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**What Happiness Research Can Tell Us About
Self-Control Problems And Utility Misprediction**

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WHAT HAPPINESS RESEARCH CAN TELL US ABOUT SELF-CONTROL PROBLEMS AND UTILITY MISPREDICTION

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Abstract: Neoclassical economic theory rules out systematic errors in consumption choice. According to the basic view, individuals know what they choose. They are able to predict how much utility an activity or a good produces for them now and in the future and they can maximize their utility. This implies that behavior reveals consistent preferences. This approach makes it impossible to detect and understand sub-optimal consumption decisions, due to problems of self-control and the misprediction of utility. We propose the economics of happiness as a methodological approach to study these phenomena. Based on proxy measures for experienced utility, it is, in principle, possible to directly address whether some observed behavior is sub-optimal and is therefore reducing a person's well-being. We discuss recent evidence on smoking and eating habits, TV viewing and commuting choice.

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I. Happiness Research Challenges the Rational Consumer Hypothesis

Neoclassical economic theory relies on revealed behavior in order to evaluate the utility generated by the option chosen in a particular decision. This procedure assumes that individuals are perfectly informed about what brings how much utility and that they are perfectly capable of maximizing it. These assumptions imply that people do not make any systematic mistakes when making decisions. They may, however, commit random errors, but these errors cancel each other out in the aggregate and can therefore be disregarded. These assumptions are extreme and far-reaching. Few non-economists would share the conviction that individuals cannot systematically err.

This paper takes a step beyond standard neoclassical economics: (i) systematic errors in consumption are taken seriously, and (ii) a strategy is proposed to test the assumption that individuals do not commit any systematic mistakes when consuming, and that they therefore reach the highest possible utility level achievable, given the constraints they face.¹

A recent revolution in economics - happiness research - has made it possible to approximate individuals' utility in a satisfactory way for many questions (see Kahneman et al. 1999; Frey and Stutzer 2002a,b; Layard 2005). The consumption *decision* can therefore be separated from the *utility* thereby produced. The research results discussed in this paper suggest that specific consumption decisions taken by particular individuals are not utility maximizing, according to the individuals' *own* evaluation.

The empirical challenge of standard economic theory put forward in this chapter discusses concrete consumption decisions, i.e. it does not remain at an abstract level. The focus is on smoking and eating habits, watching TV and commuting choice. Thereby we draw strongly on empirical research in which the *dependent* variable is reported subjective well-being or life satisfaction and consumption behavior serves as main *explanatory* variable. This approach is promising as it puts forward a proxy for utility to evaluate choice behavior. However, the approach is subject to the same econometric difficulties faced by studies that examine the determinants of behavior, i.e. the possibility of omitted variable and endogeneity bias.

¹ We are aware that there are specific situations in which the standard economic model rules out certain types of behavior and mere observation of a certain action rejects the standard economic model. Studies successfully pursuing this approach are very rare, however. Two important exceptions that document such behavior rejecting the standard model are DellaVigna and Malmendier (2006) who examine gym attendance under different contracts, and Skiba and Tobacman (2005), who show that certain types of payday loans would always be rejected by time-consistent individuals.

Our contribution is structured as follows: Section II discusses the potential of happiness research to explore time inconsistent consumption behavior due to problems of self-control. Section III expands the analysis to the misprediction of utility in general. Section IV offers concluding remarks.

II. Limited Self-control and Individual Well-being

Consumer choice is considered to be the result of rational utility maximization in most micro- and macro-economic analyses. This view is, however, challenged by research in economics and psychology that reports a large number of different anomalies in a real-life decision-making context. Anomalies are understood in the sense of individual behavior violating certain axioms underlying the rational consumer hypothesis (Kahneman et al. 1991). Two of the most challenging deviations from utility maximizing consumption choice are due to people having time inconsistent preferences and mispredicting utility.

Standard economics assumes that people have no self-control problems, but that they are able to make decisions according to their long-term preferences. Viewed this way, consuming goods and pursuing activities that some people consider addictive, or at least forming bad habits, such as smoking cigarettes or taking cocaine, watching TV or driving expensive cars are considered a rational act. Contrary to this view, many people judge their own and other people's consumption behavior as irrational in the sense that they think that they would be better off if they would consume less of these goods and care more for their future well-being. Such self-control problems involve two aspects: myopia and procrastination. In both cases, the present is emphasized at the expense of the long-term. When affected by myopia, people focus on consuming in the present and lack discernment or long-range perspective in their thinking and planning, thus undermining their well-being over time. In this respect, generally goods offering immediate benefits at negligible immediate marginal costs are tempting. Procrastination focuses on putting off or delaying an onerous activity more than a person would have liked when having evaluated it beforehand. In economics, this inconsistent time preference is most prominently formulated in models of hyperbolic discounting (see, e.g., Laibson 1997). A low discount factor (i.e. a discount factor decreased by α , $\alpha \in (0,1)$) is applied between the present and some point in time in the near future and a constant discount factor β thereafter. An excellent account of the recent extensive empirical and theoretical literature on time inconsistent preferences is provided in Frederick et al. (2002).

Based on revealed preference, it is difficult, if not impossible, to discriminate between the view of consumers as rational actors and consumers mispredicting utility or facing self-control problems. Two extensions of the traditional emphasis on *ex ante* evaluation and observed decision are insightful. First, the standard economic concept of decision utility is complemented with the concept of experienced utility (Kahneman et al. 1997). The latter refers to an individual's evaluation of actual experiences in terms of positive and negative affects or satisfaction. This separation of concepts makes it possible that orderings of experiences systematically diverge from orderings of options derived from observed behavior. The second extension is closely related to the first, and emphasizes *ex post* evaluations as a valuable source of information about the possibility of bounded rationality in people's decision-making. How do people fare after they have made decisions? If anomalies interfere in people's decision making, there might well be a gap between what individuals want and what individuals like.

This opens the question of how the (normative) standard is ascertained, whether seemingly irrational behavior should be judged welfare reducing, because it violates certain time consistency criteria. While there is an extended debate on this issue (see, e.g., Bernheim and Rangel 2005b), we use people's own evaluation as a standard when they are not confronted with a particular decision. The empirical approach proposed in the following section, based on individuals' judgments of their current subjective well-being, corresponds precisely with that point of view.

A. Methodological approach: *ex post* evaluation based on experienced utility

Recent advances in psychology on the measurement of subjective well-being and the adoption of these measures in large surveys allow for a new way of approaching the issue of irrational consumption behavior. With such a proxy measure for utility at hand, it can be discriminated between competing theories that make the same predictions concerning individual behavior, but differ in what they put forward as individual utility levels. This kind of test is a powerful tool in challenging theories that proved resistant to a multitude of observed behavior patterns.

We discuss and illustrate the new methodological approach for three specific issues, namely smoking, obesity and TV viewing. First results based on the approach are consistent with complementary evidence, suggesting self-control problems are involved in all three issues.

B. Smoking

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, but experience increased utility when the tax helps to overcome a bad habit. Depending on whether systematic errors in consumption are assumed for particular forms of consumption, like smoking or drinking alcoholic beverages, people might advocate sin taxes to encourage individuals to improve their lot, or oppose them as being discriminatory against particular pleasures in life. In a nutshell, the standard economic model predicts that recent increases in cigarette taxes and restrictions on smoking reduce smoking and make individuals worse off. A model that incorporates self-control problems, however, predicts that smoking is reduced while individual utility is increased.

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 (2005) 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 predicted to smoke at the prevailing tobacco tax. They arrive at the result that a real cigarette tax of 50 cents² significantly reduces the likelihood of being unhappy among those with a propensity to be smokers. In fact, they would, with a 50 cents tax, 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 Moreover, the result shows that price increases can serve as a self-commitment device.

Problems of self-control with smoking also arise due to temptation (Bernheim and Rangel 2005a). Alternative tests would relate the happiness of potential smokers to clean air laws. These tests would capture exogenous changes in cues or moments of temptation. A

² The average real (in 1999 US\$) cigarette tax in the United States is 31.6 cents in the sample (Gruber and Mullainathan 2005, 5).

³ In another study, the negative internality from suffering a self-control problem and being a smoker is assessed (Jürges 2004). The monthly compensation required to make a smoker as well off as a non-smoker is estimated to be approximately Euros 500. However, the effects of smoking on life satisfaction were not identified, based on changes in exogenous conditions restricting the possibilities to smoke.

comparison of results would allow assessing the boundaries of prices as a means of affecting self-regulation.

Research findings on subjective well-being with regard to self-control problems with smoking complement other evidence suggesting self-control problems in a systematic way. There is a large market offering all kinds of drugs and therapies to people who want to stop smoking. In fact, eight out of ten smokers would like to quit smoking and try it every eight and a half months on average (Gruber and Koszegi 2001).

C. Obesity

The marked increase in people being either overweight or obese has been the epidemiological landslide of the last two decades in many western countries.⁴ In many European countries, the prevalence of obesity has risen three-fold or more since the 1980s (WHO Europe 2005). People in Europe have now, on average, a BMI of almost 26.5. The percentage of obese adults varies between 7.7 percent in Switzerland and 22.4 percent in the United Kingdom and the Slovak Republic (see figure 1). A BMI above 21 accounts for 10-13 percent of deaths and 8-15 percent of healthy days lost due to disability and premature mortality (DALY) in the European Region (World Health Organization 2002). In the United States, adult obesity rates have more than doubled since the 1980s. In the year 2000, three in ten adults were classified as obese (Flegal et al. 2002).

A debate has started about the economic causes of this phenomenon, as well as its consequences (see, e.g., Cutler et al. 2003; Finkelstein et al. 2005). Increased obesity has been explained by the relationship of energy expenditure to energy intake. Energy expenditure is lower nowadays because manual labor has been replaced by more sedentary work due to technological changes (Lakdawalla and Philipson 2002). However, this trend started long before the obesity endemic took off. The increase in calories consumed fit the obesity pattern better and is of sufficient magnitude to account for its increased prevalence (Putnum and Allshouse 1999). In particular, higher snack calories are responsible for higher energy intake for men and even more so for women (Cutler et al. 2003).

What is the economic rationale behind the shifting energy household? Looking at relative prices suggests that, since the early 1980s, they decreased for calorie-dense foods and drinks relative to fruits and vegetables, which are less energy-dense (Finkelstein et al. 2005). These

⁴ Overweight and obesity is defined relative to people's weight to height ratio in metric units, as captured in the body mass index (BMI): $BMI = kg/m^2$. Adults with a $BMI \geq 30 \text{ kg/m}^2$ are classified as obese and those with a $BMI \geq 25 \text{ kg/m}^2$ as overweight.

price reductions were made possible by new technologies in food production, in particular for prepackaged and/or prepared food. People have reacted by eating more frequently (snacking), eating bigger portions, spending less time on food preparation and gaining weight.

The question arises how these increases in body weight, causing considerable harm to people's health, are to be evaluated. Do people eat too much? What is the standard for "too much" if people have free choice when and how much they want to eat? Traditional economics advises us to resort to consumer sovereignty under such conditions. "Even with full information about the benefits of physical activity, the nutrient content of food, and the health consequences of obesity, some fraction of the population will optimally choose to engage in a lifestyle that leads to weight gain because the costs (in terms of time, money, and opportunity costs) of not doing so are just too high" (Finkelstein et al. 2005, 252). This might apply all the more because health insurances and taxpayers finance a large amount of the monetary costs of obesity.

However, the possibility of individually consuming "too much" food is excluded by assumption in the revealed preference approach.⁵ Yet, in order to uphold this view, one would have to reconcile the prevalence of obesity with other behavioral regularities, like people spending large sums of money on diets and health clubs, or people's weight yo-yoing as they go from one diet to the next.

An alternative approach accepts that people might face self-control problems when exposed to the temptation of immediate gratification from food when they are hungry or have a craving for something sweet, fatty or salty.⁶ Evidence on subjective well-being can contribute to a broader understanding of obesity as it provides information about people's evaluation of their situation *after* they have decided about their food and beverage consumption. If technical "progress" in producing fatty food is indeed a major driving force behind obesity, the standard economic model predicts that individuals will become heavier and happier. However, if

⁵ Other lines of argument within revealed preference emphasize the variation in individual discount rates for outcomes in the future as an explanation for increased obesity (e.g. Komlos et al. 2004; Borghans and Gosteyn 2005).

⁶ The self-control issue is explicitly addressed in Cutler et al. (2003), whereby its relevance in the assessment of consumers' welfare is discounted because it would require only some exercise on the part of overweight people to balance their energy household. Observed inactivity thus seems to indicate that overweight people do not suffer from their body mass. However, the trade-off is calculated, assuming that people have self-control problems with eating, but not with taking physical exercise. This does not fit our casual observations.

individuals have self-control problems, we would expect them to become heavier and less happy.

In a first step, it can be studied whether obese people are less satisfied. According to an empirical investigation for roughly 8,000 young women, obesity is related to lower satisfaction with work, family relationships, partner relationship and social activities (but not satisfaction with friendships) (Ball et al. 2004). Other studies report correlations between obesity and symptoms of depression, whereby the risk of depression is higher for obese women than obese men (e.g. McElroy et al. 2004; Needham and Crosnoe 2005). These findings, however, provide only limited insights, as the correlations can be due to third variables affecting both eating behavior and subjective well-being, or because low life satisfaction and stress can lead to obesity. The latter has been studied in a longitudinal analysis for 5,867 pairs of twins (Korkeila et al. 1998). It is found that a high level of stress, as well as a low level of life satisfaction are both predictors of weight gain over six years and for certain groups of people over 15 years of age. Another panel study addresses the reverse relationship. Taking baseline mental health into account, it analyzes the long term consequences of obesity, finding an increased risk for depression (Roberts et al. 2002). These results are valuable to assess the relevance of the phenomenon, but they have to be supplemented with further evidence to identify the contribution of self-control problems to the link between obesity and subjective well-being.

Alternatively, it is possible to characterize conditions where attempts to recapture self-control are encouraged. It is to be expected that those people who stand to lose a lot from being obese, or who have access to resources, are more successful in controlling their behavior. For example, obese women seem to suffer a salary and promotion penalty (see the references in Finkelstein et al. 2005). They have strong incentives to control their body weight and might suffer the most when their lack of will power leads to failure. Consistent with this point of view, people in the top income quintile, or in professions with a low prevalence of obesity, report the largest well-being costs of obesity (Felton and Graham 2005).

There are two related open questions with these approaches. The first is regarding the nature of limited self-control. People are exposed to many opportunities, with low immediate marginal costs, but high marginal benefits. The question arises whether people with a self-control problem make myopic decisions when faced with all, or most, of these opportunities. Or whether they can control some challenges to self-control, but find it too difficult to control all of them. The latter view fits in with the idea that there is a limited capacity for self-

regulation. Resisting one temptation may result in poorer regulation of a concurrent desire for immediate gratification or vice versa (Muraven et al. 1998).⁷ This mechanism might be relevant in understanding the interplay between obesity and smoking (Gruber and Frakes 2005).

The second, closely related question is whether reduced will power as such, rather than its consequences, is responsible for lower well-being. People who experience self-control problems might suffer reduced self-esteem, and thus lower subjective well-being. Related empirical evidence is found in a community sample of 2,000 adults (Greeno et al. 1998). In addition to a higher BMI, also the lack of perceived eating control was associated with lower satisfaction with life. For men, it was only the lack of eating control that was correlated with reported subjective well-being.

D. TV viewing

The rational consumer spends the optimal amount of time watching TV. This time seems to constitute a substantial amount of people's leisure time. In many countries, the overall population watches as many hours of TV as it devotes to paid work (Corneo 2005). The largest number of heavy TV viewers⁸ in Europe is found in Greece. As much as 36.8 percent of the population (age 15 and older) reports that they spend 3 hours a day or more watching TV. At the other end of the ranking, there are 8.4 percent heavy TV viewers in Switzerland (see figure 2). In contrast to the rational choice point of view, the same extent of TV viewing might also be observed when viewers have difficulty switching off their TV set and would have preferred to watch less TV if asked *ex post*, and some of them even *ex ante*. The two views lead to systematically different evaluations of the large expansion of cable TV in the 90s. The standard economic model predicts an increase in individual well-being with more TV viewing. In contrast, a model based on individuals with self-control problems predicts more TV viewing but reduced happiness.

⁷ People's ability to self-regulate in a certain domain may not only depend on the effort they invest in other domains, but also on effort invested in the successful performance of tasks in daily work and family life (if they involve self-regulatory exertion of effort). This line of argument might be pursued to explore the relation between increased demands on women at home and on the job on the one hand and female obesity on the other hand.

⁸ By "heavy TV viewers", we mean people who spend a great deal of time watching TV, and not TV viewers who are overweight (although watching a lot of TV is sedentary and invites people to snack, which can in turn lead to obesity).

The reason why TV may lend itself to over-consumption is mainly due to the immediate benefits and the negligible immediate marginal cost of engaging in this activity. One just has to push a button. In contrast to going to the cinema, the theater or any outdoor activity, there is no need to be appropriately dressed before leaving the house, and there is no need to buy a ticket or to reserve a seat in advance. Watching TV does not require any special physical or cognitive abilities (Kubey and Csikszentmihalyi 1990: 173). Unlike other leisure activities, TV viewing does not need to be coordinated with other persons. It is quite possible to sit alone in front of the TV, while other leisure activities, such as tennis or golf, require a partner with similar time availability and similar preferences. As a consequence, watching TV has, compared to other leisure activities, an exceedingly low or nonexistent entry barrier. At the same time, it offers entertainment value and is considered to be one of the best ways of reducing stress. Moreover, while watching TV, immediate marginal costs are even lower and having a remote control is an invitation to ultra short-term optimization (zapping). Many of the costs resulting from such consumption behavior are not experienced immediately, or not predicted at all. The negative effects of not enough sleep, for example, only arise the next day, and the consequences of underinvestment in social contacts, education or career take much longer to appear. An increase in one's material aspirations, due to the rich famous and beautiful being overrepresented on the screen, might not be foreseen at all. These characteristics of the consumption good induce many individuals to fall prey to excessive TV viewing.⁹

Here, the role of self-control problems in TV viewing is addressed with regard to consumers' utility. It is hypothesized that, for people facing similar restrictions, heavy TV viewing indicates impeded self-control rather than a love of TV. Accordingly, heavy TV consumption is expected to result in lower utility. In addition, similar to the argument on smoking in section II.B, an increase in the price of TV viewing would be expected to increase the well-being of TV viewers with a self-control problem.

For most consumers, the price of viewing an additional hour of TV, however, is zero. It is thus not easy to pursue the approach proposed by Gruber and Mullainathan (2005) to test the rational consumer hypothesis (at least as long as pay per view is not more common). An interesting alternative might be the extreme case of no TV. While it is definitely not optimal,

⁹ Regarding television consumption, there is some (anecdotal) evidence that individuals may have self-control problems. 40% of US adults and 70% of US teenagers admit that they watch too much TV (Kubey and Csikszentmihalyi 2002).

it might be compared to unrestrained consumption. The introduction of TV would represent a situation for a possible comparison. However, in most countries, this technological innovation gained ground too early in the last century in order to be able to match it with data on reported subjective well-being.

There are, however, some natural experiments about access to TV that provide some insights as to the consequences of TV for factors that are closely related to individual well-being. A certain Canadian city was unable to receive any TV signals up until 1973, due to its location in a steep valley. Otherwise, it was similar to two cities in the vicinity used as control cases. A study by Williams (1986) suggests that the introduction of TV crowded out other activities, in particular those outside the home, such as taking part in sports' activities or attending clubs. It also reduced the reading abilities and creative thinking of children and fostered more aggressive behavior and stereotyped ideas about gender roles. TV also reduced the problem solving capacities of adults. Another study by Hennigan et al. (1982), based on a natural experiment, takes a look at the advent of TV in the United States which, due to technical reasons, took place at different times in different places. Petty crime, but not violent crime, increased. Observing the same time period in the US, Gentzkow (2004) finds that the advent of TV reduced voter turnout.

So far, we are therefore restricted to study the subjective well-being of heavy TV viewers, controlling for many individual characteristics. Such an approach is followed in a large study on TV viewing and life satisfaction for 22 European countries in 2002/03 (Frey et al. 2005). It is found that the more people spend time watching TV, the lower is their reported satisfaction with life, *ceteris paribus*. The result of the econometric analysis is consistent with the hypothesis that heavy TV viewers suffer significant reductions in their utility because they are unable to fully control their TV consumption: They watch too much according to their own evaluation.

Where do the costs of the misallocation of time come from? There are lost alternatives in the present, like engaging in more stimulating activities or socializing. It is, for example, found that people watching a lot of TV spend less time with family and friends and invest less in relational goods in general (Bruni and Stanca 2005b). But there are also costs in the future. One might be tired the next morning because of not getting enough sleep. Seen long-term, people might change their beliefs about the world and about the sources of well-being. In particular, the exposure to the healthy, wealthy and good-looking people on TV is expected to increase people's aspirations with regard to their own body, but also with regard to their

consumption standard. There is substantial research on the relationship between TV viewing and materialism (e.g. Kasser 2002) and financial satisfaction (Bruni and Stanca 2005a; Layard 2005). Most studies find a positive correlation between extensive TV consumption and those outcomes that are related to lower subjective well-being. In the study for 22 European countries mentioned above (Frey et al. 2005), half of the correlation between TV consumption and life satisfaction can be attributed to heavy TV viewers having lower financial satisfaction, attributing more importance to being rich, feeling less safe, trusting other people less and thinking that they are involved less in social activities than their peers.¹⁰ Because these costs are not experienced immediately, individuals with time inconsistent preferences are unable to adhere to the amount of TV viewing they planned or which, in retrospect, they would consider optimal for themselves. This tendency is aggravated when people mispredict future costs because they underestimate utility from socializing and neglect changes in preference due to TV consumption.

III. The Misprediction of Utility or Overvalued Choice Options

Standard economics assumes that people can successfully predict future utility. At least no systematic deviations are expected. If there were any, individuals would correct them in the long run by learning. Scitovsky (1976) 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). In many careful experiments and surveys, psychologists have studied people’s success in forecasting utility which they were about to experience (for reviews, see Loewenstein, George and Schkade 1999; Wilson and Gilbert 2003). 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. For instance, they overestimate the impact of specific life events on their experienced well-being with regard to intensity, as well as with regard to duration.

The standard economic model of consumer decisions is probably appropriate for most goods and activities and for most situations. It is also appropriate when individuals make random prediction errors. There are, however, situations in which people have to do a trade off and decide between different activities, goods or options, which systematically differ in the extent to which their future utility can be correctly predicted. There are options or attributes of

¹⁰ While these correlations are suggestive, it has to be kept in mind that third factors could be driving differences in the different attitudes as well as in TV viewing.

options that are more salient than others when making a decision and are thus relatively overvalued. If people choose options according to this evaluation, their experienced utility is lower than what they expected and lower than what they could have experienced if they would not have mispredicted their utility. Moreover, they consume different goods with different attributes and pursue different activities than in a situation where no option in the choice set would have special salience.

A. Why are some options overvalued?

We see four major sources for systematic over- and undervaluation of choice options. For all of them, we derive predictions with regard to the actual goods and activities that receive too much or too little emphasis when people make decisions.

Adaptation is underestimated. Research on affective forecasting shows that people overestimate their reactions to specific events because they are embedded within other daily life events that they are not currently aware of: for instance, seeing one's favorite soccer team winning is experienced simultaneously with other events occurring in the environment. Another example of errors in predicting emotions is that people underestimate their ability to successfully cope with negative events. Young academics might be particularly worried about life after a negative tenure decision. Gilbert et al. (1998) asked assistant professors to predict how happy they would be after a positive and a negative tenure decision. The answers were compared with the reported subjective well-being of academics affected by a tenure decision made five or less years previously. Although assistants predicted they would be less happy during the first five years after being turned down, there was no statistically significant difference between those who had and had not gotten tenure. Similarly, assistants also overestimated the positive impact of receiving tenure on their subjective well-being. The general insight is that people usually have biased expectations about the intensity and duration of emotions, in the sense that the emotional impact is often lower than predicted because people adapt more than they foresee. Options are thus overvalued to the extent that adaptation is neglected. Overvaluation of an opportunity is at a maximum if full adaptation occurs but adaptation is neglected. In contrast, overvaluation is at a minimum or nil if there is no adaptation or adaptation is perfectly foreseen. Due to people's tendency to neglect adaptation, misprediction is, in general, at a maximum for options providing stimuli that fade away when repeatedly experienced. While there is considerable evidence for adaptation (for a survey, see Frederick and Loewenstein 1999), there is no systematic understanding of the extent to which people can adapt to different stimuli and the extent to which they can foresee it. The emerging

picture suggests, however, that adaptation is more likely to be underestimated for goods and options serving extrinsic material desires than for those satisfying intrinsic and social needs (see the following sub-section).

Distorted memory of past experiences. When individuals make decisions about future consumption or allocation of time in the absence of information about current experience, they have to resort to their respective experiences in the past. People reflect on specific moments from the past or access generalizations about likely emotions in a particular type of situation (for a discussion, see Robinson and Clore 2002). The specific information that is available has priority in people's judgment. Thereby, the more memorable moments of an experience disproportionately affect retrospective assessments of feelings (Kahneman 1999). What counts as "more memorable" tends to be the most intense moment (peak) and the most recent moment (end) of an emotional incident. This peak-end rule or duration neglect has been established in many experimental tests (Kahneman 2003). Accordingly, there is the potential for systematic misprediction if people base their judgments on retrospection. Goods and activities related to short-term experiences, in particular peak emotions, are overvalued relative to those providing long-term experiences of moderate but enduring positive feelings.

Rationalization of decisions. Individuals have a strong urge to justify their decisions, both to themselves and to other persons (for pre-decision justification, see Shafir et al. 1993). It is not only predicted consumption utility that, for example, affects the decision to buy something, but also whether people think that they are getting a bargain (Thaler 1999). There is a general tendency to resist affective influences and to take rationalistic attributes into account when making decisions. Hsee et al. (2003) call this reason-based choice "lay rationalism". In experiments, they find, for example, that people focus their decisions on absolute economic payoffs and play down non-economic concerns. Other experiments find that people emphasize aspects of events that are easy to articulate and neglect aspects that are important for experience when they are asked to give reasons during the phase of decision-making (e.g. Wilson and Schooler 1991). Similarly, people seem to base their choices on rules and principles and bypass predictions on the experiential consequences of their choices (e.g. Prelec and Herrnstein 1991). These arguments imply, however, that people do not optimally consider various attributes of different options so that utility would be maximized. In sum, choice options for which it is easy to provide rationalistic justifications are overvalued relative to options that lack a handy rationale.

Intuitive theories about the sources of future utility. So far, the reasons for misprediction link the systematic overvaluation of some goods relative to others to the characteristics of these goods with regard to adaptation, memorability and rationalization. In addition, there is a reason for misprediction that builds directly on people's beliefs. People have very diverse intuitive theories about what makes them happy (for a discussion see Loewenstein, George and Schkade 1999). These beliefs have a direct influence on people predicting future utility and it can cause them to overvalue some options compared to others. Moreover, these beliefs play a role, because they shape the reconstruction of past emotions and make them consistent with current self-conceptions or beliefs (Ross 1989). Thus, intuitive theories interact with the three previously discussed sources of misprediction. They can accentuate biases in predicting utility that lie in the nature of the goods. However, they can also counteract people's tendency to overvalue some goods relative to others. The fourth source of misprediction is thus the least specified.

An important belief refers to acquisition and possession as central goals on the path to happiness, i.e. to materialism (e.g. Tatzel 2002 for a discussion in economics). It has been empirically studied whether people who pursue this belief are in fact guided correctly and enjoy a higher well-being than those following other beliefs. It is found that people with material life goals report lower self-esteem and life satisfaction than people with non-material life goals (e.g. Sirgy 1998; Kasser 2002). This correlation is probably partly due to confounding unobserved personality traits and reversed causality due to a compensatory reaction of people with low subjective well-being. However, it might also indicate that people who believe intuitively in materialism are prone to mispredict future utility.

Based on the four sources affecting the valuation of choice options when people make decisions, two propositions can be derived:

- 1) Goods and activities with overvalued attributes are *over-consumed* relative to those goods and activities lacking salient attributes when faced with making a decision.
- 2) The systematic distortions in allocation due to utility misprediction *reduce individuals' experienced utility* according to their *own* best interests.

B. Related phenomena

The hypothesis that people systematically mispredict utility when faced with some trade-offs links up to various strands of literature where similar phenomena have been identified.

The aspect of underestimated adaptation to new situations has been neatly introduced in

theoretical models of intertemporal decision-making (Loewenstein, George et al. 2003). Based on their model of projection bias, various phenomena can be modeled, like the misguided purchase of durable goods or consumption profiles with too much consumption early on in life. Misprediction of utility thus provides an alternative to seemingly irrational saving behavior that is usually addressed in a framework of self-control problems.

It has been argued that the “work-life balance” of individuals today is distorted. People are induced to work too much and to disregard other aspects of life. This proposition has been forcefully put forward for the United States, where individuals are said to be “overworked” (Schor 1991). This is consistent with misprediction of utility, whereby it is argued that people overvalue income relative to leisure.

Competing for status involves negative externalities and therefore too much effort is invested in gaining status and acquiring “positional goods” (Frank 1985; 1999). Misprediction of utility magnifies the distortions of competing for status in consumption if utility from consumption is overvalued.

Mispredicting utility might also explain people’s behavior in court. It has been empirically shown (Tyler et al. 1999) that, when it comes to making decisions, individuals tend to prefer institutions promising favorable outcomes. But *ex post* they state that they would have preferred an institution putting more emphasis on (just) procedures. This finding suggests that people tend to overvalue outcome relative to procedural utility. Procedural utility is the satisfaction derived from the process itself rather than from its outcome (see the survey by Frey et al. 2004).

There is a long tradition in economics arguing that individuals tend to focus too much on material goods and disregard goods providing non-material benefits (see Lane 1991; Lebergott 1993). Most importantly, Scitovsky (1976) claimed that “comfort goods” are overconsumed compared to goods providing “stimulation”. The former are described as defensive activities, providing protection from negative affect. They consist of the consumer goods achieved through rapid productivity growth. In contrast, stimulation comes from creative activities providing novelty, surprise, variety and complexity. These aspects emphasize the renewal of pleasurable experiences. According to Scitovsky, stimulation is at a competitive disadvantage relative to comfort goods because there is a higher cost of access to them and consumers are myopic about the future benefits from stimulating activities. The argument about systematic errors in consumption, however, also fits in with a framework of mispredicting utility.

C. Empirical approaches and findings

The misprediction of future utility can be related to macro phenomena like over-consumption, outcome orientation (relative to procedural considerations), and over-working. However, whether misprediction of utility is involved in these phenomena is very difficult to assess from observed behavior alone. How can we judge whether the costs of running a big car are due to an overvaluation of the pleasure from driving a vehicle that will not even fit on most parking lots?

We propose to study data on reported subjective well-being in order to better understand consumers' behavior and difficulties in decision-making. So far, empirical research on people mispredicting utility is very scattered. While there is evidence for mistakes in affective forecasting, we are not aware of any evaluation on whether there are systematic differences in over- and undervaluation of some goods and activities. We briefly describe some research designs and report some results that provide initial insights.

First, people's difficulties in predicting the intensity and duration of emotions is well documented in research on affective forecasting (see, e.g., Loewenstein and Adler 1995; Wilson and Gilbert 2003). Standard research designs are prospective longitudinal studies about self-reported emotions. People are asked how happy they expect themselves to be after some event has happened or some option has been chosen. These predictions are then compared with reported subjective well-being when actually experiencing the new situation. There are several limits to this design: (i) Usually only predictions for changes in the near future are assessed. (ii) The way in which scales of measurement are interpreted can change, for example, over time, due to maturation or a change in the anchor. (iii) Predictions might also affect actual feelings or even become self-fulfilling prophecies. Some of these problems can be eliminated by conducting studies between subjects, where one group's predictions are contrasted with a different group's actual reports (see, for example, the study on tenure in academics mentioned above).

A second approach is based on individual welfare functions, a concept developed by van Praag (1968). A cardinal relationship between income and welfare is established by asking individuals to add income intervals to a number of verbally described income levels.¹¹ When

¹¹ 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, 367).

answering this ‘income evaluation question’, respondents should take into account their own situation with respect to family and job. Up to nine verbal descriptions ranging from ‘excellent’ to ‘very bad’ are grouped along an interval scale between 0 and 1. The bounded scale reflects that the individual welfare function measures relative welfare as perceived only by the individual. Each individual evaluates his/her income by comparing it with the worst possible position and a position of complete satiation. Thus, the translation of the verbal qualifications results in a sequence of points $(y_i, U(y_i))$ for each respondent, where y_i is the income level and $U(y_i)$ is the number in the $[0,1]$ -interval. It can be shown (van Praag 1968) that the individual evaluations of income $U(y)$ correspond closely to a log normal distribution function

$$U(y) = \frac{1}{\sqrt{2\pi}} \cdot \frac{1}{t} \exp\left(-\frac{1}{2} \frac{(\ln(t) - \mu)^2}{\sigma^2}\right)$$

$$= L(y; \mu, \sigma^2) = N[\ln(y); \mu, \sigma^2]$$

with $L(y; \mu, \sigma^2)$ the lognormal distribution function with parameters μ and σ^2 and $N[\ln(y); \mu, \sigma^2]$ the normal distribution function with average μ and variance σ^2 . For each individual, the parameters can be econometrically estimated. The psychological interpretation of μ and σ^2 is as follows: $\exp(\mu)$ is the median value of the lognormal distribution, i.e. fixes the income level corresponding to an evaluation of 0.5. For a high ‘want parameter’ μ , and therefore $\exp(\mu)$, an individual requires a high income to reach a welfare evaluation of 0.5. σ^2 reflects the ‘welfare sensitivity’; it determines the slope of the individual welfare function around the median value $\exp(\mu)$. An individual with a high σ^2 evaluates a broad range of incomes differently from zero and one and thus does not react sensitively to ex ante income changes.

Individual welfare functions have been estimated for several countries, with good results, particularly for the Netherlands and Belgium (see e.g. van Herwaarden et al. 1977). A particularly interesting aspect is the connection established between the ‘want parameter’ μ and income y , $\mu = \mu_0 + \mu_1 \ln(y)$, which measures the ‘preference drift’ due to a change in income. A positive coefficient for income ($\mu_1 > 0$) suggests that the ex post evaluation of a higher income is smaller than its ex ante evaluation. In other words, rich people, for example evaluate a higher income as being just “sufficient” than poor people. Empirical estimates for the Netherlands and Belgium yield a positive value for μ_1 . Its magnitude of between 0.55 and

0.65 suggests that more than half of an *ex ante* expected welfare increase of higher income evaporates when higher income is reached. This can be interpreted as adaptation to a higher income standard that is *not* anticipated.

In a study for Switzerland, the framework is extended and linked to reported life satisfaction (Stutzer 2004). Individuals' income evaluations are used as a proxy for income aspirations. It is found that the positive effect of a higher income level of a particular percentage on life satisfaction is entirely offset if income aspirations are of the same higher magnitude. Thus, it is the discrepancy between income and income aspirations that is correlated with individuals' reported subjective well-being. The positive effects of higher income are overestimated, as found in the study mentioned above. Income rated as sufficient (as a proxy for income aspirations) increases, *ceteris paribus*, by 4.2 percent for a 10 percent increase in income.

Third, in order to get an idea of any systematic asymmetries in adaptation, the findings for income (or consumption) can be compared to goods and activities that are often involved when people make trade offs that involve a higher material standard of living. It has been found that individuals do not adapt their utility evaluation in the case of undesirable experiences that inhibit intrinsic need satisfaction. In particular, severe health problems, like chronic illness, or illness that gets progressively worse, reduces autonomy and leads to lasting reductions in reported subjective well-being (e.g. Easterlin 2005). Widowers suffer, on average, for years from their lot (e.g. Stroebe et al. 1993). Having a job is related to many aspects that provide flow experiences and satisfy intrinsic needs, like being in the company of workmates, applying expertise and experiencing autonomy. Accordingly, being unemployed is repeatedly found to have high negative non-pecuniary effects on people's subjective well-being, with little habituation (Clark 2002). By way of contrast, having a job with a high degree of autonomy, as in the case of self-employed people, is related to high job satisfaction. Frey and Benz (2003), for example, show that the self-employed derive more utility from their work than people employed by an organization, if controlled for income earned or hours worked. Moreover, they can explain this difference with people's evaluation of the use of initiative at their work place and their satisfaction with the actual work itself (p. 25). Intrinsic attributes also characterize the work of volunteers. In fact, it is found that people doing volunteer work are more satisfied with their life in general, even when taking the possibility of reverse causality into account (Meier and Stutzer 2004).

Fourth, a comprehensive approach is proposed in Frey and Stutzer (2004) for a set of individual choices that all involve a trade off with commuting. In an empirical test of people

mispredicting utility, people's decision to commute for longer or shorter hours is analyzed. The commuting decision involves the trade-off between the salary or the quality of housing on the one hand and commuting time on the other hand. Rational utility maximizers only commute when they are compensated. However, when people overestimate utility from goods serving extrinsic desires, they are expected to opt for too much commuting and suffer lower utility. It is found that commuting is far from being fully compensated and, on average, people who commute one hour one way would need an additional 40% of their monthly salary to be as satisfied with their life as people who do not commute. There is, however, significant variation between people. Incomplete compensation is much stronger for people with strong extrinsic life goals.

Based on the previous findings, we think that for many people there is a tension when they have to trade off material and non-material or social goods and activities. Misprediction of utility is most likely across these two categories of options. When people make trade-offs, material factors get more attention and are overvalued due to the neglect of adaptation, rationalization and memory biases. There are consequences with regard to behavior - material goods are over-consumed - and with regard to individual well-being - people are less well off than they could be without mispredicting utility.

IV. Concluding Remarks

Standard neoclassical economic theory assumes that individuals do not commit any systematic errors in their consumption decisions, because they know their own preferences best and are able to make the consequent decisions. The main message of this chapter is that it is necessary to go beyond this narrow approach. One should take into account the methodological advances made possible by happiness research. They allow us to empirically test whether individuals do or do not make errors, rather than simply assuming that they do not, as is the case in revealed preference theory. The possibility to proxy utility in a satisfactory way using life satisfaction or happiness enables economists to empirically study the difference between decisions made and the satisfaction produced. We see a large potential in this approach to study many areas of consumption choice, and to refine the initial findings on smoking, eating, TV viewing and commuting.

It should be noted that this analysis is not a normative evaluation from the point of view of a benevolent social planner. Rather, the focus is on the mistakes in consumption that individuals commit according to their own perception, placing people in a less favorable

position in terms of their own utility evaluation.

The systematic errors in consumption identified and discussed for four specific areas are no cause for immediate government intervention. It is very likely that individuals are quite capable of making satisfactory consumption decisions for most of the goods most of the time. Moreover, it is doubtful whether “the government” is able to make better decisions in the interests of the persons concerned (see Frey and Stutzer 2006). Nevertheless, our results raise the question of whether activities, typically subject to excess consumption, should be subsidized by the public, and whether taxes in fact produce the extent of dead weight losses claimed in standard public economics. With regard to subsidies, this applies, in particular, to public TV and commuting, which in many countries are highly subsidized by the government. With regard to taxes, tobacco taxes are a case in point as they may not only serve as a means to generate revenue to finance health care, but may also help to overcome problems of self-control. We think, however, that a more effective way to deal with individual errors in consumption is to help individuals to make more reasoned decisions, enabling them to get a clearer picture of the future utility of particular consumption goods and services. In some cases, a “cooling down period” may be beneficial. In other cases, people could be informed about self-control mechanisms.

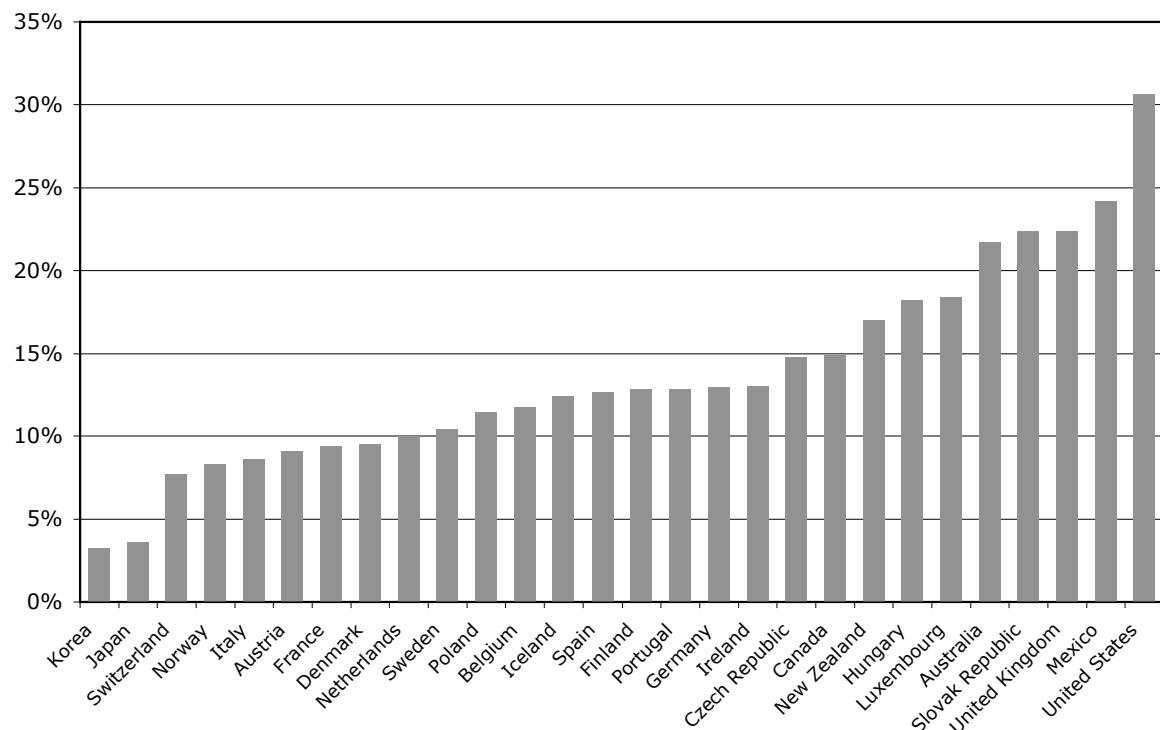


Figure 1. Obesity across countries

Note: Percentage of population aged 15 and over, with a BMI greater than 30 (2003 or latest available year).

Source: OECD Factbook 2005.

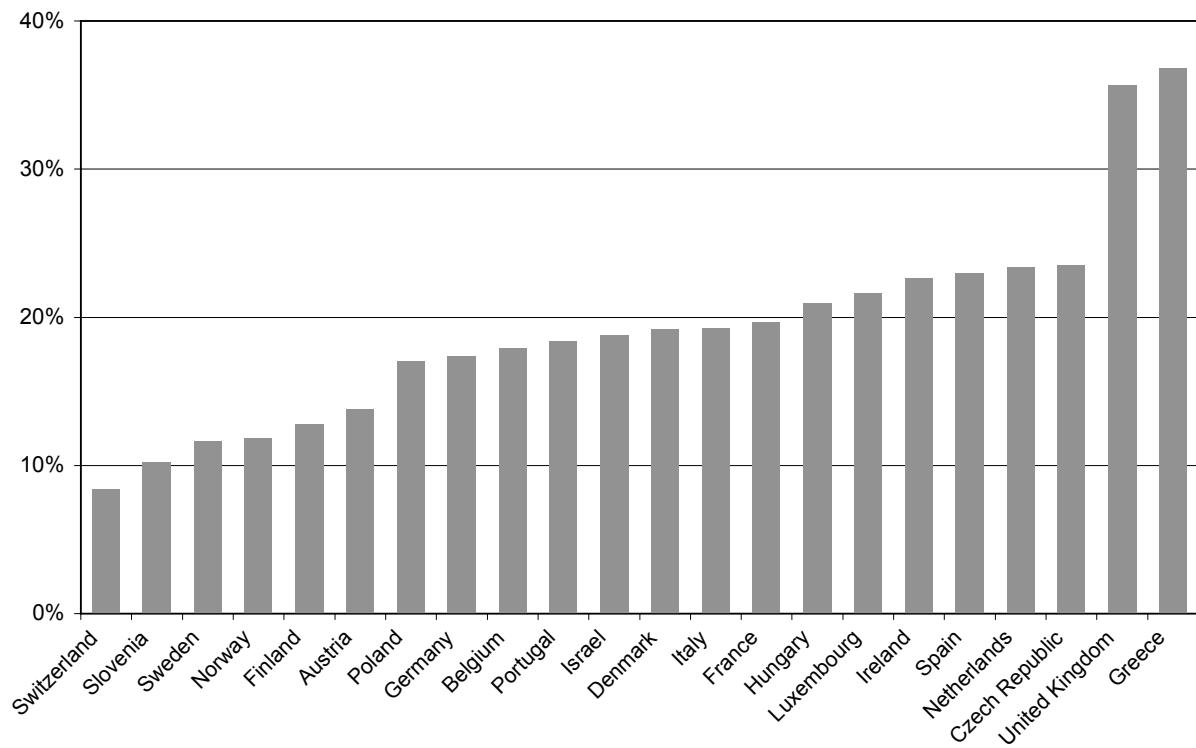


Figure 2. Percentage of heavy TV viewers across Europe

Note: Percentage of population aged 15 and above who spend more than 3 hours watching TV during a normal weekday.

Source: Frey et al. (2005) based on the first wave of the European Social Survey 2002/03.

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