

Happiness Research: State and Prospects

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Abstract This paper intends to provide an evaluation of where the economic research on happiness stands and in which interesting directions it might develop. First, the current state of the research on happiness in economics is briefly discussed. We emphasize the potential of happiness research in testing competing theories of individual behavior. Second, the crucial issue of causality is taken up illustrating it for a particular case, namely whether marriage makes people happy or whether happy people get married. Third, happiness research is taken up as a new approach to measuring utility in the context of cost-benefit analysis.

Keywords: causality, cost-benefit analysis, happiness research, life satisfaction approach, marriage, selection, subjective well-being, terrorism

This paper intends to provide an evaluation of where the economic research on happiness stands and in which interesting directions it might develop. While the authors endeavor to provide a fair account, it is strongly influenced by our work undertaken at the chair for economic policy at the University of Zurich. The reader must be warned that other scholars might emphasize different aspects and problems, and in particular consider different future contributions to be important.

The first part of the paper discusses the *current state* of the research on happiness in economics. The survey section is on purpose kept short, mainly because the authors recently provided an extensive review in a journal and in a book (Frey and Stutzer 2002a,b). Here we only want to indicate the general flavor, and to direct the reader not familiar with the approach to the relevant literature. Instead, we emphasize the potential of happiness research in testing competing theories of individual behavior. The second part takes up the crucial issue of *causality* illustrating it for a particular case, namely

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whether marriage makes people happy or whether happy people get married. The third part looks at happiness research as a new approach to measuring utility in the context of *cost-benefit analysis*. We argue that happiness research allows us to well capture the effects of public goods and public bads on utility. Indeed, the approach has several important advantages over the use of contingent valuation surveys and hedonic market evaluations. We illustrate the approach with the example for a major public bad, terrorism. The concluding section discusses some further possible applications of the economic research on happiness.

THE CURRENT STATE OF ECONOMIC HAPPINESS RESEARCH

A Primer in the New Approach

Research on happiness has been one of the most stimulating new developments in economics in recent years. It is devoted to one of the most important issues in life – if not *the* most important issue. The pursuit of happiness is an important determinant of human behavior: “How to gain, how to keep, how to recover happiness is in fact for most men at all times the secret motive for all they do” (James 1902, p. 76). It follows that economics is – or should be – about individual happiness. In particular, the question is how do economic growth, unemployment and inflation, as well as institutional factors, such as good governance, affect individual well-being? Economic activity is certainly not an end in itself, but only has value in so far as it contributes to human happiness.

However, economists have hitherto been reluctant to carry out any direct study on individual happiness. It is argued that no cardinal measurement of utility is needed to analyze how individuals react to changes in relative prices. The axiomatic revealed preference approach holds that the choices made provide *all* the information required to infer the utility of outcomes. Welfare judgments can be made by resorting to the Pareto criterion and therefore no comparison of welfare levels among individuals is required.

This view still dominates in economics. However, numerous scholars have challenged standard economic theory from different angles. There are countless examples of non-objectivist theoretical analyses in economics. They incorporate emotions, self-signaling (self-esteem), goal completion, mastery, meaning and status. In order to explain human behavior, interdependent utility functions are considered rather than interpersonally independent ones. In the vast literature on anomalies in decision-making, it is questioned whether utility can generally be derived from observed choices. The same

reservation holds for inter-temporal choices when individuals suffer problems of self-control. Finally, the outcome orientation in economics is supplemented with individuals' concerns about the conditions and processes which lead to outcomes. People thus gain procedural utility over and above traditional outcome utility.¹ The exclusive reliance on an objectivist approach by standard economic theory is thus open to doubt, both theoretically and empirically. In any case, it restricts the possibility of understanding and influencing human well-being.

Today, we are witnessing a dramatic *challenge* to traditional economic thinking. Due to extensive work by numerous psychologists spanning many decades (recent surveys are Diener *et al.* 1999, Kahneman *et al.* 1999), the measurement of utility has made great progress.² It is now possible to approximate individual utility in a satisfactory way, using representative surveys. With the help of a single question, or several questions on global self-reports, it is possible to get indications of individuals' evaluation of their life satisfaction or happiness. Behind the score indicated by a person lies a cognitive assessment to what extent their overall quality of life is judged in a favorable way (Veenhoven 1993).³

A prominent example of a single-item question on an eleven-point scale is in the *German Socio-Economic Panel* (GSOEP). It asks 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". Another prominent survey is that of the *Euro-Barometer*. Covering all members of the European Union, it asks a similar question to the GSOEP: "On the whole, are you very satisfied, fairly satisfied, not very satisfied, or not at all satisfied with the life you lead?" Among the multiple-item approaches, the most prominent is the *Satisfaction With Life Scale* (Pavot and Diener 1993), composed of five questions, rated on a scale from one to seven.⁴

As subjective survey data are based on individuals' judgments, they are, of course, prone to a multitude of systematic and non-systematic biases

1 Many aspects of the criticism of traditional economics are developed in what is called "behavioral economics" or "economics and psychology" (see e.g. Camerer *et al.* 2003; Frey and Stutzer 2001; Rabin 1998). An introduction to the concept of procedural utility is provided by Frey *et al.* (2004a).

2 A promising new approach, the day reconstruction method (DRM), looks at emotional characterizations of daily life experiences (Kahneman *et al.* 2003)

3 Subjective well-being is an attitude consisting of the two basic aspects of cognition and affect. "Affect" is the label attached to moods and emotions. Affect reflects people's instant evaluation of the events that occur in their lives. The cognitive component refers to the rational or intellectual aspects of subjective well-being. It is usually assessed with measures of satisfaction. It has been shown that pleasant affect, unpleasant affect and life satisfaction are separable constructs (Lucas *et al.* 1996).

4 A survey about various measures of subjective well-being is provided by Andrews and Robinson (1991).

(Schwarz and Strack 1999). The relevance of reporting errors, however, depends on the intended usage of the data. Often, the main use of happiness measures is not to compare levels in an absolute sense, but rather to seek to identify the determinants of happiness. For that purpose, it is neither necessary to assume that reported subjective well-being is cardinally measurable, nor that it is interpersonally comparable. Higher reports of subjective well-being for one and the same individual has solely to reflect that she or he experiences more true inner positive feelings. Whether happiness measures meet this condition has been widely assessed in psychological evaluation studies and Diener (1984) concluded in an early survey that “[the] measures seem to contain substantial amounts of valid variance” (p. 551).

In addition to this precondition for studying the determinants of happiness, further conditions have to be met if welfare comparisons are undertaken on the basis of reported subjective well-being. These conditions are cardinality and interpersonal comparability of the individual statements of well-being. Economists are likely to be skeptical about both claims.⁵ Evidence has, however, been accumulated that both of them may be less of a problem on a practical level than on a theoretical level (e.g. Kahneman 1999). Happy people are, for example, rated as happy by friends and family members (e.g. Sandvik *et al.* 1993), as well as by spouses. The existing state of research suggests that, for many purposes, happiness or reported subjective well-being is a satisfactory empirical approximation to individual utility.

Provided that reported subjective well-being is a valid and empirically adequate measure for human well-being, it can be modeled in a microeconomic happiness function $W_{it} = \alpha + \beta X_{it} + \varepsilon_{it}$. Thereby, true well-being serves as the latent variable. $X = x_1, x_2, \dots, x_n$ are known variables, like sociodemographic and socioeconomic characteristics, or environmental, social, institutional and economic conditions for individual i at time t . The model allows for the analysis of each factor that is correlated with reported subjective well-being separately. This approach has been successfully applied in numerous studies on the correlates of happiness. Technically, multiple regression analyses are conducted. As the dependent variable is measured on a ranking scale, normally ordered logit or probit estimation techniques are applied.

The result is a substantial amount of new and insightful empirical findings. Present research provides some preliminary insights on issues dealing, for

⁵ But it should be noted that this skepticism coexists with well established propositions in the literature on income inequality and poverty, taxation and risk that accept implicit cardinal utility measurement and interpersonal comparability.

example, with the relationship between happiness and income, unemployment, inflation, inequality and democratic institutions (for overviews see Easterlin 2002; Frey and Stutzer 2002a,b; Oswald 1997; van Praag and Ferrer-i-Carbonell 2004; Layard 2005).

A New Way of Testing Economic Models of Individual Behavior

Wage discrimination by race and gender. Wage gaps between people of different race or sex have proved persistent, as well as resistant to conclusive explanations (Altonji and Blank 1999). For many observations of wage gaps, it cannot be said whether they reflect taste based discrimination by employers, fellow employees or customers, statistical discrimination, social norms about appropriate work behavior or unobserved productivity differences (rather than any sort of discrimination). Proxy measures on workers' well-being help us to understand possible relationships between wage gaps and discrimination. For example, it can be directly tested whether white employees have a taste for discrimination against ethnic minorities at their workplace. In an empirical analysis for the UK, Frijters *et al.* (2003) find, on the one hand, that white male (but not female) employees report lower levels of job satisfaction the larger the proportion of ethnic minority co-workers. Consistent with employee discrimination, they find, on the other hand, that men's wages increase with the concentration of fellow employees from ethnic minorities.

A comparison of wage and satisfaction gaps also creates a new puzzle: It is a well established statistical finding that women earn less than men on the labor market (see e.g. Blau and Kahn 2000). Nevertheless, women do not report significantly lower satisfaction with their life or their job and, in countries like the United States, Great Britain or Switzerland, they even report higher job satisfaction than men (see, e.g., Clark 1997; Sousa-Poza and Sousa-Poza 2000). To the extent that the gender wage gap is thought to be due to active discrimination, one would expect women to experience lower well-being than men, *ceteris paribus*. This empirical finding can, however, be understood when there are systematically different standards for women and men about appropriate pay. Based on proxy information for such gender specific appropriate pay, Lalive and Stutzer (2004) find that the gender wage gap is lower in more liberal communities. In contrast to an explanation in terms of active discrimination in traditional communities, life satisfaction of women is higher (not lower) in traditional communities with the larger gender wage gap. These two findings support an understanding of gender differences in salaries in terms of an internalized reference standard.

Rational addiction versus problems of self-control. 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 cents⁶ 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.

Compensating wage differentials. Many economic theories are based on perfectly competitive labor markets on which job amenities and disamenities are compensated. The idea of compensating wage differentials has been tested extensively (see, e.g., Viscusi 1993). While wage differentials across occupations and industries are common, it is very difficult to assess whether they reflect unobserved job or industry characteristics or rents. Based on proxy data for workers' utility like reported job or life satisfaction, it is possible to address this issue in a direct way. In theory (with homogenous individuals), if compensation is complete, no correlation between wage rate and utility is estimated. This proposition can directly be taken as a first step to testing compensating wage differentials. Two recent studies apply this approach. Clark (2003) studies the UK and finds positive and significant rents for some occupations. Lalive (2002) studies moonlighters in the US in order to compare different jobs for the same person in the same year. He

⁶ 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).

finds that industry wage differentials reflect the presence of rents on the labor market rather than compensation for work conditions.

THE ISSUE OF CAUSALITY

A happiness function implicitly assumes that the right hand variables (the sources of happiness) *determine* (in a stochastic sense) the level of individuals' subjective well-being as the dependent variable. However, in many cases there may also be a reverse causation: The level of happiness may at the same time have an effect on the right hand variables.⁷ This section points at this fundamental issues using the example of the relationship between happiness and marriage. Does happiness cause people to be happier, or are happy people more likely to get married?⁸ Other recent applications, explicitly addressing the issue of causality are, for example, on schooling and volunteering.

Cheerful characters may be more successful in school and thus more likely to invest in their human capital. In order to study the effect of additional schooling on life satisfaction, Oreopoulos (2003) takes an increase in mandatory school years in the UK as an exogenous change in human capital formation. Based on this identification strategy, a sizeable positive partial correlation between education and subjective well-being is found. Astonishingly, the partial correlation turned out similar in magnitude to the one measured without the instrumental variable.

Reversed causality is naturally coming in mind when thinking about pro-social behavior and individual well-being. While moral thinkers emphasize that happiness comes through pro-social behavior or virtue, there are also many psychological studies that find that happy people are more likely to act pro-socially like to help others. In order to study the causal effect of volunteering on life satisfaction, Meier and Stutzer (2004) take advantage of a natural experiment: the collapse of East Germany and its infrastructure of volunteering. People who accidentally lost their opportunity for volunteering are compared to people who experienced no change in their volunteer status. It is found that those deprived from their possibilities to volunteer experience a decrease in life satisfaction relative to those who still volunteer after reunification.

7 There are, of course, many more causality issues or reasons why observed correlations do not reflect a causal link. Important examples are omitted variables generating spurious correlations.

8 We draw on our research more fully described in Stutzer and Frey (2003).

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. These aspects are 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).

The benefits from marriage 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 (see, e.g. Burman and Margolin 1992; Waite and Gallagher 2000).

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). Married persons report greater subjective well-being than persons who have never been married or have been divorced, separated or widowed.

The major sources of increased well-being in marriage are directly tested with data on reported satisfaction with life. 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.

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

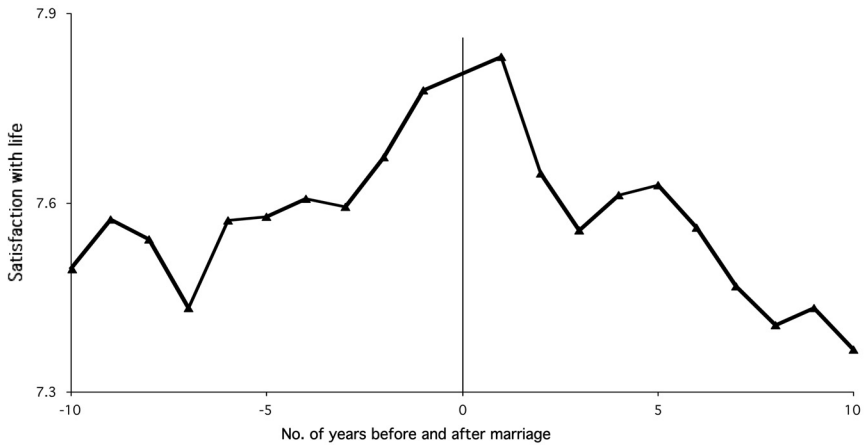


Figure 1: Life Satisfaction Around Marriage.

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.

of adaptation (Lucas *et al.* 2003). 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.⁹

The Effect of Happiness on Marriage Choice

Married people on average report higher subjective well-being than singles. Does marriage make happy or is marriage an institution for the happy and joyful crowd that finds a partner? It may be supposed that those who get married are intrinsically happier people, i.e. happy people self-select into marriage.

9 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.

In order to test this selection hypothesis (see also Mastekaasa 1992), we follow a simple approach and compare two different groups of singles. The level of subjective well-being of singles who marry later in life is contrasted with the well-being of those who stay single, controlling for numerous observable characteristics. For any given age, a comparison of the average life satisfaction in these two groups indicates systematic heterogeneity to some extent. However, it has to be taken into consideration that the years immediately before marriage might not be representative for a person's intrinsic happiness level. People might live in a marriage-like relation, as cohabitants, thinking and planning their joint future in a loving relationship. As these years end in marriage, they are more likely to be the best years in life. Therefore, we only study singles 4 or more years away from marriage. Those expected to stay single represent the comparison group. This criterion has to be made tractable in a panel spanning only 17 years. In particular, if observations for young age groups are wanted. The category of "remained single" is therefore defined as those who are not married while in the sample, and can be observed at least until the age of 35. People in the sample marry, on average, at the age of 27 (std. dev. 5.9).

Figure 2 shows the result of the analysis for German data between 1984 and 2000. The reported average satisfaction scores are calculated, taking respondents' 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.

The graph reads as follows: If singles at the age of 20 are asked about their satisfaction with life, the well-being of those who will marry later is higher than of those who will stay single throughout their life. The difference between the two dummy variables for age 20/21 is 0.31 (std. err. 0.16) satisfaction scores. If the singles who have not married before the age of 30 report their subjective well-being, those who will marry report, on average, roughly equal satisfaction scores to those who will not marry. Above the age of 30, singles who will marry in the future are on average reporting higher satisfaction scores than those who stay single, with an increasing gap. These differences (marked as shaded areas) are indicating the degree of selection in the relationship between marriage and happiness. Around age 20, the selection of people who will marry in the future includes a lot of singles whose happiness level is above average. Around the age of 30, the group of people who will marry in the future cannot be distinguished from the ones staying single. This is interesting, as one might expect an increasing gap between the happiness level of the two groups: among those who are still single at a higher age, it is mainly the happiest who are expected to marry.

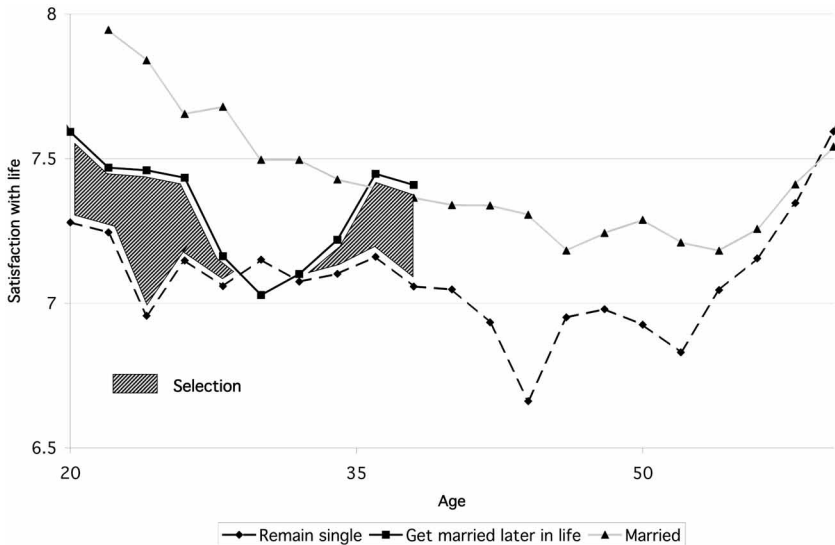


Figure 2: Do Happy People Get Married?

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.

This correlation is in fact visible above age 30. Overall, the selection patterns indicate that selection effects are the largest for those who marry at a young age and those who marry late in life.

A NEW APPROACH TO COST-BENEFIT ANALYSIS

The Life Satisfaction Approach

The benefits from public goods are inherently difficult to measure and a wide variety of different approaches for the measurement of preferences has been developed (see, e.g., Freeman 2003). With reported subjective well-being as a proxy measure for utility, it is now a straightforward strategy to directly evaluate public goods in utility terms. By measuring the marginal utility of a public good or the marginal disutility of a public bad, as well as the marginal utility of income, the trade-off ratio between income and the public good can be calculated. We call this the life satisfaction approach.

The life satisfaction approach can be used to value a wide range of different public goods and bads, negative and positive externalities. Hitherto,

the approach was exclusively used to value externalities in the environmental realm. Van Praag and Baarsma (2005) were the first authors to use life satisfaction data explicitly for the evaluation of externalities. They analyze the effect of noise nuisance in the area of the Amsterdam Airport using individual data. Because subjective well-being is influenced by perceived rather than objective noise levels, and because the former depends not only on the latter, but also on a number of intervening variables, like the presence of noise insulation and individual characteristics, the estimated compensations vary considerably for different groups of persons. Cross-country analyses are conducted by Welsch (2002) and Rehdanz and Maddison (2003). Welsch (2002) identifies a negative effect of urban air pollution (more precisely the amount of nitrogen dioxide) on average life satisfaction that translates into considerable monetary values of improved air quality. Rehdanz and Maddison (2003) investigate the relationship between happiness and climate, and calculate the necessary change in GDP per capita to hold happiness at its current levels in the face of predicted climate changes.

The life satisfaction approach has several advantages over the most prominent revealed preference methods and stated preference methods.

Surveys based on contingent valuation. In this approach, respondents are asked to value a specific public good.¹⁰ This is often an unfamiliar situation and gives rise to problems of strategic responses. Therefore, the credibility, validity and reliability of results based on contingent valuation are the subject of heated controversy in economics. A number of guidelines have been developed to assure credibility, validity and reliability. The most important are the presentation of adequate information, the choice of a credible (hypothetical) payment mechanism and the use of the referendum format, the only elicitation format that is – at least under certain circumstances – incentive-compatible (Arrow *et al.* 1993; Portney 1994).

Nevertheless, the basic problem of the contingent valuation method remains. Due to the hypothetical nature of the questions asked and the unfamiliarity of the task, one cannot exclude that respondents fail to consider the effect of their budget constraints and substitutes. Symbolic valuation in the form of attitude expression and superficial answers are likely to be the result (Kahneman *et al.* 1999). Similarly, the problem of strategic behavior can only be addressed to a limited extent. The life satisfaction

10 See Carson *et al.* (2003) for an elaborate and state-of-the-art contingent valuation study; they estimate individuals' willingness to pay to prevent another Exxon Valdez type oil spill.

approach is not affected by either of these problems. It does not rely on respondents' ability to consider all relevant consequences of a change in the provision of a public good. It suffices if they state their own life satisfaction with some degree of precision. Moreover, there is no reason to expect strategic behavior.

Revealed preference methods. This other group of non-market valuation techniques is based on the idea that, when choosing between different bundles of public and private goods, individuals make a trade-off, revealing something about the value they place on these goods. Under specific circumstances, this enables inferences to be made about individuals' willingness-to-pay for the public good from market transactions in the private good.

The most elegant and most often used approach to use revealed preference is the *hedonic market approach*. If individuals derive utility from a local public good, they prefer to live in regions with a high provision of this good and, hence, bid up housing rents and bid down wages in these regions. The public good is a qualitative characteristic of the differentiated market good housing and of jobs; the housing and labor market thus function as markets for the public good. Wage and rent differentials serve as implicit prices and correspond, in equilibrium, to the individuals' marginal willingness-to-pay for the public good (e.g. Rosen 1974).¹¹ Here lies a first and fundamental problem of the hedonic market approach: the approach is based on the assumption that housing and labor markets are in full equilibrium. This assumption is justified only when households have a very high degree of information, when there is a sufficiently wide variety of houses and jobs, when prices adjust rapidly, when transaction and moving costs are low, as well as when there are no market restrictions (Freeman 2003, p. 366). In contrast, the life satisfaction approach explicitly captures utility losses in the absence of market equilibria. Compensating variation in other markets, however, has to be accounted for in cross-section analyses. If they are not, the life satisfaction approach captures only the residual externality. In this case, the life satisfaction approach and the hedonic market approach complement each other. Another drawback of the hedonic market approach is the need to account for adjustments people are likely to make in response to changes in the

11 Exemplary contributions are Blomquist *et al.* (1988) and Chay and Greenstone (2001). The former estimate compensations for intraurban and interregional differences in amenities in the labor and housing market, the latter investigate the effect of air pollution and successfully address the identification issues hedonic market studies are normally plagued with.

level of an externality, as well as reactions of the supply side of the hedonic market.

A problem common to all methods based on revealed preference is that consumption and relocation decisions are based on perceived rather than objective (dis-)amenity levels; in case people's perceptions and objective measures do not correspond sufficiently, the estimates may be severely biased. The same caveat applies, to some extent, to the life satisfaction approach. However, in contrast to revealed preference methods, the life satisfaction approach captures indirect effects of externalities on individuals' utility through effects on health and the like, even if there are no direct effects. For example, whereas noise nuisance affects utility directly and results in corresponding defense expenditures or relocation decisions, exposure to nuclear radiation can damage health through a process unnoticed by the people, but which nevertheless lowers life satisfaction. In this case, utility losses cannot be measured using revealed preference methods, as there is no behavioral trace. For the same reason, revealed preference methods cannot assess *non-use values* like the existence and bequest value. In this regard, the life satisfaction approach is superior, though it is not able to capture pure existence values (or pure public goods more generally). In addition, behavioral research has shown that there exists a distinction between two notions of utility: *experienced* utility on the one hand and *decision* utility on the other hand. The experienced utility of an outcome encompasses the hedonic experience of that outcome, while the decision utility is the weight an individual assigns to that outcome in a decision (Kahneman 1994). If experienced utility and decision utility systematically differ, decisions in markets for private goods do not accurately reveal people's hedonic experiences from the consumption of public goods.

The Example of Terrorism

Citizens' well-being is systematically influenced by the political process which includes terrorism. It stands to reason that people living in a country rife with terrorism are less happy than those living under more orderly political conditions. A good example is the Dominican Republic in 1962 where, after president Trujillo's murder, the political situation was very unsettled and political chaos was a real threat. The level of life satisfaction measured in that country was the lowest ever recorded, namely 1.6 on the normal 0 to 10 scale. By way of contrast, in politically stable democracies, such as Switzerland, Norway or Denmark, the population expresses high life satisfaction. The corresponding values were, for example, in the 1990s 8.16 for Denmark, 8.02

for Switzerland and 7.66 for Norway. Thus, happiness and political stability seem to be closely related.¹²

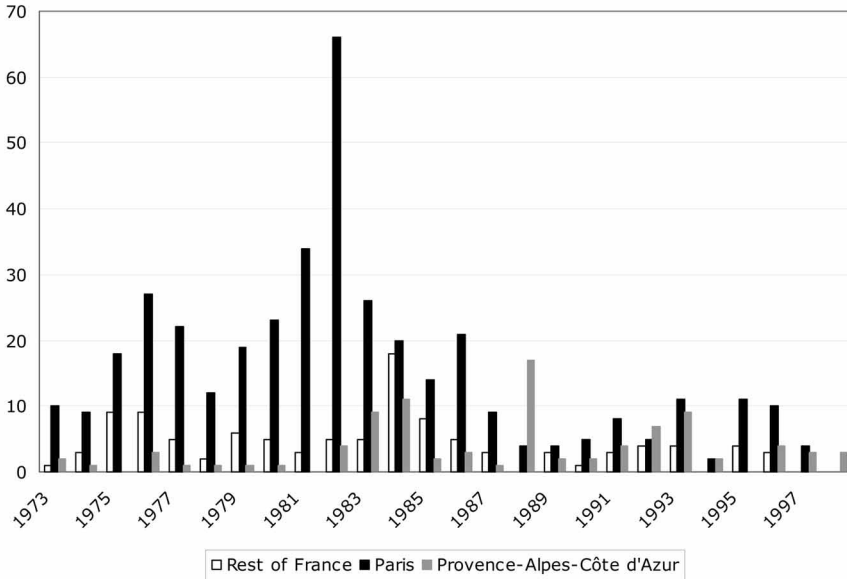
The causation may, however, again run in both directions: while it seems obvious that political unrest is dissatisfying to people, it also stands to reason that dissatisfied people resort to demonstrations, strikes and resort to terrorist actions, therewith creating political instability. But it would be a romantic view (see Tullock 1987) to assume that revolutions are normally caused by people's unhappiness with existing political conditions. Most coups d'état, and even revolutions, are undertaken by competing political clans, parties or the military. There is an exchange of rulers *within* the 'classe politique' itself, only partially fuelled by the people's unhappiness with their rulers. The people's dissatisfaction is often taken merely as an excuse to seize power (see Galetovic and Sanhueza 2000, Weede and Muller 1998, Wintrobe 1998).

Several avenues of valuing the utility losses caused by terrorist activity using life satisfaction data can be pursued. One possibility is to follow the lead taken by macro-happiness functions based on international cross-section and time series analyses, for instance trying to identify the effect of environmental conditions (see e.g. Welsch 2002). Alternatively, the life satisfaction of the population in particular regions and cities affected by terrorism may be compared to the remainder of a country. This novel approach is illustrated here for the case of France but has been applied to more countries (Frey *et al.* 2004b).

Life satisfaction data are taken from the *Euro-Barometer Survey Series* (1970–1999); the variable is the categorical response to the following question: "On the whole, are you very satisfied [4], fairly satisfied [3], not very satisfied [2], or not at all satisfied [1] with the life you lead?" An indicator for the salience and intensity of terrorist activity is constructed on the basis of the *RAND-St. Andrews Chronology of International Terrorism* and the *Terror Attack Database* of the *International Institute for Counter-Terrorism*: the number of terrorist incidents. The two regions of Ile-de-France (including Paris) and Provinces-Alpes-Côte-d'Azur (which includes Corsica in the *Euro-Barometer Surveys Series*) is compared to the rest of France for the years 1973 to 1998. Figure 3 depicts the number of terrorist incidences across these three regions over time.

Based on these data sets, a micro-econometric happiness function is specified. The life satisfaction of an individual living in particular region at

¹² We are, of course, aware that other factors matter too for the observed difference and might even exclusively determine the gap.



	Rest of France	Paris	Provence-Alpes-Côte d'Azur
Mean	4.29	15.63	3.91
Std. dev.	3.95	14.03	4.23
Min	0	0	0
Max	18	66	17

Figure 3: Number of Terrorist Incidents in France, 1973–1998. *Date source:* RAND-St. Andrews Chronology of International Terrorism and Terror Attack Database of the International Institute for Counter-Terrorism.

particular time is explained by differences in the level of terrorism across regions and over time, the individual’s household income, other personal and socio-demographic characteristic, as well as region and time fixed effects.

The estimation results suggest that the number of terrorist attacks has a statistically significant negative effect on reported life satisfaction. For 15 terrorist attacks (i.e. approximately the average number of attacks in Paris during the period studied), an average reduction in satisfaction with life by 0.04 units on the four point scale of life satisfaction is estimated. This effect is about a fifth of the effect of being unemployed rather than employed. Thus, a frequently used indicator for terrorism is correlated with people’s subjective well-being in a sizeable way.

The estimated coefficients can be used to calculate the hypothetical willingness-to-pay for a discrete change in the level of terrorism. For the purpose of comparison, the difference in terrorism between living in the region Ile-de-France (Paris) and living in the rest of France (except Provence-Alpes-Côte d'Azur) is considered. Accordingly, a resident of Paris (with average household income) would be willing to pay around 14% of his income for a reduction in terrorist activity to a level that prevails in the more peaceful parts of the country. These compensations are comparable to those identified by Blomquist, *et al.* (1988) on the labour and housing markets for individuals living in the US county with the highest rate of violent crime. This exploratory application demonstrates that life satisfaction data are well suited to assess the utility loss of the population due to terrorism.

CONCLUDING REMARKS

This paper has presented only a selection of possible applications of economic happiness research. Many more have been undertaken¹³. As noted at the beginning, no attempt has been made to be comprehensive. Rather, the intention was to convey to the reader that happiness research opens new avenues to tackle old questions, and opens new possibilities to address issues which so far have been difficult, or even impossible, to empirically address. The examples provided cover several areas ranging from marriage to terrorism suggesting that the happiness approach may be useful for many different issues. The applications discussed use econometrically estimated happiness functions based on individual data. However, it may well be possible to also use happiness research to address “grand issues” such as those recently brought up by the “Copenhagen Consensus”¹⁴. Relying on analyses undertaken within the United Nations, this initiative identifies ten major challenges to mankind: climate change, communicable diseases, conflicts, education, financial instability, governance and corruption, hunger and malnutrition, population migration, sanitation and water, and subsidies and trade barriers. These challenges are deemed to be solvable by a concerted effort by countries. But it will certainly be impossible to address all of them.

13 Recent further examples are, for instance, Clark (2001) on the scarring effects of unemployment, Di Tella *et al.* (2004) on macro-economic conditions, Frey and Benz (2003, 2004) on independence, Pezzini (2003) on abortion rights, Luttmer (2004) and Stutzer (2004) on relative income and Stutzer and Lalive (2004) on social work norms. Recent methodological contributions are, for example, Winkelmann (2002) on interdependencies in well-being at the family level and Ferrer-i-Carbonell and Frijters (2004) on estimation techniques with fixed effects for ordered happiness data.

14 See www.economist.com/copenhagenconsensus, and the book edited by Lomborg (2004).

It is therefore necessary to have an idea which of these global problems has the most favorable benefit-cost ratio. The current approach relies on income equivalents as a metric to measure the benefits gained by an intervention in order to be able to compare it to its costs. This means, for instance, that the DALY (Disability Adjusted Life Years) must be evaluated in dollars¹⁵. It is obvious that such an approach has serious limits and leaves out of account much of what makes life worthwhile. The happiness approach here presented may, at least in principle, offer a more satisfactory way to address these issues, relying on individuals *own* evaluations with regard to their well-being, and being comparable between areas and persons. Happiness research is not yet far enough advanced to seriously consider such overarching evaluations. Most importantly, the necessary data are missing. Nevertheless, this example shows that the potential of economic happiness research is vast, and that research is still in its infancy.

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15 Collier and Hoeffler (2004) who wrote the background paper on "The Global Incidence of War", take, as they write themselves, the "obviously arbitrary figure of \$1000 to a DALY" (p.6).

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