

For: Conference Volume on “*The Paradoxes of Happiness in Economics*”
Conference held at the University of Milano-Bicocca, March 21-23, 2003

Testing Theories of Happiness

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Final version, November 10, 2003

Abstract: Happiness research in economics takes reported subjective well-being as a proxy measure for utility and has already provided many interesting insights about human well-being and its determinants. We argue that future research on happiness in economics has a lot of potential, but that it needs to be guided more by theory. We propose two ways to test theories of happiness, and illustrate them with two applications. First, reported subjective well-being can contribute towards a new understanding of utility in economics. Here, we study the introduction of income aspirations in individuals’ utility functions in order to improve our understanding of how income affects individual well-being. Second, happiness data offers a new possibility of discriminating between different models of behavior. This is studied for theories of marriage, which crucially depend on auxiliary assumptions as to what contributes to well-being in marriage. Both applications are empirically tested with panel data for Germany.

JEL classification: D13, D60, D63, I31, J12

Keywords: aspiration level, marriage, relative income, subjective well-being, utility

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1 Introduction

Happiness research in economics takes reported subjective well-being as a proxy measure for utility. This allows for the testing of ‘old hypotheses’ in a new way. Present research deals, for example, with the relationship between happiness and income, unemployment, inflation, inequality and democratic institutions. This research has put forward many interesting findings. However, future research on subjective well-being has to be further developed in order to provide additional valuable insights. We envisage two main directions for promising research.

First, happiness research offers new ways for testing the basic assumptions of the economic approach and for approaching a new understanding of utility in economics. Based on data on reported subjective well-being, it is possible to address fundamental questions like, for example, ‘Do people consciously maximize their utility?’ or ‘Can people successfully predict their future utility/preferences?’ These questions are closely related to the research program of scientists in behavioral economics.

Second, happiness research provides a new possibility for discriminating between models that predict the same patterns in behavior but predict differences in experienced utility. This complementary evidence thus helps to reject particular models and their policy recommendations. Models may come from areas as different as the micro-foundation of macroeconomics (e.g. on voluntary versus involuntary unemployment) and addiction (rational addiction versus limited self-control).

We present our own application to both directions. In an initial study, we analyze the role of income aspirations in the notion of relative utility. We present new evidence for the effect of income aspirations on people’s satisfaction with life in longitudinal data for Germany. A second application takes advantage of data on subjective well-being to test Becker’s model of household production and the division of labor in marriage compared to sociological theories of marriage.

The remainder of the paper is structured as follows: In the next section, we briefly describe the current state of happiness research in economics. In section 3, we outline two directions for future research. Both directions are illustrated with examples and extended applications in section 4. Section 5 offers some concluding remarks.

2 The Current State of Happiness Research in Economics

Research on happiness has been one of the most stimulating new developments in economics in recent years. It attracts economists of all ages and some findings have already found the attention of a broader audience in government administrations, as well as in the public. Happiness research provides the tools and measures to test ‘old hypotheses’ in a new way. The result is a substantial amount of new and insightful complementary evidence. We do not want to summarize these findings here (for overviews see Easterlin 2002, Frey and Stutzer 2002a,b, Oswald 1997). However, we sketch them briefly in order to show the contrast to what we expect to be successful research in the future.

In a nut shell, current research is guided by the question: how does x affect happiness? X can be any factor supposed to affect human happiness, examples being income, inflation, or unemployment. We plot trends, measure simple correlations and estimate microeconomic happiness functions. Sometimes our work is more data and measurement driven than based on theory. Some of our findings come from explorative analyses and ex post rationalizations of their results.²

We neither want to devalue the research efforts in this direction nor the empirical findings that – in our view – are quite remarkable. However, we think that research on happiness can make an even bigger impact on modern economics.

3 Future Research on Subjective Well-Being

Empirical research on happiness in economics has a short history. The marginal benefits of the study of subjective well-being are still very high in almost every direction questions have been addressed so far.

Further analyses of survey data on subjective well-being will be worthwhile, e.g., (i) to study the relationship between discrimination of women on the labor market and their life satisfaction (e.g. Clark 1997), (ii) to understand the interdependencies in well-being at the family level (Winkelmann 2002), (iii) to test how various indicators of the quality of life, like crime, environmental quality or commuting are related to individual well-being (e.g. Michalos and

² This criticism also applies to our own efforts to study the effect of political institutions on reported subjective well-being (Frey and Stutzer 2000).

Zumbo 2000) or (iv) to analyze whether social capital has positive external effects on people's well-being (e.g. Helliwell 2003). Special efforts will be made to establish causality.

Promising future research can also be expected for the question on how happiness affects individual behavior (for a theoretical investigation, see e.g., Hermalin and Isen 1999). People's level of subjective well-being may influence many important economic decisions, like consumption activities, work behavior, risk taking in investment or even political engagement and voting behavior.

The future will, of course, bring improvements in the methods that are applied to research on happiness and economics (see e.g. the interesting contribution by van Praag in this volume). However, this progress sometimes tends to stifle innovation and the relevance of research questions.

There is much room, on the other hand, for improvements in the quality and the understanding of happiness measures. In this area, scientists around Daniel Kahneman are currently coming up with valuable new insights (see the article by Kahneman in this volume). One question is whether people's instantaneous level of happiness can be captured by self-reported measures of well-being or whether there is a difference between people's hedonic experiences and their explicit reflective appraisals of experiences in reported subjective well-being (e.g. Schooler et al. 2003). People are sometimes fully engaged in challenging activities and thereby experience great pleasure (or flow). Because of the very nature of this situation, people will never assess and report their well-being when in such a state and thus set boundaries for the measurement of instant utility. New insights will be provided when we know more about correlations between reported subjective well-being and physiological measures of well-being. Correlations over time and across people would be interesting, whereby people with different frames of reference could be studied. Time-series for physiological measures would be particularly interesting in order to assess whether people have changed their reference standards in self-reported happiness over time. Given the possible shortcomings of happiness measures today, one should at the same time keep in mind that the required quality of happiness data depends on its intended use. Moreover, the quality of the happiness data should be compared to alternative concepts of measuring people's level of well-being.

While there will be further progress in many branches of research on happiness and economics, the success of our endeavor will be determined, however, by the extent our findings will be

integrated into established economics. We see two main opportunities as to how research on happiness and economics can contribute to the core of economics in the future. We describe them in the following two sections.

3.1 Towards a Psychologically Sounder Concept of Utility in Economics

Econometric and experimental research methods, together with proxy measures for people's well-being, can inform economics about a utility concept with more psychological content and one that is closer to people's well-being than revealed behavior. There have, of course, been a considerable number of contributions along this line already. In particular, there is the work by Kahneman and co-researchers (1991, 1997, 2000), by the Leyden group around van Praag (1971, 1993, 1999) and by Easterlin (this volume) (for a review see Frey and Stutzer 1999). Research in the direction of a psychologically sounder notion of individual well-being challenges various basic assumptions of the economic approach that are incorporated in utility theory.

Future research could deal with several questions:

- *Do people consciously maximize their utility?* This positive question is usually not asked, because it is taken for granted or even seen as a moral obligation in western societies, that the pursuit of happiness is the main source of human motivation. In particular, economics is based on conscious rational choice. However, such an approach has been criticized as being unscientific. When modern economics was under way, psychologists like William James (1890) argued that scientists should take all possible motives into account in their theories. Behavior might not always aim at maximizing utility, but might be impulsive, follow obligations and not be goal-oriented (for an overview on this debate, see Lewin 1996). Whether people explicitly follow the goal of maximizing happiness is thus open for empirical research (see, e.g., Kityama and Markus 2000).
- *Should people try to maximize their utility?* This question is asked because people's attempts at assessing their own level of utility may be self-defeating. Schooler et al. (2003) argue that hedonic introspection may undermine the utility that is attempted to be measured, because it can reduce individuals' sensitivity to their own hedonic experience (p. 8). Consistent with this claim, there are several studies finding that happy people are less introspective (e.g. Lyubomirsky and Lepper 1999). The above question is justified because the explicit pursuit of maximum happiness can actually undermine the ability to achieve it. A neat illustration is

offered by Schooler et al. (2003), who study “the costs of trying to have a good time” on New Years Eve 1999. With an e-mail questionnaire sent out before the big event, they asked 475 people how large a celebration they were planning, how much they expected to enjoy the event, and how much money and time they were expecting to spend on the party. After the event, people were asked the same questions with regard to their actual experiences. They found that those people who expected a great party were more likely to be disappointed than those who only expected a small celebration or no celebration at all. The difference between experienced and expected enjoyment was negatively correlated with people’s anticipation, as well as the time they expected to spend on preparations. The active pursuit of happiness may also be self-defeating, because people have faulty theories about happiness. People who see the source of a good life relatively more in terms of financial success consistently report lower self-esteem, vitality and life satisfaction (see e.g. Kasser and Ryan 1993, Diener and Oishi 2000).

- *Can people successfully predict their future utility?* Economics evidently assumes that this is possible. At least, no systematic deviations are expected for individuals who learn. In contrast, Scitovsky (1976) has criticized this view as ‘unscientific’ because “it seemed to rule out – as a logical impossibility – any conflict between what man chooses to get and what will best satisfy him” (p. 4). Moreover, psychologists have studied people’s success in forecasting utility they are about to experience in many careful experiments and surveys (for a review, see Loewenstein and Schkade 1999). While they find that people accurately predict whether an emotional experience primarily elicits good or bad feelings, people often hold incorrect intuitive theories about the determinants of happiness and, e.g., underestimate the speed of adaptation to new experiences. Due to these misguided predictions, we think that individuals make systematic mistakes in decision-making. When deciding (rather than consuming) extrinsic attributes of choice options are more salient than intrinsic attributes. People underestimate intrinsic attributes and therefore devote too little time to their family, friends or hobbies. They overestimate extrinsic attributes and therefore put too much effort into acquiring income and gaining status, which makes them overall worse off (Frey and Stutzer 2003).
- *Do people have preferences for processes over and above outcomes?* In the assessment of institutions, it is important to understand whether processes themselves are a source of utility.

Recommendations for institutional design may be quite different if people appreciate autonomy, participation or self-determination beyond outcomes. Data on subjective well-being allow direct empirical investigations of these aspects as a source of people's well-being (for an introduction to procedural utility, see Frey, Benz and Stutzer in press).

In section 4.1, we discuss a further path towards a psychologically sounder concept of utility in economics. We discuss, and empirically show, how the idea of relative utility can be better studied using data on subjective well-being.

3.2 Testing Economic Theories and Predictions

With a proxy measure for utility at hand, competing theories can be discriminated that make the same predictions for people's behavior, but differ in what they put forward as people's utility level. This kind of test may become a powerful tool to falsify theories that proved resistant to a multitude of observed behavior. Some examples can serve to illustrate the potential of happiness research for this purpose.

- Systematically different theories exist to explain labor supply and unemployment over the business cycle. In new classical macro-economics, a perfect labor market is assumed, people heavily substitute their labor supply over time due to changes in wages and interest rates and, if they are unemployed, it is voluntary. According to this view, the loss of income due to unemployment is chosen and unemployed people suffer no lower utility level. In contrast, new Keynesian macro-economics diagnoses involuntary unemployment due to price and wage rigidities. Unemployed people would be willing to accept a job at the current wage rate, but cannot find one. If people lose their job, they suffer reduced utility.

Based on unemployed people's behavior, it is very difficult to assess the relative importance of these two models of the labor market. However, individual reports of subjective well-being provide information about the utility level of unemployed people. It can be studied whether unemployed people are better or worse off than people with the same income, but less leisure time. It is one of the most robust findings in research on happiness in economics that unemployed people suffer large non-pecuniary costs from their lot, that are at odds with voluntary unemployment (e.g. Clark and Oswald 1994, Winkelmann and Winkelmann 1998).

- In related research, Stutzer and Lalive (2002) study the effect of the social norm to work on unemployed people's behavior. They find that a stronger social work norm in a community significantly reduces the duration of unemployment of fellow residents that are looking for a job. From this result, it is not possible to assess whether a stronger social work norm is effective as a result of social sanctions, or whether, in a community with a stronger norm, unemployed people get social support and information which enables them to find a job more quickly. However, the two scenarios lead to different predictions for unemployed people's well-being. While they are expected to be relatively better off if they get social support, they are probably suffering even more when a stronger social norm to work primarily means social sanctions. First results for the life satisfaction of unemployed people across Swiss communities are consistent with the latter view.
- Economic models can make systematically different predictions for the effect of excise taxes on people's utility, while they may all predict reduced consumption of the good that is taxed. People suffer a loss when a normal good is taxed and experience increased utility when the tax helps to overcome a bad habit. Depending on what characteristics are assumed for particular forms of consumption like smoking, drinking alcoholic beverages or eating chocolate, people might advocate sin taxes to encourage individuals to improve their lot or oppose them as being discriminatory against particular pleasures in life.

Research on happiness can contribute to this debate and directly study the effect of, say, tobacco taxes on people's subjective well-being. In two longitudinal analyses across the US and Canadian states, Gruber and Mullainathan (2002) perform such a test with data from the General Social Survey. They analyze the effect of changes in state tobacco taxes on the reported happiness of people who are likely to be smokers. They arrive at the astonishing result that a real cigarette tax of 50 cents³ significantly reduces the likelihood of being unhappy among predicted smokers. In fact, predicted smokers would, with 50 cents taxes, be just as likely to report being unhappy as those not predicted to be smokers (i.e. the proportion of smokers in the lowest happiness category would fall by 7.5 percentage points). This result favors models of time-inconsistent smoking behavior, in which people have problems with self-control.

³ The average real (in 1999 US\$) cigarette tax in the United States is 31.6 cents in the sample (Gruber and Mullainathan 2002, p. 14).

- Many theories in regional, urban and public economics assume that arbitrage across markets and across space equate people's utility level, *ceteris paribus*. For example, people only accept more time spent commuting if they are either compensated with a higher salary or if they benefit from cheaper housing. Thus, there is a strong notion of equilibrium underlying economic models of location and federal competition. With data on subjective well-being, the prediction of equalized levels of utility can be tested directly. Stutzer and Frey (2003b) estimate the effect of commuting time on people's satisfaction with life based on 7 waves of the German Socio-Economic Panel. In contrast to the equilibrium prediction, a negative partial correlation between commuting time and life satisfaction is found that is robust to a number of alternative explanations. For economics, this result constitutes a commuting paradox.

The new strategy to test economic theories is exemplified in more detail in section 4.2. Based on data on subjective well-being, we study crucial assumptions that are underlying models of the marriage market and lead to completely different mating patterns in equilibrium.

4 Two Applications

4.1 Relative Utility: The Role of Income Aspirations

The concept of utility in economics is based on a very simple psychological notion. Economics assumes that people always know what is best for them and that they make decisions accordingly. Moreover, it is assumed that people's satisfaction depends on what they have in absolute terms. It is taken as self-evident that higher income and consumption levels provide higher utility.⁴

However, a psychologically sounder concept of utility should take into consideration that human beings are unable and unwilling to make absolute judgements. Rather, they are constantly drawing comparisons from their environment, from the past or from their expectations of the future. Thus, people notice and react to deviations from *aspiration levels*.⁵

⁴ There are, of course, scientists who oppose this notion. Frank (1985a, 1999, this volume), Galbraith (1958), Hirsch (1976), Scitovsky (1976) and, more recently Schor (1998), studying consumer culture – in particular in the United States – emphasize the important role of socially formed aspirations and expectations for consumer satisfaction.

⁵ The importance of relative judgements for happiness is e.g. shown in laboratory experiments (Mellers 2000, Smith et al. 1989 and Tversky and Griffin 1991).

Most economists would not deny that utility is inherently relative in nature. Even founders of traditional economics, like Paul Samuelson, emphasized that utility functions are not constant: “Because man is a social animal, what he regards as ‘necessary comforts of life’ depends on what he sees others consuming” (1973, p. 218 cit. in Holländer 2001). Nevertheless, most economic models of human behavior assume invariant utility functions. Presumably, for reasons of testability of the basic model, changing tastes have been widely neglected.⁶

We argue that income aspirations ought to be introduced in people’s utility function in order to better understand their well-being. An individual’s income aspiration can capture his or her concerns for relative income, as well as his or her adaptation to a previous income level. It is hypothesized that higher income aspirations reduce the utility people gain from a given income or consumption level. In a new and direct way, the effect of income aspirations on people’s utility is empirically tested. We study panel data for Germany that includes individual data on reported satisfaction with life as a proxy measure for utility, as well as an income evaluation measure as a proxy for people’s aspiration levels.⁷

a) What makes for the relativity in people’s utility?

There are two main processes forming individuals’ aspirations, and producing the relativity in people’s utility evaluation.

First, people make *social comparisons*, which drive their positional concerns for income. It is not the absolute level of income that matters most, but rather one’s position relative to other

⁶ Among the few exceptions, the theories of preference change have concentrated on habit formation (e.g. Marshall 1890; Modigliani 1949; Pollack 1970; and more recently Carroll, Overland and Weil 2000). Concepts of interdependent preferences due to comparisons with relevant others (see e.g. Frank 1985b; Pollak 1976; and Clark and Oswald 1998 for a survey) have remained rare. There is another class of interdependent utility models that focuses on fairness concerns rather than positional concerns (e.g. Becker 1974b, Fehr and Gächter 2000). Empirical studies that focus on individuals’ distributive concerns, and which use data on reported subjective well-being, are e.g. Alesina et al. (2001), Hagerty (2000), Schwarze and Härpfer (2002) and Tomes (1986).

⁷ Related research has been conducted by Easterlin (1974, 1995, 2001, this volume), who uses the concept of aspirations as a frame of reference to resolve – as he calls it – the happiness paradox. The happiness paradox describes two striking observations in the relation between income and happiness: While people with higher income report, on average, higher satisfaction with life, raising everybody’s income, on average, does not increase people’s subjective well-being. It is argued that, in the latter case, that individuals’ aspirations grow hand in hand with income.

individuals. This idea of *relative income* is one part of the more general aspiration level theory. Positional concerns are not a new aspect of human nature, but they are probably more pronounced today because of more extended possibilities for social comparison. Many economists in the past have noted that individuals compare themselves to significant others with respect to income, consumption, status or utility. Marx (1849) expressed his view about the social aspect of utility most explicitly: “Our wants and pleasures have their origin in society; we therefore measure them in relation to society; we do not measure them in relation to the objects which serve for their gratification. Since they are of a social nature, they are of a relative nature.” Veblen (1899) coined the notion of ‘conspicuous consumption’, serving to impress other persons. The ‘relative income hypothesis’ has been formulated and econometrically tested by Duesenberry (1949), who posits an asymmetric structure of externalities. People look upward when making comparisons. Aspirations thus tend to be above the level already reached. Wealthier people impose a negative external effect on poorer people, but not *vice versa*. As a result, savings rates depend on the percentile position in the income distribution, and not solely on the income level, as in a traditional savings function.

Second, people adapt to their new income or consumption level. Additional material goods and services initially provide extra pleasure, but it is usually only transitory. Higher utility from material goods wears off. Satisfaction depends on change and disappears with continued consumption. This process, or mechanism, that reduces the hedonic effects of a constant or repeated stimulus, is called *adaptation*.

Processes of hedonic adaptation supplement the socially comparative, or even competitive, processes in consumption. Together, they make people strive for ever higher aspirations.⁸ It is but a short step from aspirations to individual welfare. According to aspiration level theory, individual well-being is determined by the gap between aspiration and achievement (Andrews and Withey 1976, Campbell et al. 1976 and Michalos 1985).

b) How to test the effect of income aspirations on individual utility?

⁸ The concept of aspiration levels is well grounded in psychology and sociology (e.g. Irwin 1944, Lewin et al. 1944 and Stouffer et al. 1949), as is adaptation level theory in psychology (in particular Helson 1964, Brickman and Campbell 1971, Parducci 1995; and, for a modern discussion, Frederick and Loewenstein 1999).

Here we apply a new approach to study the role of income aspirations in individual well-being. We take advantage of reported subjective well-being as a proxy measure for utility and combine it with a theoretically and empirically well-grounded concept for people's aspirations: the individual welfare functions (e.g. van Praag 1971; for a recent survey, see van Praag and Frijters 1999). In research on individual welfare functions, a cardinal relationship between income and expected welfare is established by asking individuals to add income ranges to a number of qualitatively characterized income levels.⁹ Answering this 'income evaluation question', they should take into account their own situation with respect to family and job. People's answers provide information about income that is sufficient to meet their aspiration level, i.e. the income that is required to reach mean expected welfare.

Based on proxy variables for people's income aspirations and their utility level, we can test the following proposition: Individuals' judgements of well-being are affected by their aspiration level Y^* , over and above the effect of income Y and other individual characteristics X . That means that income aspirations Y^* are a characteristic of individual i 's 'utility function'.¹⁰ According to aspiration level theory, higher income aspirations lead to a lower subjective well-being, *ceteris paribus*.

$$U_{i,t} = f(Y_{i,t}, Y_{i,t}^*, X_{i,t}) \quad \text{and} \quad \frac{\partial U_i}{\partial Y_i^*} < 0$$

c) Empirical test of the role of income aspirations

The proposition is empirically studied, using survey data for Germany from the German Socio-Economic Panel Study (GSOEP).¹¹ The GSOEP is one of the most valuable data sets for studying individual well-being over time. It was started in 1984 as a longitudinal survey of private households and persons in the Federal Republic of Germany and was extended to residents in the former German Democratic Republic in 1990. From this survey, we use the two waves of 1992

⁹ For example, "Please try to indicate what you consider to be an appropriate amount for each of the following cases. Under my/our conditions, I would call a net household income per [month] of: about _____ very bad [...] about _____ very good. Please enter an answer on each line [...]" (van Praag 1993).

¹⁰ For convenience, an extended utility function is used rather than a state-dependent utility function $U_i = U_{i,Y^*}(Y_i, X_i)$ with the aspiration level Y^* defining the state.

¹¹ For a detailed description of the GSOEP, see Burkhauser et al. (2001) and Haisken-DeNew and Frick (2001).

and 1997 that contain information about individuals' aspiration levels. Observations for the two waves are from all the samples available in the scientific use file (samples A to F). People in the survey are asked a wide range of questions with regard to their socio-economic status and their demographic characteristics. Moreover, they report their subjective well-being and their income aspirations. Reported subjective well-being is based on the question "How satisfied are you with your life, all things considered?" Responses range on a scale from 0 "completely dissatisfied" to 10 "completely satisfied". Income aspirations are captured by the question "Whether you feel an income is good or not so good depends on your personal life circumstances and expectations. In your case – the net household income _____ DM is just sufficient income."¹² For the proxy of people's aspiration levels, on average, an amount of DM 3,800 per month (at prices and purchasing power parities for 1999, approx. Euro 1,950) is reported. Average household income in the sample is DM 4,800 per month (at prices and purchasing power parities for 1999, approx. Euro 2,450).

The empirical analysis starts with a standard microeconomic happiness function. In order to make the interpretation of the results easier, least squares estimations are presented.¹³ Individuals' reported satisfaction is regressed on income, a number of socio-demographic and socio-economic characteristics, as well as on the size of the household. Household income is positively correlated with reported satisfaction with life, *ceteris paribus*. The coefficient implies that doubling household income increases life satisfaction by 0.334 points on the ten-point scale.¹⁴ The results for household size incorporate the fact that household income has to be shared among household members. However, household size also captures the fact that people live with others in what are probably close and supportive relationships. The results in panel A of table 1 indicate that the two effects of household size on satisfaction with life have a negative net effect. Women are slightly more satisfied with life than men. People with a partner report, on average, higher satisfaction

¹² The proxy measure is focused on one category of the income evaluation question. In addition, people were asked what income they consider to be 'very low', 'low', 'still insufficient', 'good' and 'very good'.

¹³ Theoretically, ordered probit or logit estimations would be more appropriate to exploit the ranking information contained in the originally scaled dependent variable 'satisfaction with life'. The respective results show that the estimation coefficients in the least squares estimations and the average marginal effects in ordered probit estimations are very similar. The respective estimates can be obtained from the author.

scores than those without. The partial correlation between age and life satisfaction is u-shaped with a minimum around age 50. People with more years of education report higher satisfaction scores than those with less years of education. Lower satisfaction scores are reported by self-employed people, non-working people, unemployed people, people living in Eastern Germany and non-EU foreigners (compared to employees, people living in Western Germany and nationals).

[Table 1 about here]

In panels B and C, the happiness function is extended to include the proxy measure for individuals' aspiration levels. It is thus tested whether, according to our proposition, individuals' judgement of well-being is relative to their income aspirations. The results in panel B show that a negative effect on subjective well-being is estimated for the measure of individuals' income aspirations. This means that people experience lower well-being when they have higher income aspirations, given their income level. A doubling of the aspiration level - measured by the income that is evaluated as 'just sufficient' - reduces reported life satisfaction, on average, by 0.191 points. This result supports the basic underlying hypothesis that people's subjective well-being is negatively affected by their income aspiration level, controlling for the effect of income and other individual characteristics.

For the demographic control variables, coefficients similar in size to panel A are estimated. In contrast, the effect of household income on life satisfaction is larger (0.534) than in panel A. This indicates that, for a given aspiration level, higher income has a greater effect on well-being. The change in the size of the coefficient for household income provides indirect evidence that people adjust their aspiration levels according to their income level (see also the discussion in the next subsection).

An alternative interpretation of the results in estimation B suggests that the inference is clouded by unobserved personality traits that influence individuals' aspirations, as well as how they

¹⁴ The coefficient in table 1 refers roughly to a tripling of household income, because the logarithmic specification means that an increase of the transformed income variable by one is equivalent to an increase of household income by a factor e , i.e. approximately 2.718.

respond to subjective well-being questions. For instance, competitive people who have high aims in life may report higher aspirations and may also report lower satisfaction with life because they want to leave room for improvement. As a result, the observed correlation would be biased. However, idiosyncratic effects that are time-invariant can be controlled for if the same individuals are re-surveyed over time. This is the case for our longitudinal data set, in which it is possible to consider a specific baseline well-being for each individual. The statistical relationship between income aspirations and reported subjective well-being is then identified by the change in aspirations between 1992 and 1997 for the same person.

Estimation C in table 1 reports the result for an estimation with individual fixed effects that excludes spurious correlation due to time-invariant unobserved characteristics of people. Partial correlations again show a sizeable negative effect of income aspirations on life satisfaction. A doubling of the aspiration level reduces reported life satisfaction, on average by 0.237 points. Thus the results of the pooled estimation are confirmed.

d) Interpretation

The evidence presented indicates that people's well-being is better understood when their income aspirations are taken into consideration. Income aspirations are thus one aspect of a psychologically sounder concept of utility. With this extension, various empirical observations can be explained. For example, if average aspirations in society increase at the same rate as income per capita, it can be better understood why people in industrialized societies did not become happier over the last decades, despite substantial growth in their economic wealth. This is consistent with citizens' voting behavior. It is found that citizens support the incumbent parties when economic conditions are good. However, citizens take into consideration the unemployment rate and the inflation rate much more than the rate of income growth (e.g. Nannestad and Paldam 1994). Another observation that can be better understood is the low correlation between income and reported subjective well-being. If people evaluate their economic well-being relative to their aspirations, rather than in an absolute way, a fraction of people in an objectively bad economic situation may still be highly satisfied, and another fraction of people living under objectively good economic conditions may still report being highly dissatisfied.

The extension of the utility concept with a proxy measure for aspirations leads immediately to the following questions: What factors determine people's income aspirations? Is there empirical

evidence for the two processes that have been theoretically put forward as forming individual aspirations?

First, research on hedonic adaptation studies processes that reduce the effects of repeated sensory and cognitive stimuli (e.g. Frederick and Loewenstein 1999). With regard to income, there is the notion that we get ‘used to’ a higher income level. After a period of enjoyment, the hedonic effects of higher consumption adapt to a base level and cognitive changes in interests, values and goals set in. In this process, people increase their aspiration level. The relation between individual income and income aspirations was empirically studied based on the concept of individual welfare functions by the Leyden group (see e.g. van Herwaarden et al. 1977, van Praag and van der Sar 1988). As a robust result, it was found that aspirations increase with people’s income level. Moreover, the results indicate that a higher income is not fully translated into higher income aspirations. Van Praag and his co-researchers find that the preference shift through higher individual income ‘destroys’ about 60 percent of the expected welfare effect of an increase in income.

Second, there are social comparisons with relevant others. It is not the absolute level of income that matters most, but rather one’s position relative to other individuals. Socially comparative, or even competitive, processes in consumption complement processes of hedonic adaptation. The empirical analysis of social comparisons is, however, difficult because one has to identify *who* the other people are that build the relevant reference group. For Veblen (1899), rich families like the Vanderbilts are setting the reference standards. For Duesenberry (1949), keeping up with the neighboring Joneses drives the consumption aspirations. However, reference groups are only partly exogenously given, but to some extent actively chosen (Falk and Knell 2000). Even TV families in people’s favorite soap operas may become the relevant others (Schor 1998).¹⁵ Based on the same proxy measure for income aspirations as applied here, the effect of social

¹⁵ In a study of 5,000 British workers, Clark and Oswald (1996) formed the reference group, comprising persons with the same labor market characteristics. They conclude that the higher the income of the reference group, the less satisfied people are with their job. Social comparisons within the family are studied by Neumark and Postlewaite (1998) in order to test the role of relative income for utility. They find that the decision of a woman to go for paid work depends on whether her sisters and sisters-in-law are employed, and how much they earn in their job. In a recent study for Germany, Ferrer-i-Carbonell (2002) combines individuals with a similar education level and age to an exogenous reference group. She finds a negative effect of this group’s comparison income on reported satisfaction with life.

comparisons has been studied across Swiss communities (Stutzer in press). It is found that individuals' aspirations are systematically affected by the average income in the community where people live. The richer one's fellow residents are, the higher is an individual's aspiration level. This effect cannot be explained by a higher cost of living alone. It is shown that the aspiration levels of community members, who interact within the community, react much more to changes in average income than those of members who do not interact.

4.2 Theories of Marriage: Which Couples Benefit?

The second application refers to the possibility of new tests of economic theories and predictions using data on subjective well-being. This data provides an alternative way (i) of discriminating between theoretical models that can explain similar patterns in behavior but lead to different predictions in individuals' levels of utility and (ii) of assessing auxiliary assumptions that often play a crucial role in the predicted behavior and equilibrium outcome of economic models.

One field in which different auxiliary assumptions lead to completely different predictions is family economics (Pollack 2002). Becker's seminal work on the economics of marriage (1973, 1974a) is based on the gains married people get from household production and labor division.¹⁶ Other theories focus on spouses' joint consumption of household public goods, or on reciprocity and social equality in homogamous¹⁷ relationships. In the latter case, it is argued that the tendency for "like to marry like" facilitates compatibility of spouses' basic values and beliefs. While based on Becker's model, mating is predicted to be negatively assortative on (shadow) wages, it is predicted to be positive assortative on education in the case of homogamous relationships. In order to study the validity of the assumption underlying these two sets of models, data on subjective well-being can be studied to provide systematic evidence as to who benefits more and who benefits less from marriage.

In this section, we draw on our research which is more fully described in Stutzer and Frey (2003a). Our empirical analysis studies whether couples with different potentials for

¹⁶ The progress in the theoretical analysis of marriage in economics is surveyed, e.g. in Weiss (1997) and Brien and Sheran (2003).

¹⁷ Homogamy describes the tendency for "like to marry like". People of similar age, race, religion, nationality, education, attitudes and numerous other traits tend to marry one another to a greater degree than would be found by chance (see e.g. Hughes et al. 1999).

specialization of labor and more or less difference in education systematically differ in their benefits from marriage.

a) The effects of marriage on spouses' well-being

With marriage, people engage in a long-term relationship with a strong commitment to a mutually rewarding exchange. The spouse expects some benefits from the partner's expressed love, gratitude and recognition, as well as from security and material rewards. This is summarized in the protection perspective of marriage. From the protective effects, economists have, in particular, studied the financial benefits of marriage. Marriage provides basic insurance against adverse life events and allows gains from economies of scale and specialization within the family (Becker 1981). With specialization, one of the spouses has advantageous conditions for human capital accumulation in tasks demanded on the labor market. It is reflected in married people earning higher incomes than single people, *ceteris paribus* (e.g. Chun and Lee 2001).

There are a wide range of benefits from marriage that go beyond increased earnings. These benefits have been studied in psychology, sociology and epidemiology. Researchers in these fields have documented that, compared to single people, married people have better physical and psychological health (e.g. less substance abuse and less depression) and that they live longer. The evidence for the effects on health has been reviewed, e.g. in Burman and Margolin (1992) and Ross et al. (1990). Waite and Gallagher (2000) additionally survey evidence on income, mortality, children's achievements and sexual satisfaction. A survey that is focused on longitudinal evidence is by Wilson and Oswald (2002).

Recently, there has been an increasing interest in the effect of marriage on people's happiness. It has been found that marriage goes hand in hand with higher happiness levels in a large number of studies covering different countries and time periods (e.g. Diener et al. 2000, Stack and Eshleman 1998, see also Coombs 1991 and Myers 1999 for surveys). Married persons report greater subjective well-being than persons who have never been married or have been divorced, separated or widowed.¹⁸

¹⁸ The possibility of reversed causation is discussed and empirically studied, e.g. in Mastekaasa (1992) and Stutzer and Frey (2003a).

What characterizes couples who gain the most from marriage? This question sheds light on the channels providing the benefits from marriage. Here, related evidence is used to assess the crucial auxiliary assumptions in models of the marriage market. Economists have focused on the gains from specialization in household production, while sociologists and psychologists have emphasized increased emotional support and relational gratification. The latter is often related to homogamous couples, for instance with regard to social status measured in spouses' level of education.

b) Empirical analysis of the differences in happiness of married people

The two claims about the major sources of increased well-being in marriage are directly tested with data on reported satisfaction with life. As in the first application, we use panel data from the GSOEP. We restrict our analysis to people who got married during the 17 years of the sampling period and observe their well-being around marriage. Figure 1 shows average life satisfaction in the years before and after marriage, based on 21,809 observations for 1,991 people in Germany between 1984 and 2000. Average scores are calculated after taking respondents' sex, age, education level, parenthood, household income, household size, relation to the head of the household, labor market status, place of residence and citizenship status into account.

[Figure 1 about here]

The graph in figure 1 shows a noticeable pattern: As the year of marriage approaches, people report, on average, higher satisfaction scores. In contrast, after marriage, the average reported satisfaction with life decreases.

Several concepts may explain this pattern. Some psychologists put forward an event explanation that marital transitions cause short-term changes in subjective well-being (e.g. Johnson and Wu 2002). Others take it as evidence of adaptation (Lucas et al. 2002). Adaptation in the marriage context means that people get used to the pleasant (and unpleasant) stimuli they get from living with a partner in a close relationship, and after some time experience more or less their baseline level of subjective well-being. Whether this adaptation is truly hedonic, or whether married

people start using a different scale for what they consider a satisfying life (satisfaction treadmill), is difficult to assess.¹⁹

In the current study, we are less interested in these patterns as such than in the large differences in life satisfaction for the newly married. In the first year after marriage, the standard deviation of reported satisfaction with life is 1.60 around a mean of 7.64. In the second year, the standard deviation is 1.59 and the mean 7.43 (on a scale between 0 for “completely dissatisfied” and 10 for “completely satisfied”). These numbers indicate that there are large differences in how spouses feel in their lives as newly-wed couples. Here, it is studied whether there are systematic differences for some sub-groups identified in theories of the marriage market.

First, the potential for specialization is studied. One of the main predictions of Becker’s theory of marriage is that the gain from marriage is positively related to couples’ relative difference in wage rates (1974b, p. S11). The reason is that a large relative difference in wage rates makes specialization between running the household and participation on the labor market more beneficial.

The hypothesis is studied graphically in figure 2. The sample is divided into a group of couples who, on average, have above median relative difference in wage rates and one with below median difference.²⁰ The averages presented are estimated *ceteris paribus*. However, not all the control variables mentioned for figure 1 are included. As specialization is expected to provide benefits through increased household production, household income (as well as its close proxy education level) is not controlled for.

[Figure 2 about here]

¹⁹ There is also a selection explanation for the pattern. Many people might only marry if they expect to experience a rewarding relationship in the future. They predict their future well-being as spouses based on their current well-being. Therefore, the last year before marriage becomes the last year, because the couples experience a particularly happy time in their relationship.

²⁰ Relative wage rates can be calculated because each person in the sample is matched with the socio-demographic characteristics of his or her spouse. Shadow wage rates for years during which the respondent or his or her spouse was not in the active labor force are estimated by using a simple procedure. Wages are approximated by the wage earned before or after the break - whatever was chronologically closer. It is assumed that in case a person were to

Figure 2 shows that there are no systematic differences in subjective well-being for the two groups in the years after marriage. However, *before* marriage, those individuals who will be in marriages with large differences in relative wage rates are less happy on average than those with small differences.²¹ This indicates that couples with large differences in relative wage rates benefit more from marriage. This is a finding that supports one of the main predictions in Becker's model based on the gains from specialization.²²

Second, possible benefits for homogamous couples are analyzed. Here, we look at couples' differences in the level of education, measured by the number of years of schooling. It is hypothesized that couples with small differences in the level of education gain more from marriage than those with large differences.

Figure 3 presents the result of a graphical analysis, applying the same test strategy as the one previously used for specialization. Now the whole set of control variables, as in figure 1, is included. For the years before marriage, there are no systematic differences in the well-being of people who end up in marriages with small and large differences in education. However, after marriage, couples with differences in education below the median report, on average, higher satisfaction with life. For the first seven years, the joint statistical significance of the differences is higher than 99 percent. This finding supports the hypothesis that couples with similar educational background benefit more from marriage.

[Figure 3 about here]

c) Interpretation

start working again at the time of the interview, he or she would have to accept his or her last wage without general wage increases, or it is assumed that he or she could get as high a wage as the one he or she gets in the future.

²¹ An F-test for the seven dummy variables that capture the differences in life satisfaction in the seven years before marriage is statistically significant at the 95 percent level.

²² Stutzer and Frey (2003a) also study the effect of actual specialization. It is found that actual division of labor seems to contribute to spouses' well-being, especially for women, and when there is a young family to raise.

Basic assumptions about the gains from marriage or protection can be directly studied using data on subjective well-being. We find evidence that supports the specialization hypothesis emphasized in economics. Compared to their life satisfaction before marriage, couples with large relative wage differences, and thus a high potential gain from specialization, benefit more from getting married than those couples with small relative wage differences. However, the finding indicates that there are no systematic differences between the two groups after 7 years of marriage. Our results also support theories emphasizing the importance of similarities between partners. Similar or homogamous partners are expected to share values and beliefs in order to facilitate a supportive relationship. We find that spouses with small differences in their level of education stand to gain, on average, more satisfaction from marriage than spouses with large differences. These tests of two auxiliary assumptions suggest that previous models of the marriage market – either focusing on specialization or on complementarities in consumption – each neglect an important aspect.

5 Concluding Remarks

Many people say that happiness is all they want or what they try to achieve in their life. It follows that economics is – or should be – about individual happiness. Only recently has economics started to address this claim directly and to study people’s reported subjective well-being. In the meantime, research on happiness and economics has produced many interesting findings and insights about human well-being and its determinants.

We argue that future research on happiness in economics has huge potential, but that it needs to be guided more closely by theory. We propose two ways for testing theories of happiness.

First, reported subjective well-being is a proxy measure for utility that is valid enough to contribute to a better understanding of utility itself. With a direct proxy for utility, it is again possible to have a utility concept with psychological content. Happiness research can address aspects like relativity in utility judgements, the prediction of experienced utility or notions of procedural utility. This research is moving towards a concept of utility in economics that reflects more than the satiation of wants.

Second, happiness data offers a new possibility to distinguish different models of behavior. The abundance of theoretical models that can explain particular ‘stylized facts’ in behavior stands in

sharp contrast to empirical research that lacks statistical tests to reject at least some of them based on observed behavior. To the extent that these models make differentiated predictions about people's utility, they become testable and rejectable in turn.

We illustrate both ways of testing theories of happiness by presenting our own studies. Our first application extends the concept of utility to include people's income aspirations. We find that income contributes to people's well-being relative to their aspiration level. The estimated negative effect of income aspirations on reported satisfaction with life is sizeable and confirms the view that models of interdependent preferences and habit formation have much stronger implications for individual welfare than for the prediction of demand behavior (Holländer 2001).

Our second application tests two important assumptions underlying the marriage market in economics and sociology. While economic models focus on specialization and the division of labor, sociology emphasizes the advantages of homogamous relationships. We find evidence in support of both theories. Couples with a bigger potential for specialization, as well as those with smaller differences in the level of education, gain relatively more from marriage.

We forecast a prosperous future for research on happiness in economics. Testing theories of happiness has the potential of making significant contributions to the core of economics.

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TABLE 1 (part 1)
 THE EFFECT OF INCOME ASPIRATIONS ON SATISFACTION WITH LIFE, GERMANY 1992 AND 97
 Dependent variable: satisfaction with life

	A		B		C	
	pooled estimation		pooled estimation		individual fixed effects estimation	
	Coef.	t-value	Coef.	t-value	Coef.	t-value
Household income, ln	0.454	15.39	0.534	16.54	0.327	5.81
Income aspirations, ln			-0.259	-6.06	-0.323	-4.99
No. of household members ^{1/2}	-0.363	-5.83	-0.303	-4.81	-0.321	-2.50
Male			Reference group			
Female	0.055	2.08	0.059	2.23		
Age	-0.049	-7.57	-0.046	-7.06		
Age ²	0.48e-3	6.93	0.45e-3	6.45	0.09e-3	0.53
Years of education, ln	0.155	2.22	0.213	3.03	-1.963	-2.26
No children			Reference group			
Children	0.072	1.73	0.062	1.49	0.047	0.70
Single, no partner			Reference group			
Single, with partner	0.137	1.82	0.165	2.18	0.499	3.07
Married	0.196	3.06	0.227	3.53	0.753	4.25
Separated, with partner	-0.296	-1.25	-0.279	-1.18	0.458	1.17
Separated, no partner	-0.640	-5.08	-0.620	-4.93	0.041	0.18
Divorced, with partner	0.107	1.05	0.145	1.41	0.604	2.74
Divorced, no partner	-0.337	-4.05	-0.331	-3.99	0.340	1.66
Widowed, with partner	0.068	0.43	0.100	0.64	1.505	3.72
Widowed, no partner	-0.065	-0.80	-0.051	-0.63	0.511	2.37
Spouse abroad	-0.277	-1.12	-0.243	-0.99	0.616	1.27
Employed			Reference group			
Self-employed	-0.230	-3.44	-0.242	-3.62	-0.164	-1.36
Some work	-0.019	-0.23	-0.039	-0.49	-0.210	-1.83
Non-working	-0.135	-3.30	-0.151	-3.68	-0.188	-2.67
Unemployed	-0.857	-16.89	-0.871	-17.16	-0.734	-10.23
Maternity leave	0.165	1.79	0.152	1.65	0.023	0.17
Military service	0.684	1.34	0.658	1.29	-0.196	-0.24
In education	0.086	0.68	0.056	0.44	-0.309	-1.63
Retired	-0.052	-0.72	-0.069	-0.95	-0.139	-1.24
Western Germany			Reference group			
Eastern Germany	-0.837	-29.29	-0.819	-28.51	-1.009	-4.53

TABLE 1 (part 2)

Nationals	Reference group					
EU foreigners	0.056	1.02	0.059	1.07		
Non-EU foreigners	-0.238	-5.02	-0.237	-5.01		
Year dummy 1997	-0.134	-5.46	-0.141	-5.74	-0.299	-3.55
Constant	7.101	103.98	8.071	46.40	7.857	25.02
Number of observations	19130		19130		19130	
Adjusted R ²	0.102		0.103			
Overall R ²					0.040	

Data source: GSOEP.

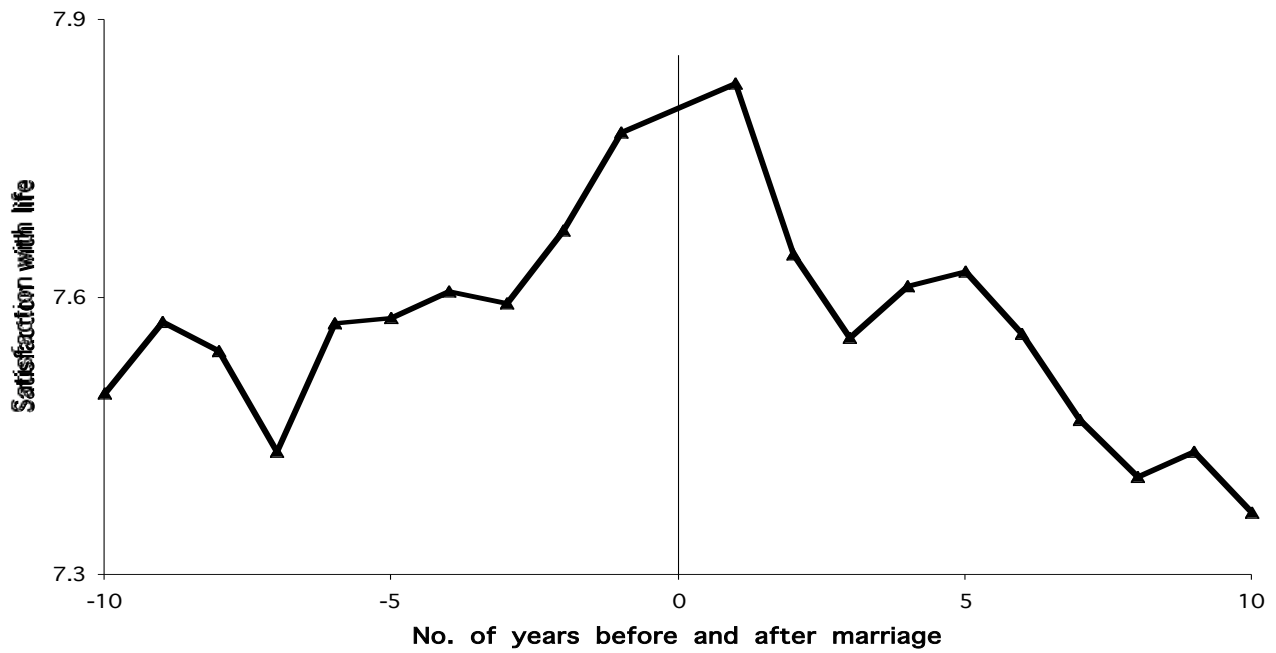


Figure 1: LIFE SATISFACTION AROUND MARRIAGE

Note: The graph represents the pattern of well-being after taking respondents' sex, age, education level, parenthood, household income, household size, relation to the head of the household, labor market status, place of residence and citizenship into account.

Data source: GSOEP.



Figure 2: DIFFERENCES IN THE (SHADOW) WAGE RATE BETWEEN SPOUSES AND ITS EFFECT ON LIFE SATISFACTION AROUND MARRIAGE

Note: The graph represents the pattern of well-being after taking respondents' sex, age, parenthood, household size, relation to the head of the household, labor market status, place of residence and citizenship into account.
Data source: GSOEP.

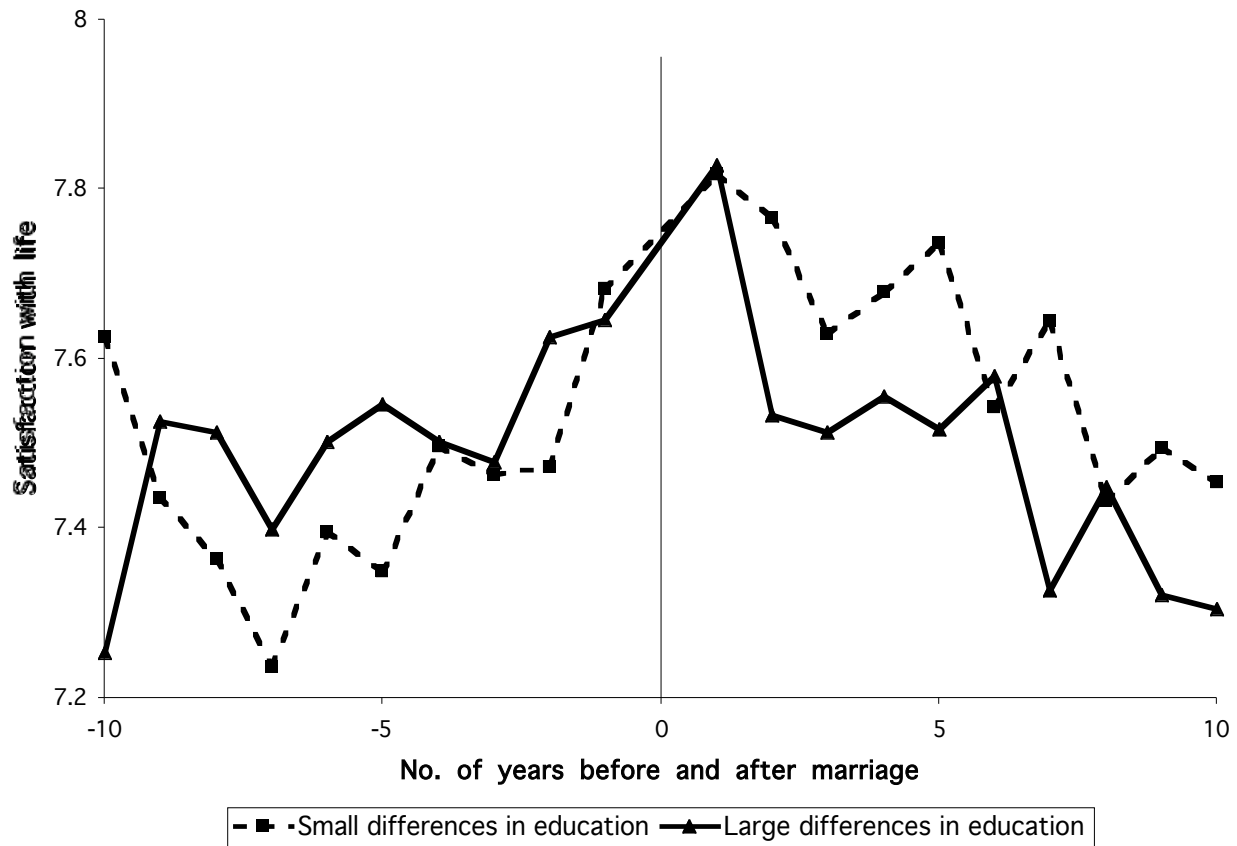


Figure 3: DIFFERENCES IN THE LEVEL OF EDUCATION BETWEEN SPOUSES AND ITS EFFECT ON LIFE SATISFACTION AROUND MARRIAGE

Note: The graph represents the pattern of well-being after taking respondents' sex, age, education level, parenthood, household income, household size, relation to the head of the household, labor market status, place of residence and citizenship into account.

Data source: GSOEP.