either because of a shock (to earnings, health, or child quality) or because of learning about a partner's true nature over time.<sup>8</sup>

8. 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.

That is, a couple divorces when they have “less favorable outcomes from their marriage than they expected when marrying” (Becker, Landes and Michael 1977). Since a shock is less likely to drive marital surplus to zero if the surplus was large to begin with, this suggests that personality characteristics found to be positively associated with marriage will also be negatively associated with divorce.

The two models of marital surplus generate a clear-cut empirical question: Do the same personality traits explain the propensity to marry and divorce for men and for women? If so, then marriage is predominately consumption-based. If different personality traits are associated with marriage and divorce for men and women, then this is evidence that production specialization within marriage is an important source of marital surplus. A sample of household heads and their spouses and partners in the 2005 wave of the German SOEP was used to examine this question (Lundberg 2010).<sup>9</sup> Measures of life-cycle outcomes were constructed for age-appropriate samples, including a dummy variable for ever-married or cohabiting by age 35 and, conditional on a first marriage or cohabitation, the time till divorce or separation. The effects of age-normed personality traits on these outcomes were estimated with Probit and Cox proportional hazards models and a limited number of controls (education, German ethnicity, birth cohort, dummy for reported some religion, East German sample, and (for the divorce hazard) age at marriage).

Except for openness to experience, which significantly reduced the probability of marriage for both genders, the impact of personality traits on marriage were quite different for men and women. A clearer picture emerges if we divide the sample into two cohorts—an older cohort born between 1946 and 1959, and a younger cohort born between 1960 and 1970. For the older cohorts, the statistically-significant determinants of marriage for men and women are quite distinct. Extraversion increases the probability of marriage for both men and women, but conscientiousness only increases marriage for men, and agreeableness and neuroticism only increase marriage for women. The gender differences in these coefficients are all significant and, in fact, agreeableness has the opposite sign in the men’s marriage probability equation—more antagonistic men are more likely to marry. For the younger cohorts, on the other hand, there are no significant differences between the determinants of marriage for men and women—conscientiousness increases, and openness to experiences decreases, marriage for both men and women.<sup>10</sup>

These results strongly suggest that the determinants of marital surplus have changed over the past few decades, and that consumption complementarities have become a more important source of gains for German couples. In the older cohorts, nurturing, sociable, emotional women are more likely to marry, as are antagonistic men. These gender differences in the patterns of sorting into marriage indicate that there is some gender specialization in the attributes that contribute to marital gains, and this is consistent with a marriage based on production complementarities. In the younger cohorts, in contrast, a willingness to comply with conventional norms and a low demand for variety and change increase the value of marital

9. The subsample of guestworkers was omitted from this analysis.

10. The personality effects are very robust and affected very little by the inclusion or exclusion of other control variables or of other psychological and preference variables such as locus of control, risk aversion, and reciprocity.

public goods, and the effect of personality traits on sorting into marriage are not significantly different for men and women. This is the pattern we would expect if marital surplus is produced by consumption complementarities. These observed changes in the relationship between personality and marriage propensities across cohorts allow us to infer a great deal about the changing nature of marriage in Germany after WWII.

Openness to experience also has significant and substantial effects on the probability of divorce or separation from a first union for both men and women. In a Cox proportional hazards model, a one standard deviation increase in openness increases the divorce hazard by 12 percent for women and by 15 percent for men. Low conscientiousness and high extraversion also increase the probability of union dissolution for men and, for the older cohort only, low agreeableness and neuroticism increase divorce for women.<sup>11</sup> Some of the determinants of divorce are the same (in reverse) of those that promote marriage. This is consistent with the hypothesis that low surplus makes marriage more vulnerable to shocks and surprises, and increases the propensity to divorce. The consistent positive effect of openness to experience follows this pattern, as does the effect of male conscientiousness and female agreeableness in the older cohort. It is notable that people who are open to experience (i.e. who are intellectual, adventurous, and who like change and variety) are particularly prone to divorce. This suggests that boredom, rather than shocks and surprises, plays an important role in relationship dissolution for some couples.

The impact of two personality traits does not conform to the marital surplus model: male extraversion and female neuroticism are positively related to both marriage and divorce for the older cohort of the SOEP sample. The effect of extraversion can be rationalized with a search model, in which the arrival rate of alternative matches can increase the rate of relationship transitions—both into a first marriage and out of that marriage into a second relationship—and sociability increases this arrival rate. The role of neuroticism, a trait which includes the sub-traits of anxiety, irritability, impulsiveness, and vulnerability and which increases the propensity of women to both marry and divorce, is not so clear-cut in a rational choice model. In an extended empirical specification (Lundberg 2010), low levels of positive reciprocity are positively associated with divorce, but only for women.

One possible explanation for these results is that emotional instability leads to negative affect and inflexibility in marital negotiations and that these, as marriage researchers such as Gottman (1994) emphasize, lead to divorce or separation. In more conventional economic terms, neuroticism may be associated with asymmetric information or with high transactions costs to marital bargaining. In Peters' (1986) model of divorce, asymmetric information leads to inefficient divorces because couples are unable to renegotiate a division of marital resources following a shock that leaves total surplus positive. In the separate spheres bargaining model (Lundberg and Pollak 1993) transactions costs associated with cooperative bargaining can leave a couple at an inefficient (low-surplus) non-cooperative equilibrium. The empirical role of neuroticism and low reciprocity

11. Openness also has a significant positive effect on divorce for women only in the younger cohort who are, on average, only 40 years old in 2005. In the extended model, however, low risk aversion and positive reciprocity and an external locus of control increase divorce for women, but not for men.

in predicting divorce suggests that, though neoclassical choice models provide a useful theoretical foundation for interpreting the effects of personality on marriage, we may wish to supplement it by considering some behavioral issues in family decisions.

### 5. Behavioral Approaches to Family Behavior

Behavioral economics has had a profound impact on many areas of economic analysis, highlighting the effect of limited cognition and self-control on individual behavior, and in particular, on decisions involving time, or risk and uncertainty (Camerer and Loewenstein 2004). If these factors affect savings and work effort, they are surely also relevant to decisions that involve complex, long-term family arrangements, such as marriage and child-bearing. It is also clear that emotions play an important role in choices involving sex, love, and fidelity, so that the “visceral” factors that can lead to impulsive and destructive behavior (Loewenstein 2000) on highways and in boardrooms are at work in the family as well. One challenge in developing a formal behavioral approach to the family is that a baseline “rational” set of strategies that we can use to test for deviations from rationality are difficult to come by.

A clear cognitive bias exists in individual expectations about divorce. Newly-married couples do not expect to divorce, and this excessive optimism about the future quality of a marriage predates the divorce boom of the 1970s. In their book *Nudge*, Thaler and Sunstein note the almost universal failure to correctly judge the likelihood of divorce, but limit their recommendations for “nudging” couples toward more optimal choices to the establishment of clear default guidelines for property division and child custody upon marital dissolution. Certainly this measure will improve decisions as an already married couple begins to update their expectations of future marital surplus and anticipate separation—which is perhaps all that can be expected here. Loewenstein (2000) notes that the failure of couples to negotiate prenuptial agreements or other divorce-contingent arrangements is also related to the general tendency of people to underestimate, when in a “cold” state, the influence that emotions will have on future actions—and thus, to fail to anticipate the destructiveness of divorce conflict.

Marriage itself may have important effects on behavior for individuals with limited self control. Akerlof (1998) reviews the extensive evidence that marriage alters men’s behavior—dramatically decreasing criminal behavior and substance abuse and increasing work effort—and argues that these changes occur because marriage changes men’s preferences. An alternative explanation is that marriage acts as a deterrent device by imposing additional costs of impulsive and risky behavior through spousal monitoring and punishment, and that men with time-inconsistent preferences are willing to pay the costs of marriage to have their options reduced and their behavior and future prospects improved. Other economists have noted that legal marriage, with its exit costs, serves as a commitment device that promotes family-specific investments (Matouschek and Rasul 2008, Stevenson 2007).

Can personality traits predict departures from rational, forward-looking behavior in family domains? There is considerable evidence that some personality traits are predictive of short-sighted and impulsive behavior in other areas. Low conscientiousness and high neuroticism are strongly related to mortality. Some part of this impact occurs via personality effects on health behaviors that suggest

immoderation and impulsivity play an important role, such as smoking and the use of drugs and alcohol.<sup>12</sup> Savings behavior is also affected by these personality traits: Duckworth and Weir (2010) find that low conscientiousness and neuroticism reduce retirement wealth, conditional on lifetime earnings and cognitive ability. Since the same personality traits are also related to divorce in the SOEP sample, this may indicate that some marital dissolutions among the older cohort are associated with limited self-control. Cognitive skills may also play a role in promoting more rational family behaviors, as they predict rational financial planning and savings decisions. Measures of cognitive ability are negatively related to divorce in the American National Longitudinal Survey of Youth 1979 (Blazys 2009). Future research should address the role of cognitive skills as well as personality and other psychosocial traits, in explaining the increasing divergence of family structure across socio-economic groups as the barriers to divorce and extramarital childbearing fall.

## **6. Conclusion**

A substantial increase in the availability of data on psychosocial traits in large representative longitudinal samples has opened up new areas of research for economists and new opportunities for collaborations with psychologists. As an example, I incorporate personality into alternative economic models of marriage, with individual traits associated with either productivity in home or market sectors, or preferences for household public goods. Empirically, personality traits have robust effects on individual propensities to marry and to divorce in a representative sample of the German population. Changes in these patterns across cohorts are consistent with a shift in the principal sources of marital surplus from production complementarities to consumption complementarities in the past few decades. Some personality traits related to divorce are also related to limited self-control in other domains, and suggest that departures from rational action should be considered in models of family behavior. In general, further analysis of the impact of personality and other psychological indicators on family relationships may improve our understanding of variation in partnership and parental decision-making, and of their responses to policy and to institutional environments.

## **References**

- Akerlof, G. (1998), Men Without Children, *Economic Journal* 108, 287–309.  
Becker, G.S. (1981), *A Treatise on the Family*. Harvard University Press, Cambridge.  
Becker, G.S., E.M. Landes and R.T. Michael (1977), An Economic Analysis of Marital Instability, *Journal of Political Economy* 85, 1141–1187.  
Bergstrom, T.C. and R.C. Cornes (1983), Independence of Allocative Efficiency from Distribution in the Theory of Public Goods, *Econometrica* 51, 1753–1765.  
Blazys, G. (2009), Personality, Intelligence, and Marital Outcomes, Working Paper, University of Washington.  
Borghans, L., A.L. Duckworth, J.J. Heckman and B. Weel (2008), The Economics and Psychology of Personality Traits, *Journal of Human Resources* 43, 972–1059.

12. See the review in Roberts et al. (2007).

- Bowles, S. and H. Gintis (1976), *Schooling in Capitalist America: Educational Reform and the Contradictions of Economic Life*. Basic Books, New York.
- Camerer, C.F. and G. Loewenstein (2004), Behavioral Economics: Past, Present, Future, in: C.F. Camerer, G. Loewenstein and M. Rabin (eds.), *Advances in Behavioral Economics*. Russell Sage, New York, 3–51.
- Caprara, G.V. and D. Cervone (2000), *Personality: Determinants, Dynamics, and Potentials*. Cambridge University Press, New York.
- Caspi, A. and E.S. Herbener (1990), Continuity and Change: Assortative Marriage and the Consistency of Personality in Adulthood, *Journal of Personality and Social Psychology* 58, 250–258.
- Caspi, A. and B.W. Roberts (2001), Personality Development Across the Life Course: The Argument for Change and Continuity, *Psychological Inquiry* 12, 49–66.
- Charles, K.K. and M. Stephens Jr. (2004), Job Displacement, Disability, and Divorce, *Journal of Labor Economics* 22, 489–522.
- Cobb-Clark, D.A. and M. Tan (2010), Noncognitive Skills, Occupational Attainment, and Relative Wages, forthcoming in: *Labour Economics*.
- Costa, P.T. and R.R. McCrae (1992), *NEO PI-R Professional Manual*. Psychological Assessment Resources, Odessa, FL.
- Costa, P.T. and R.R. McCrae (1994), Longitudinal Stability of Adult Personality, in: R. Hogan, J. Johnson and S. Briggs (eds.), *Handbook of Personality Psychology*. Academic Press, San Diego, 269–290.
- Dohmen, T., A. Falk, D. Huffman, U. Sunde, J. Schupp, and G.G. Wagner (2005), Individual Risk Attitudes: New Evidence from a Large, Representative, Experimentally-Validated Survey, forthcoming in: *Journal of the European Economic Association*.
- Duckworth, A. and D. Weir (2010), Personality, Lifetime Earnings, and Retirement Wealth, Michigan Retirement Research Center Paper No. 2010–2235.
- Duncan, G.J. and R. Dunifon (1998), Soft-Skills and Long-Run Labor Market Success, in: S.W. Polachek and J. Robst (eds.), *Research in Labor Economics* 17, 123–150. London: JAI Press.
- Eckel C., J. Hotz, C. Martinelli, S. Parker, L. Rubalcava, G. Teruel and D. Thomas (2006), Measures of Risk and Time Preferences and Socioeconomic Status, California Center for Population Research.
- Ermisch, J. and D. Gambetta (2010), Do Strong Family Ties Inhibit Trust?, forthcoming in: *Journal of Economic Behavior and Organization*.
- Fehr, E. (2008), On the Economics and Biology of Trust, IZA Discussion Paper No. 3895, Bonn.
- Fehr, E., U. Fischbacher, B. von Rosenbladt, J. Schupp, and G.G. Wagner (2003), A Nation-Wide Laboratory: Examining Trust and Trustworthiness by Integrating Behavioral Experiments into Representative Surveys, IZA Discussion Paper No. 715, Bonn.
- Filer, R. K. (1986), The Role of Personality and Tastes in Determining Occupational Structure, *Industrial and Labor Relations Review* 39, 412–424.
- Gottman, J.M. (1994), *What Predicts Divorce The Relationship between Marital Processes and Marital Outcomes*. Lawrence Erlbaum Associates, Hillsdale, N.J.
- Heckman, J.J., J. Stixrud, and S. Urzua (2006), The Effects of Cognitive and Non-cognitive Abilities on Labor Market, *Journal of Labor Economics* 24, 411–482.
- Heineck, Guido (2007), Does it Pay to be Nice? Personality and Earnings in the U.K., LASER Discussion Paper No. 3.
- Heineck, G. and S. Anger (2008), The Returns to Cognitive Abilities and Personality Traits in Germany, *Labour Economics* 17, 535–546.
- Hogan, R. and J. Hogan (2007), *Hogan Personality Inventory Manual*. Hogan Assessment Systems, Tulsa, OK 1992, Third Edition 2007.
- Jokela, M., M. Kivimäki, M. Elovainio and L. Keltikangas-Järvinen (2009), Personality and Having Children: A Two-Way Relationship, *Journal of Personality and Social Psychology* 96, 128–230.

- Krueger, A.B. and D. Schkade (2008), Sorting in the Labor Market Do Gregarious Workers Flock to Interactive Jobs?, *The Journal of Human Resources* 43, 860–883.
- Kuhn, P. and C. Weinberger (2005), Leadership Skills and Wages, *Journal of Labor Economics* 23, 395–436.
- Lam, D. (1988), Marriage Markets and Assortative Mating with Household Public Goods: Theoretical Results and Empirical Implications, *Journal of Human Resources* 23, 462–487.
- Lazear, E. (2000), Economic Imperialism, *Quarterly Journal of Economics* 115, 99–146.
- Light, A. and T. Ahn (2009), Divorce as Risky Behavior, forthcoming in: *Demography*.
- Loewenstein, G. (2000), Emotions in Economic Theory and Economic Behavior, *American Economic Review Papers and Proceedings* 90 (2), 4276–4432.
- Lucas, R.E. and M.B. Donnellan (2009), Age Differences in Personality: Evidence From a Nationally Representative Australian Sample, *Developmental Psychology* 45, 1353–1363.
- Lundberg, S. (2010), Personality and Marital Surplus, SOEppapers No. 307, Berlin.
- Lundberg, S. and R.A. Pollak (1993), Separate Spheres Bargaining and the Marriage Market, *Journal of Political Economy* 101, 988–1010.
- Lundberg, S. and R.A. Pollak (2003), Efficiency in Marriage, *Review of Economics of the Household* 1, 153–167.
- Magnus, K., E. Diener, F. Fujita, and W. Pavot (1993), Extraversion and Neuroticism as Predictors of Objective Life Events: A Longitudinal Analysis, *Journal of Personality and Social Psychology* 65, 1046–1053.
- Matouschek, N. and I. Rasul (2008), The Economics of the Marriage Contract: Theories and Evidence, *Journal of Law and Economics* 51, 59–110.
- McAdams, D.P. and J.L. Pals (2006) A New Big Five: Fundamental Principles for an Integrative Science of Personality, *American Psychologist* 61, 204–217.
- Morgan, S.P., C. Bledsoe, S.M. Bianchi, P.L. Chase-Lansdale, T.A. DiPrete, V.J. Hotz, S.Sanders, J.A. Seltzer and D. Thomas (2008), *Designing New Models for Explaining Family Change and Variation*, <http://www.soc.duke.edu/~efc/Docs/pubs/EFC%20FINAL%20AUG%2018%20complete%20w%20appendice.pdf>
- Mueller, G. and E. Plug (2006), Estimating the Effect of Personality on Male and Female Earnings, *Industrial and Labor Relations Review* 60, 3–22.
- Nandi, A. and C. Nicoletti (2009), Explaining Personality Pay Gaps in the U.K., ISER Working Paper 2009–22.
- Nyhus, E.K. and E. Pons (2005), The Effects of Personality on Earnings, *Journal of Economic Psychology* 26, 363–384.
- Ozer, D.J. and V. Benet-Martinez (2006), Personality and the Prediction of Consequential Outcomes, *Annual Review of Psychology* 57, 401–421.
- Peters, H.E. (1986), Marriage and Divorce: Informational Constraints and Private Contracting, *American Economic Review* 76, 437–454.
- Plotnick, R. (1992), The Effects of Attitudes on Teenage Premarital Pregnancy and its Resolution, *American Sociological Review* 57, 800–811.
- 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, 3–25.
- Roberts, B.W., N.R. Kuncel, R. Shiner, A. Caspi, and L. 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, 313–345.
- Schmidt, L. (2008), Risk Preferences and the Timing of Marriage and Childbearing, *Demography* 45, 439–460.
- Spivey, C. (2010), Desperation or Desire? The Role of Risk-Aversion in Marriage, *Economic Inquiry* 48, 499–516.
- Stevenson, B. (2007), The Impact of Divorce Laws on Investment in Marriage Specific Capital, *Journal of Labor Economics* 25, 75–94.

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- Stevenson, B. and J. Wolfers (2007), Marriage and Divorce: Changes and their Driving Forces, *Journal of Economic Perspectives* 21 (2), 27–52.
- Stewart, G.L. (1996), Reward Structure as a Moderator of the Relationship between Extraversion and Sales Performance, *Journal of Applied Psychology* 81, 619–627.
- Tavares, L. (2008), Who Delays Childbearing? The Relationship between Fertility, Education and Personality Traits. Dondena Working Paper No. 9, September 2008 (revised January 2010).
- Thaler, R.H. and C.R. Sunstein (2008), *Nudge: Improving Decisions About Health, Wealth, and Happiness*. Yale University Press, New Haven, N.J.
- Wagner, G.G., J.R. Frick, and J. Schupp (2007), The German Socio-Economic Panel Study (SOEP) – Scope, Evolution and Enhancements, *Schmollers Jahrbuch* 127, 139–169.
- Weiss, A. (1988), High School Graduation, Performance, and Wages, *Journal of Political Economy* 96, 785–820.
- Weiss, Y. and R. Willis (1997), Match Quality, New Information, and Marital Dissolution, *Journal of Labor Economics* 15, S293–S329.
- Winkelmann, L. and R. Winkelmann (2008), Personality, Work, and Satisfaction: Evidence from the German Socio-Economic Panel, *The Journal of Positive Psychology* 3, 266–275.

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