

Some Uses of Happiness Data in Economics

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## Some Uses of Happiness Data in Economics

Rafael Di Tella and Robert MacCulloch

**E**conomists are trained to infer preferences from observed choices; that is, economists typically watch what people do, rather than listening to what people say. Happiness research departs from this tradition. Instead, happiness researchers have been particularly interested in self-reports of well-being, which may be as simple as an answer to a question with the general form: “Are you very happy, pretty happy, or not too happy?” Hundreds of thousands of individuals have been asked this kind of question, in many countries and over many years, and as reviewed in Frey and Stutzer (2002), researchers have begun to use these data to tackle a variety of questions.

Richard Easterlin (1974) was the first economist to make prominent use of happiness data when he reported that despite increases in personal income over time, people were not reporting an increasing level of happiness. This paper begins with a recap of Easterlin’s puzzle and the various attempts that have been offered to resolve it by questioning either the interpretation of the happiness surveys or the underlying economic assumption of what economists should include in utility functions. The paper then discusses other examples of research using happiness surveys: to evaluate whether public policies have positive effects on social welfare, like taxes on cigarettes; to determine the welfare costs of inflation and unemployment; and to investigate determinants of political economy like whether the happiness of Europeans is more affected by inequality than the happiness of Americans.

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## Economic Growth without Happiness?

Most utility functions assume that higher levels of current personal income lead to higher utility. In 1974, Richard Easterlin introduced happiness data into economics and observed that their basic pattern was at odds with this assumption. Specifically, Easterlin (1974) observed that happiness responses are positively correlated with individual income at any point in time: the rich report greater happiness than the poor within the United States in a given year. Yet since World War II in the United States, happiness responses are flat in the face of considerable increases in average income. Figure 1 reports the average happiness response for repeated cross-sections of different Americans between 1975 and 1997 (with the three categorical answers assigned the numbers 1, 2 and 3). Figure 2 presents the cross-section results for the United States in 1994. A similar pattern has been observed in a large number of countries, including France, the United Kingdom, Germany and Japan, and for different periods of time (Easterlin, 1995; Blanchflower and Oswald, 2004). In Japan, income rose by a multiple of five between 1958 and 1987, and happiness remained stationary.<sup>1</sup>

It's true that small upward trends in happiness can be detected in Italy and the Netherlands. Also, sometimes differences in happiness arise depending on which cohort or which ethnic group is followed over time (Blanchflower and Oswald, 2000, 2004). Still, the general finding of growth without significantly greater happiness certainly raises questions about how a person's current income should enter a utility function. A number of possible responses have been offered in attempts to resolve this puzzle. We'll first review a number of explanations for which either the evidence seems weak, or which in the end shed little light on the puzzle that Easterlin (1974) identified: that happiness scores carry no meaning, that happiness scores aren't comparable across people, that people redefine their happiness scores over time, and that happiness should depend on health, the environment, leisure and variables other than income. We'll then consider two explanations for the paradox that have a stronger empirical basis: that happiness is based on relative rather than absolute income and that happiness adapts to changes in the level of income.

### Are Happiness Surveys Related to True Utility?

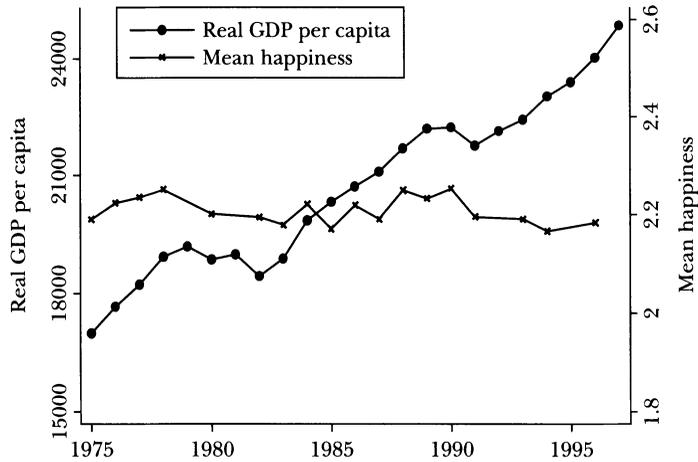
Compared to other subjective data used regularly in some fields of economics, happiness questions have the considerable appeal of requiring only a minimum of information processing.<sup>2</sup> But skeptics may argue that this simplicity is also a weakness because the data may be too simple and thus carry little information. The

<sup>1</sup> For a register of happiness surveys across 112 nations, visit the World Data Base of Happiness: (<http://www1.eur.nl/fsw/happiness/>). See also Veenhoven (1993).

<sup>2</sup> By contrast, for example, "contingent valuation" studies of the costs of environmental damage ask people to place a subjective value on hypothetical events. Problems include the risk of people answering strategically and the possibility that they will answer ignorantly, on the basis of little or misguided information.

Figure 1

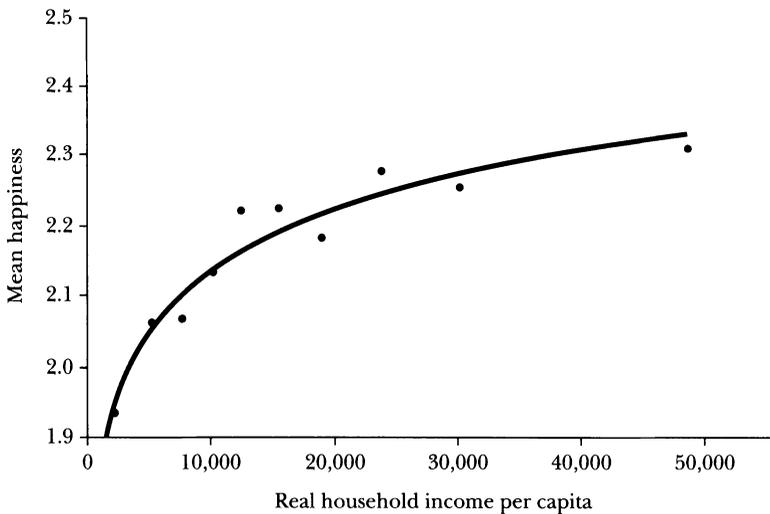
**Mean Happiness and Real GDP Per Capita between 1975 and 1997 for Repeated Cross-Sections of (Different) Americans**



Notes: Right-hand scale is the average of the answers to the question from the United States General Social Survey: “Taken all together, how would you say things are these days—would you say that you are (3) very happy, (2) pretty happy, or (1) not too happy?” Real GDP per capita is measured in 1990 U.S. dollars.

Figure 2

**Mean Happiness and Real Household Income for a Cross-Section of Americans in 1994**



Notes: Left-hand scale is the average of the answers to the question from the United States General Social Survey: “Taken all together, how would you say things are these days—would you say that you are (3) very happy, (2) pretty happy, or (1) not too happy?” The fitted regression line is  $0.13 \ln Y + 0.98$ , from Easterlin (2004b).

skeptical position seems to be: Talk is cheap, and unstructured talk as a result of open-ended questions such as “Are you happy?” is not meaningful. If the scores from happiness questionnaires are not actually related to true utility, then the Easterlin pattern of growth-without-happiness is unsurprising.

A simple test of the hypothesis that happiness data are just noise is to study whether happiness scores correlate with some other variable that we can plausibly claim is associated with true utility. For example, cross-sectional and panel studies reveal that unemployed individuals tend to report low happiness scores (Clark and Oswald, 1994; Winkelmann and Winkelmann, 1998). This outcome seems reasonable given that other “bads” like divorce, addiction, depression and violence are correlated with unemployment. The findings also suggest that happiness surveys are capturing something meaningful about true utility.

Admittedly, it is difficult to discern true utility accurately. In one famous experiment in psychology, Landis (1924) photographed students while they listened to music, looked at pornographic material, smelled ammonia or observed him decapitate a live rat. Third-party observers were unable to predict the activity by looking at the photographs. However, more recent research shows that this inability results from a failure to distinguish between ordinary smiles and the Duchenne smile, a type of smiling that involves a muscle near the eye (called *orbicularis oculi, pars laterali*), which can indeed distinguish between true and feigned enjoyment. Duchenne smiles are correlated with self-reported happiness (Ekman, Friesen and O’Sullivan, 1988; Ekman, Davidson and Friesen, 1990).

Happiness answers (and Duchenne smiles) are also correlated with left frontal brain activity, which in turn appears to be connected to different forms of what we are calling true utility. Fox and Davidson (1982), for example, show that 10-month old infants exhibit greater activation of the left frontal than of the right frontal area of the brain in response to videotapes of an actress generating happy facial expressions. In contrast, asymmetry in other parts of the brain failed to discriminate between the conditions. A good starting point for economists in the psychology literature on happiness is Diener, Suh, Lucas and Smith (1999) and Diener and Seligman (2004).

Ultimately, happiness research takes the view that happiness scores measure true internal utility with some noise, but that the signal-to-noise ratio in the available data is sufficiently high to make empirical research productive. Note that the work discussed in this section also implies that, conceptually, happiness research need not have to rely on subjective data. An example of happiness research involving suicide rates as a proxy for true utility is Stevenson and Wolfers (2003). However, it remains an open question as to whether happiness scores refer to current or delayed utilities.<sup>3</sup>

<sup>3</sup> See also Kimbell and Willis (2005). This could potentially be studied using neuroimaging, as recent work in this area has studied the systems that underlie discounting the value of rewards based on the delay until the time of delivery (McClure, Laibson, Loewenstein and Cohen, 2004).

### Can Happiness Scores be Compared?

Easterlin's (1974) observation of economic growth without increasing happiness involved comparing happiness scores of different people and at different points in time. The interpersonal comparability of happiness scores, however, is a thorny question. How much similarity across peoples' reporting of true utility needs to be assumed in happiness studies?<sup>4</sup>

At one end of the spectrum, the problem of comparing happiness scores between just two individuals remains very difficult. Consider an example with Amanda and Brad, who consume various quantities of good  $x$  on a number of occasions, each time reporting a happiness score. Then imagine that a social scientist decides to estimate a linear regression "happiness equation." The result of the equation is that Brad typically registers a greater increase in happiness scores for each unit consumed than does Amanda. Does this finding mean that if one extra unit of  $x$  falls from the sky then it should be given to Brad? Not really. Perhaps Amanda scores her true utility on a numeric happiness scale using a conversion factor equal to  $1/z$  times the size that Brad uses.

Another way of stating the problem is to say that there may be an unobservable variable we could call "exaggeration" that is missing from the happiness equation. If Brad exaggerates the effect on his utility of increases in  $x$  by more than Amanda does, then his regression coefficient will be biased up relative to hers. This well-known difficulty of comparing utilities is sometimes referred to as the "qualia problem"—Harsanyi (1955) calls it the metaphysical problem—and prevents us from making interpersonal comparisons using self-reported measures.

This problem becomes worse when the happiness scores are at the top of a certain measurement scale, so that they cannot rise higher, or at the bottom of the scale, so that they cannot fall lower. Then, even if Amanda and Brad have the same happiness score—say they both choose the top category—the bounded nature of the scoring method introduces a problem when using scores to make such comparisons. These bounds can also make it appear that marginal utility is diminishing as consumption increases, when in fact the scores are hitting the top of the scale and for that reason becoming less responsive to rising true utility.

However, once the analyst moves beyond comparing just two individuals and instead starts focusing on groups, the problems of comparing happiness are much reduced. After all, the possibility of systematic *differential* reporting biases when two groups containing large numbers of individuals are compared could become small. This is important because a large fraction of the happiness literature in economics is based on comparing average happiness scores for large numbers of people. As one example, consider some data from the German Socio-Economic Panel. These data track happiness scores for the same people over time, based on the answer to

<sup>4</sup> See also Ng (1996) and Tinbergen (1991), as well as the early work advocating the use of data on individual satisfaction with the level of income by van Praag and Kapteyn (1973). A related issue is that it remains arguable whether an arithmetic mean of individual utilities is a useful indicator of social welfare. See Harsanyi (1955).

the question: “In conclusion, we would like to ask you about your satisfaction with your life in general, please answer according to the following scale: 0 means completely dissatisfied and 10 means completely satisfied: How satisfied are you with your life, all things considered?” The scale on which the answers are recorded shows “0, 1, 2, . . . , 9, 10.” The survey tracks approximately 14,000 individual Germans over time, for a period of up to 16 years.

To illustrate the most problematic case, consider the first two columns in Table 1, which present the results of two ordinary least squares regressions, using the poorest and richest halves of the sample, where the dependent variable is the happiness score and the independent variables are the level of income and individual fixed effects. There are obviously many ways to tweak this estimation.<sup>5</sup> But the point is that the poor half of the sample in column 1 seems to make more pleasant noises, which we call happiness data, when they have more income. (A t-test of equality of the two income coefficients is rejected at conventional levels. Note that the shape of Figure 2 shows that the data from the United States in 1994 are broadly consistent with this result.)

The individual fixed effects included in the calculation reduce the chance that unobserved heterogeneity, like ability, exaggeration or family background, is driving our correlations. Kohler, Behrman and Skytthe (2005) address the issue of unobserved heterogeneity across individuals in a different way by using within-monozygotic twin pair estimation with data on identical Danish twins to show that partnerships and children have appreciable persistent effects on happiness.

But problems remain, however, when exaggeration is correlated with income over time for the same individual. For example, people who become richer may become more modest about reporting how much happier they are becoming. Thus, a politician wishing to achieve the highest average happiness and who is faced with the problem of how to distribute a windfall of one euro has only a partial use for these results. For example, the politician might take the position that the burden of proof is on the rich, who should have to make the case that they are obtaining at least 15 times more true utility from the extra euro than their happiness scores are indicating, or else the euro should go to the poor ( $15 = 0.12/0.008$ ).

As another application based on these data, consider the case of a politician who has to decide which part of Germany will enjoy a shock (such as a beneficial investment project) that decreases the unemployment rate. In this case, the data are divided by region, rather than by rich and poor. Thus, the regressions in the third and fourth columns of Table 1 continue to have happiness scores as the dependent variable, but the data are now aggregated at the state level (Germany has a federal system of government in which the country is divided into semi-

<sup>5</sup> For example, there may be convincing ways of obtaining exogenous measures of income, or one may want to employ a more flexible cardinalization of the data. One approach is to use ordered probits with different cut points for each group in the sample, as in Di Tella and MacCulloch (1998); see also the approach in van Praag and Ferrer-i-Carbonell (2004).

**Table 1**  
**How Happiness Scores Vary with Personal Income, Germany, 1985–2000**

|                              | <i>Poor</i>    | <i>Rich</i>      | <i>Region 1</i> | <i>Region 2</i> |
|------------------------------|----------------|------------------|-----------------|-----------------|
| <i>Real income</i>           | 0.12<br>(0.02) | 0.008<br>(0.007) | 0.09<br>(0.07)  | 0.11<br>(0.08)  |
| <i>Unemployment rate</i>     |                |                  | -.04<br>(0.02)  | -0.03<br>(0.01) |
| <i>Dummy variables</i>       | Individual     | Individual       | State           | State           |
| <i>Overall R<sup>2</sup></i> | 0.01           | 0.003            | 0.48            | 0.02            |
| <i>No. of observations</i>   | 8,355          | 8,370            | 75              | 75              |
| <i>No. of groups</i>         | 1,392          | 1,305            | 5               | 5               |

*Source:* Data are from the German Socio-Economic Panel (GSOEP), which randomly samples households living in the Federal Republic of Germany.

*Notes:* The dependent variable is the answer to the question: “In conclusion, we would like to ask you about your satisfaction with your life in general, please answer according to the following scale, 0 means completely dissatisfied and 10 means completely satisfied: How satisfied are you with your life, all things considered?” The answers range on a scale from 0, completely dissatisfied, to 10, completely satisfied.

The method used is an ordinary least squares regression, with standard errors in parentheses. *Real income* is the individual’s income measured in thousands of 1995 Deutschmarks. In columns 3 and 4, it is averaged at the state-year level. *Unemployment rate* is the state’s unemployment rate. *Poor* is the bottom half of the sample of employed females (average income 40,938 DM). *Rich* is the top half of the sample of employed females (average income 84,864 DM).

*Region 1* consists of Schleswig-Holstein, Lower Saxony, Bremen, Rhineland-Pfalz and Baden Wurttemberg. *Region 2* consists of Berlin, Hessen, North Rhine-Westphalia, Hamburg and Bavaria.

autonomous states, similar to the United States). The variables assumed to be independent are income and the unemployment rate, and these variables are measured at the state level, too. The data include 15 years and ten German states. This case is simpler because there is no a priori reason to believe that large numbers of people living within each of these states in this time period should be scoring themselves systematically differently in a way that interferes with the interpretation of the coefficient on the unemployment rate. The coefficients on this variable for both regions of the country presented in the third and fourth columns are negative and significant. Since equality of the coefficients across the regions cannot be rejected, the politician has some basis for deciding to have both regions of Germany share equally in the shock that will reduce unemployment.

The kinds of comparisons suggested in this section are admittedly nonstandard. As Hammond (1991) puts it: “Following [Lionel] Robbins, it became fashionable for economists to eschew interpersonal comparisons of utility, apparently in an attempt to be *scientific*.” He also states: “And where interpersonal comparisons really have to be made, because the gainers from a change were not going to compensate the losers, the monetary comparisons that result from valuing all individuals’ dollars equally still seem to be the most popular among economists, who then wonder why their policy advice does not receive wider acceptance.” The underlying assumption of a large part of happiness research in economics is that when people

are measured in groups, the combination of their happiness scores does reveal useful information with which to make comparisons about social welfare.

### **Are People Redefining What Their Happiness Score Means?**

The happiness data typically available for the United States have only three response categories. Starting in 1972, the General Social Survey carried out by the National Opinion Research Center has asked: “Taken all together, how would you say things are these days—would you say that you are very happy, pretty happy, or not too happy?” Before that, surveys going back to the 1940s done by the American Institute for Public Opinion and the Gallup poll asked a similar three-part happiness question, with minor differences in wording. Perhaps with only three categories to choose from, Americans re-adjust their interpretation of the happiness scale so that they tend to fall somewhere in the middle.

However, the Easterlin (1974) puzzle is also present in the German Socio-Economic Panel used in Table 1, which has happiness data on a scale from 0 to 10 and records the answers of the same people over time. Figure 3 below plots average happiness and average real incomes for 8,649 West Germans aged from 21 to 65 years old who were followed between 1985 and 2000. The period is relatively short compared to life expectancy in Germany at the time, so it seems unlikely that a sweepingly different cultural notion of happiness has come into play. If we draw best-fit regression lines to approximate the two trends, the slope is significantly positive for the income series and significantly negative (although not large in magnitude) for the happiness series (both at the 5 percent level).

Luttmer (2004) has also worried about the possibility that what people mean by “happiness” might shift over time. He uses measures of well-being like the incidence of depression, poor appetite and poor sleep that are less likely to be purely subjective and finds similar results as those obtained using standard subjective happiness data.

Although the evidence is not conclusive, there seems little reason to believe that the average person in the present is substantially happier than the average person several decades ago, but is just answering the happiness questionnaires in a similar way.

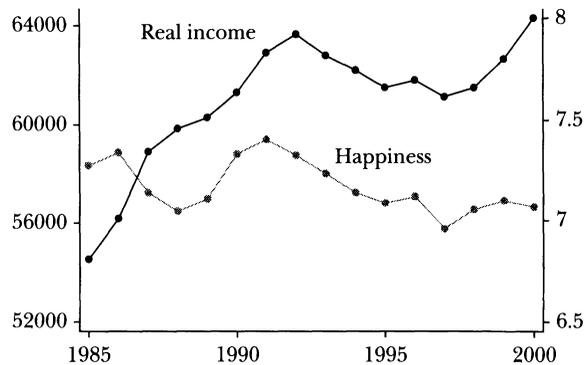
### **Expanding the Concept of Social Welfare**

Another possible alternative is to study the role of omitted variables. Maybe you can’t just throw money at the problem of achieving happiness. If people care about other aspects of their lives, such as their health, the environment, leisure and so on, and if some of these variables are negatively correlated with GDP per capita, then higher GDP might accompany an unchanging level of happiness. This insight is related to the idea, sometimes observed in policy circles, of replacing GDP per capita in favor of broader measures of welfare, such as environmentally adjusted GDP or the Human Development Index from the United Nations Development Program.

The problem with this explanation, however, is that most of the variables that

Figure 3

**Average Happiness and Real Annual Income Per Capita between 1985 and 2000 for the Same Group of 8,649 Individuals Residing in West Germany**



Notes: Right-hand scale is the average of the answers to the question: "In conclusion, we would like to ask you about your satisfaction with your life in general, please answer according to the following scale, 0 means completely dissatisfied and 10 means completely satisfied: How satisfied are you with your life, all things considered?" Real annual income is measured in 1995 Deutschmarks.

economists would think about adding to the utility function have trended in the wrong way to explain why reported happiness levels have been so flat over time. Take leisure, for example. In most OECD countries, hours worked on average have gone down, not up. In France, for example, average annual hours worked per employee went from 1,865 in 1975 to 1,605 in 1997, a drop of almost 14 percent. If people in France cared about leisure and income, happiness reports should have risen even faster. With the exception of the unemployment rate, most candidate variables for inclusion in the utility function, such as health (proxied by life expectancy) and the environment also improved in France over this period. Di Tella and MacCulloch (2003) correlate happiness with a battery of variables (including leisure, crime and the environment) that some could argue belong in the utility function and observe that, given their evolution over time, happiness should have risen even more. Thus, introducing omitted variables doesn't solve the Easterlin paradox; instead, it deepens the puzzle.

### Is Happiness Based on Relative Income?

Easterlin (1974) discussed the hypothesis that people care about their income relative to that of others as an explanation for the growth without happiness phenomenon. This argument is also made in models of interdependent preferences, which trace back at least to Duesenberry (1949) and Pardo (1968) but have also seen a recent resurgence in the work of Frank (1997), Clark and Oswald (1998), Blanchflower and Oswald (2004) and others. Frey and Stutzer (2002) present a good review. As a recent example, Luttmer (2004) studies a panel of almost 9,000 individuals in the United States. He matches individual data on happiness and income with the average earning in the locality in which individuals

live (which contains 150,000 inhabitants on average). He observes that approximately similar decreases in individual happiness are produced when individual income falls as when the locality's income increases and concludes that there are sizeable relative income effects.<sup>6</sup> In addition, the estimated effects appear to be larger amongst individuals who socialize more in the locality, possibly since this makes income differences with others more salient to the individual. (Of course, people may still wish to move to high-income localities to the extent that they offer other amenities that increase happiness.) Similarly, Clark (2003) presents panel evidence on the happiness drop associated with becoming unemployed and finds that the drop in happiness is smaller the higher is the unemployment rate in this person's reference group.

### **Does People's Happiness Adapt to Changed Circumstances?**

The pattern of economic growth without increases in happiness would result also if people become accustomed over time to increases in income, as in the model of Pollak (1970). A classic paper in psychology, Brickman, Coates and Janoff-Bullman (1978) showed that a very small sample of individuals who had won between \$50,000 and \$1,000,000 at the lottery the previous year reported "comparable" life satisfaction levels as those who did not. They also argued that individuals who had become paraplegic or quadriplegic within the previous year reported only slightly lower levels of life satisfaction than healthy individuals. More recently, Easterlin (2004a) has shown that the evidence suggests there is complete adaptation to income but incomplete adaptation to life's events (like marriage or disability). For an insightful review of studies that have evidence on the extent of adaptation, see Frederick and Loewenstein (1999). See also the recent evidence in Oswald and Powdthavee (2005), Riis, Loewenstein, Baron and Jepson (2005) and the discussion in Rayo and Becker (2004).

Consider again the German data from 1985 to 2000 as presented in Figure 3. Although the income time trend is overall positive and the happiness one is overall negative, the year-to-year fluctuations in happiness and incomes show signs of moving together—that is, changes in happiness and changes in real income are positively correlated over the period. Consequently, there appear to be transitory income effects that do not, however, translate into permanently different levels of happiness. Di Tella, MacCulloch and Oswald (2003) present results consistent with adaptation to income over time using country panels. A natural explanation behind adaptation is that people adjust their desires—a phenomenon sometimes called "preference drift" (van Praag and Kapteyn, 1973). In this spirit, van de Stadt, Kapteyn and van de Geer (1985) cannot reject the hypothesis of one-for-one changes in income aspirations and income (see also van Praag and Ferrer-i-Carbonell, 2004), whereas Stutzer (2003) directly measures a negative relationship between happiness and income aspirations.

<sup>6</sup> An alternative approach presented in Charness and Grosskopf (2001) is based on controlled experiments and obtains weaker results.

In brief, the overall evidence is consistent with the hypothesis that an individual's happiness or utility is not just a function of income at a point in time, as in the standard model most often used by economists, but that happiness adapts to changes in income over time, and that at a point in time, happiness also comes from relative levels of income. Note that for both adaptation and relative income effects to be relevant explanations of the Easterlin (1974) paradox we would need a very specific pattern: it would have to be the case that individuals adapt to income, but do not adapt to their relative position. This pattern is consistent with Easterlin (2004a), who argues that family aspirations do not change as marital status and family size change, but that material aspirations increase commensurately with household wealth. This is also the pattern that is present in the panel data analyzed in Di Tella, Haisken-de-New and MacCulloch (2005), who show evidence consistent with strong adaptation to income (within four years) but no adaptation to (job) status.

## Using Happiness Data to Evaluate Policy

To measure how policies affect social welfare, economists have traditionally operated in two steps. First, they look at how policies affect behavior. Then, using these predictions, they connect policies to welfare through some theoretical model. A common problem with this approach is that, even if agreement exists on how a policy affects behavior, there is often a lack of consensus on how the consequences of policy will affect welfare.

For example, will a higher tax on cigarettes increase or reduce the welfare of smokers? A wide range of studies on the behavior of smokers have estimated that their purchases of cigarettes fall when the price rises. However, this behavioral effect is consistent with two models that have opposite welfare implications. In the Becker and Murphy (1988) "rational addiction" model, the welfare of smokers drops as cigarettes, which they enjoy, become more expensive. However, if smokers have self-control problems, then their preferences can be time-inconsistent in the sense of Laibson (1997) so that they always want to quit in the future, but never in the present. A cigarette tax is able to raise the welfare of these types of smokers by providing them with a commitment device that allows them to do something that they would not otherwise choose.

To resolve these ambiguous theoretical predictions, Gruber and Mullainathan (2002) match happiness data on smokers and nonsmokers from the United States and Canada to cigarette tax data from U.S. states and Canadian provinces. They exploit the fact that cigarette tax changes should only affect the happiness of current and former smokers. Since they do not have data on former smokers and smoking data are only available for a subset of years in their surveys, Gruber and Mullainathan compare the effect of cigarette taxes on those who are predicted to smoke with those who are not. Their paper finds that a 50-cent tax per pack of cigarettes would leave predicted smokers with the same level of happiness as those

who are not predicted to smoke in the United States (the actual average real tax equals 31.6 cents per pack in 1999 values). They explain that it seems extremely unlikely that some form of measurement error in the happiness data can be driving their results, since the error would have to change in those states and years where cigarette taxes change and in such a way that it only affects the happiness gap between predicted smokers and nonsmokers. Thus, the evidence from happiness surveys is inconsistent with the “rational addiction” model and favors the “psychological (hyperbolic)” model.<sup>7</sup>

To provide more help to policymakers, researchers will have to be more specific about the distributional details of the proposed policies. Presumably, in the case of the tax on cigarettes even within the group of predicted smokers, the effects will vary depending on the subgroup. For example, although smokers who quit will be happier, those that do not quit will be worse off because of the increase in price (and the frustration from failing to quit with this extra incentive).

A second example where happiness data can help in evaluating policy involves changes in unemployment benefits. Some evidence suggests that the unemployment rate should decrease when unemployment benefits fall. However, there is not much guidance as to what will happen to welfare. Just as in the smoking example discussed above, there are conflicting forces within each group. Those who were unemployed but end up taking jobs as a result of the lower benefits may become better off. However, the overall effect on welfare within the unemployed is ambiguous because those that remain unemployed have their welfare reduced by the cut in benefits, but also have their welfare increased because the average duration of their unemployment spell declines. Similarly the existing pool of employed workers face a mix of consequences: they gain if lower benefits lead to lower taxes and a reduced fear of job loss, but their welfare may drop since the risk of becoming unemployed with a lower level of unemployment benefits now involves a higher personal cost. The net effect of all these consequences is hard to estimate and a lot depends on debatable theoretical arguments.

However, a direct method to estimate at least a part of the consequences is to run a happiness regression for an employed person that includes the level of benefits (to proxy for the cost of risk) and the unemployment rate. In principle, a policymaker could then compare the effects on happiness for workers of losing their safety net with the gains from lower unemployment rates. In work along these lines, Di Tella, MacCulloch and Oswald (2003) show that in Europe, the happiness gap between the employed and the unemployed did not narrow with increases in benefits during the period from 1975 to 1992. Again, since the estimates involve

<sup>7</sup> More generally, an important finding in research in psychology is that people often miscalculate the utility associated with the choices they face (for example, Gilbert, Pinel, Wilson, Blumberg and Wheatley, 1998, 2002; Riis, Loewenstein, Baron and Jepson, 2005). Kahneman, Wakker and Sarin (1998), for example, distinguish between the hedonic experience of an outcome and decision utility (the weight assigned to an outcome in a decision). In this case, inferring preferences through revealed preference may be insufficient, and happiness data may provide a measure of hedonic experience, a point emphasized in Rabin (1998).

differences between two groups of workers within a panel, it seems unlikely that measurement error in the happiness data or omitted variables drive the results. This evidence weighs against the theory that high European unemployment arises because higher unemployment benefits have made life “too easy” for the unemployed. For example, Krugman (1994) observes that most economists share the same diagnosis that in Europe “the relatively generous level of unemployment benefits has made workers unwilling to accept the kinds of low-wage jobs that help keep unemployment comparatively low in the United States.”

Finally, some authors have used happiness data to study other, more permanent institutional features of the economy, such as the role of direct democracy. Frey and Stutzer (2000) exploit the large cross-sectional variation in the institutional rights to political participation across the 26 Swiss cantons. They find that average happiness and an index of direct democracy in a canton are positively correlated. Intriguingly, they also find that the effect is stronger for Swiss nationals relative to foreigners (about three times), which they interpret as suggesting that it is not the policy outcome of direct democracy that matters (from which foreigners cannot be excluded) but rather the process itself that matters (since only the Swiss can participate in referenda).

## **The Inflation-Unemployment Tradeoff**

A large literature in macroeconomics assumes that social welfare is reduced both by a higher rate of inflation and by a higher rate of unemployment. This literature has been subject to both a fundamental critique and a question about magnitudes. The fundamental critique is that nominal aspects of an economy like inflation should be of no consequence to rational people. But even if inflation and unemployment do both enter into people’s happiness, there remains a question of magnitudes: how much unemployment is equal to a percentage point of higher inflation, or vice versa.

Happiness data can address some of the issues in the unemployment-inflation literature. Wolfers (2003) presents a comprehensive set of estimates, using data on the happiness responses of more than half a million people in a maximum of 16 European countries for the period 1973–1998 (for a total of 274 country-years). Table 2 shows his main results from a regression in which people’s happiness data are the dependent variable and the explanatory variables are the unemployment and inflation rates that they are experiencing.<sup>8</sup>

The calculations show that inflation and unemployment both reduce happiness. The method of calculation used here—the ordered probit—takes the raw

<sup>8</sup> Shiller (1997) approached the problem by asking people directly about why they dislike inflation. Interestingly, macroeconomics is also the focus of some of the earliest work we found using a “happiness” approach, namely that by Durkheim (1897 [1951]) on the effect of social changes (including economic crisis) on “anomic” suicides.

Table 2

**How Happiness Scores Vary with Macroeconomic Variables: 16 OECD Countries, 1973–1998**

|   |                  |
|---|------------------|
| Macroeconomic variables                   |                  |
| <i>Unemployment rate</i>                  | –3.45<br>(0.50)  |
| <i>Inflation rate</i>                     | –0.73<br>(0.33)  |
| <i>Personal characteristics included?</i> | Yes              |
| <i>Dummy variables</i>                    | Country and year |
| Unemployment-inflation tradeoff           | 4.7<br>(4.1–5.8) |
| Pseudo R <sup>2</sup>                     | 0.06             |
| No. of observations                       | 504,581          |
| Country-year clusters                     | 274              |

*Source:* Data are from the Euro-barometer survey series (Wolfers, 2003).

*Notes:* The dependent variable is the answer to the question: “On the whole, are you very satisfied, fairly satisfied, not very satisfied or not at all satisfied with the life you lead?” where the individual chooses between a) “very satisfied,” b) “fairly satisfied,” c) “not very satisfied” and d) “not at all satisfied.” The method is an ordered probit regression, with standard errors in parentheses and adjusted for clustering at the country-year level.

happiness scores and transforms them into continuous scores based on the proportions in the sample and assumes a standard normal distribution. One way to obtain a feel for the size of the effects is to focus on a person with a relatively low happiness score, such that she has only 36 percent of the sample below her. An increase in unemployment equal to 10 percentage points would shift the whole distribution in the direction of lower scores (by 0.35 of a standard deviation) so that the median person in the new distribution has the same happiness score as the woman with the 36<sup>th</sup> percentile score in the original distribution. Table 2 also allows a comparison of the happiness costs of unemployment and inflation: specifically, a percentage point of unemployment causes 4.7 times more unhappiness than a percentage point of inflation.

The estimate that a percentage point of unemployment causes more unhappiness than a percentage point of inflation seems robust, although the precise multiple varies in different studies. Di Tella, MacCulloch and Oswald (2001) estimates that an additional percentage point of unemployment causes twice as much of a reduction in happiness as an additional percentage point of inflation in a smaller sample that includes country-specific time trends as controls. They note that the coefficient on the unemployment rate in Table 2 reflects how the *average* person changes their score when unemployment changes. But the average person is employed. Since the happiness regression in Table 2 also includes a control variable for whether each person is unemployed (in the set of personal characteristics) the coefficient on this variable measures the direct cost to those falling unemployed. Therefore, to calculate the total cost of unemployment, the cost to

the average person must be increased by adding the individual cost to the unemployed. Determined this way, all the estimates available of the happiness consequences of unemployment compared with inflation suggest that using a “misery index” with equal weights on inflation and unemployment (as is often done for policy purposes) would underestimate the costs of joblessness.

The coefficients on the unemployment and inflation rates can be useful for policy. Consider a government that thinks it can produce a recession that increases the unemployment rate by 2 percentage points for one year and gets a permanent reduction in inflation of 1 percentage point. Wolfers (2003) points out that, using a discount rate of 6 percent for the happiness effects of inflation, this tradeoff is equivalent to an increase in the unemployment rate of 2 percentage points for one year and a one-year drop in the inflation rate approximately equal to 18 percentage points. Should the government choose this policy? A government that buys the assumptions on which happiness research is based would look at the estimates in Table 2 and say yes. This is because the gain coming from the one-year drop of 18 percentage points in inflation is greater than the loss coming from 4.7 multiplied by the 2 percentage point rise in unemployment. It would be a way to justify Feldstein’s (1997) claim that there is widespread professional consensus on inflation’s adverse effects and that these justify the short-term unemployment sacrifices that are required to reduce inflation to lower levels.<sup>9</sup> Interestingly, Wolfers (2003) also finds evidence that individuals’ happiness scores tend to be lower when the volatility of unemployment and of inflation tend to be high. He then suggests some estimates of the costs of business cycle volatility.

## Political Economy

The potential uses of happiness data in political economy are vast. Such an application of happiness research can begin by studying in detail happiness responses across subsamples of people. For example, consider the literature on the “political business cycle”—that is, the theories that seek to explain business cycles by the actions of political parties to stimulate the economy at election time, even at a long-run cost, and the theories that explain the path of the business cycle by differing political preferences of the parties.

One version of this theory is built around the assumption that the main parties have different preferences over inflation and unemployment. A common approach is to assume that right-wingers care more about inflation (relative to unemployment)

<sup>9</sup> Positive theories of inflation assume that governments choose an inflation rate to maximize social welfare,  $s(u, \pi)$ , where  $u$  is unemployment and  $\pi$  is inflation, subject to a Phillips curve tradeoff, whereby unemployment depends on inflation and inflationary expectations. The government faces a commitment problem, and its choice of inflation depends on the ratio of the marginal welfare effects of inflation and unemployment, which can be estimated from our happiness regression. However, identification problems (as in the Lucas critique) can arise if, for example, real money balances that depend on expectations of future inflation enter the welfare function directly.

than do left-wingers (for example, Hibbs, 1977; Alesina, 1987). Di Tella and MacCulloch (2005) use happiness data to study these assumptions. The general strategy is to separate the sample using information on political self-identification, such as the answer on a scale of 1 to 10 to the question: "In political matters, people talk of 'the left' and 'the right.' How would you place your own views on this scale?" Respondents were classified as being left if their response was in categories 1 to 3 and right if their response was in categories 8 to 10. We then estimate the effect of the inflation and unemployment rates on the happiness of the left and right subsamples separately. A single happiness regression can also be estimated where the coefficients on unemployment and inflation are allowed to vary depending on whether the individual is left- or right-wing. Of course we must proceed with an awareness that people are not randomly selected into different political identifications and may change beliefs depending on their current economic circumstances.

The first two columns in Table 3 illustrate that the unemployment/inflation ratio is indeed higher for left-wingers than for right-wingers.<sup>10</sup> The calculation also demonstrates some strengths of this approach. This regression helps control for other economic shocks that are contemporaneous with the macroeconomic variables in the regression and that affect the average happiness of the members of the two partisan groups by the same amount. These results also show how happiness research imposes a minimum of structure: essentially, people are asked two questions—their happiness and their political orientation. The connection with macroeconomic variables like unemployment or inflation is made later on by the researcher.

Happiness data also provide some basis for inquiring into the origin of these differences. Paul Samuelson once said (as quoted by Hibbs, 1987, p. 213): "The difference between the Democrats and the Republicans is the difference in their constituencies. It's a class difference . . . . The Democrats constitute the people, by and large, who are around the median incomes or below. These are the ones whom the Republicans want to pay the price and burden of fighting inflation. The Democrats are willing to run some inflation (to increase employment); the Republicans are not." However, the results reported in the third and fourth columns, which divide the sample into the "rich," who are in the upper quarter of the income distribution, and the "poor" in the bottom quarter of the income distribution, do not support Samuelson's view. The unemployment/inflation tradeoffs of the rich and the poor are not significantly different. Further tests show that, if anything, the

<sup>10</sup> Similar results obtain if we use the answers to "If an election were to be held tomorrow, which party would you vote for?" and then classify parties into left and right using a standard political scientist's ideological index. Within the United States, there is also other evidence of partisan effects. Alesina, Di Tella and MacCulloch (2004) report that for a sample of 44 states between 1981 and 1996, higher state unemployment rates significantly decrease the happiness of the left, but not the right. "Left" respondents identified themselves as "Strong Democrat," "Not very strong Democrat" or "Independent, close to Democrat" when asked "Generally speaking, do you usually think of yourself as a Republican, Democrat, Independent, or what?" "Right" respondents are those answering "Independent, close to Republican," "Not very strong Republican" or "Strong Republican."

Table 3

**Partisan Social Happiness Functions, Left and Right: 10 OECD Countries, 1975–1992**

|   | <i>Left</i>         | <i>Right</i>        | <i>Poor</i>         | <i>Rich</i>         |
|---|---------------------|---------------------|---------------------|---------------------|
| Macro variables                           |                     |                     |                     |                     |
| <i>Unemployment rate</i>                  | −6.67<br>(2.54)     | −4.96<br>(2.43)     | −5.50<br>(1.66)     | −4.19<br>(1.99)     |
| <i>Inflation rate</i>                     | −1.64<br>(1.35)     | −6.09<br>(1.12)     | −3.80<br>(1.04)     | −2.69<br>(0.99)     |
| <i>Personal characteristics included?</i> | Yes                 | Yes                 | Yes                 | Yes                 |
| <i>Dummy variables</i>                    | Country<br>and year | Country<br>and year | Country<br>and year | Country<br>and year |
| <i>Country specific time trends</i>       | Yes                 | Yes                 | Yes                 | Yes                 |
| Unemployment inflation tradeoff           | 4.1                 | 0.8                 | 1.4                 | 1.5                 |
| Pseudo R <sup>2</sup>                     | 0.08                | 0.09                | 0.07                | 0.09                |
| No. of observations                       | 39,816              | 35,023              | 58,381              | 61,633              |
| Country-year clusters                     | 160                 | 160                 | 160                 | 160                 |

*Source:* Data are from the Euro-barometer survey series (Di Tella and MacCulloch, 2005).

*Notes:* The dependent variable is the answer to the question: “On the whole, are you very satisfied, fairly satisfied, not very satisfied or not at all satisfied with the life you lead?” where the individual chooses among a) “very satisfied,” b) “fairly satisfied,” c) “not very satisfied” and d) “not at all satisfied.” The method is an ordered probit regression, with standard errors in parentheses and adjusted for clustering at the country-year level.

poor tend to report lower levels of well-being than the rich at higher inflation rates. This is a particularly simple test of the hypothesis that inflation hurts the poor (contrast with, for example, the approach in Blinder and Esaki, 1978).

Happiness data also allow for tests that are more political in nature. As an example, Di Tella and MacCulloch (2005) construct a measure, similar to those used by political scientists, of the extent to which the government in a country in a particular year leans toward the right. The measure first counts the share of votes received by each party participating in cabinet and multiplies this percentage of support by a left/right political scale from Castles and Mair (1984). This variable is then included in regressions such as those presented in Table 3. Its coefficient is negative and significant in the regression for the left-winger subsample and is positive and significant in the right-winger subsample. The absolute size of the effect is similar for both groups. This coefficient captures the residual effect of the leanings of the government on partisan happiness of both sides—after controlling for macroeconomic outcomes and individual characteristics. An interpretation is that some people are not as concerned about differences in policies but care mainly about winning (like a soccer fan), or that politics enters directly into the utility function. Interestingly, the left/right position of the government creates no differences across the poor and rich subsamples, again suggesting that the “class” interpretation of differences in political party support or ideology is unlikely to be the full story.

As a final example, we note that happiness data can be used to help explain differences in economic policies between Europe and America. One common characterization is that Europeans believe less in the idea that effort pays (that is, effort is closely linked to income) than Americans, and so they support a larger public sector. Americans, in contrast, are more likely to believe that people, by and large, get what they deserve and support a smaller government (for example, Piketty, 1995). Alesina, Glaeser and Sacerdote (2002) report that 60 percent of Americans believe that the poor are lazy as opposed to just unlucky, while only 26 percent of Europeans hold this belief.

These differences in background beliefs imply different public reactions to economic circumstances. Alesina, Di Tella and MacCulloch (2004) obtain measures of inequality and happiness for the United States for the period 1981–1996 and for Europe for 1975–1992. They observe that individuals have a tendency to report themselves less happy when inequality is high, even after controlling for individual income, year and country (or state, in the case of the United States) dummies. The effect, however, is more precisely defined statistically in Europe (where the happiness regression coefficient on inequality is more negative and the standard error lower) than in the United States. In addition, striking differences exist across groups. In Europe, the poor and those on the left of the political spectrum tick down their happiness scores when inequality is high; in the United States, the happiness of the poor and of those on the left is largely uncorrelated with inequality. Indeed, in the United States, there is some evidence that the rich-left report lower happiness scores when inequality is high. These findings are consistent with the assumption that Americans have a perception (not necessarily a reality) of living in a mobile society, where individual effort can move people up and down the income ladder, whereas Europeans believe that they live in less mobile societies. Research on these issues is particularly interesting in the context of transition economies, where perceptions of mobility may strongly affect the support for reforms and legitimacy of capitalism (Graham and Pettinato, 2001; Senik, 2004).

Extending these ideas using micro-level data, we can test directly whether people who hold different beliefs about mobility may also differ in the effect of income on their happiness. The third wave of the World Values Survey (1995–1997) asked more than 43,000 people across 36 countries the question, “In your opinion, do most poor people in this country have a chance of escaping from poverty, or there is very little chance of escaping?” The two relevant answers are “1. They have a chance” or “2. There is very little chance.” Table 4 reports the effect of real income on the happiness of those who hold the mobility belief compared to those who hold the alternative belief (*No chance of escape*). In this regression, happiness scores on a scale of 1–10 are the dependent variable, while the explanatory variables are real income, a dummy variable indicating whether the person believes that there is little or no chance of escaping from poverty, this variable interacted with income, a dummy variable for country and other personal characteristics. The latter include age, sex, employment and marital status.

The coefficient on the interaction term is positive, suggesting that lower

Table 4

**How Beliefs Change the Effect of Personal Income on Happiness: 36 Countries in 1997**

|   |                 |
|---|-----------------|
| <i>Real income</i>                        | 0.54<br>(0.12)  |
| <i>No chance of escape</i>                | -0.65<br>(0.09) |
| <i>Real income * No chance of escape</i>  | 0.17<br>(0.05)  |
| <i>Personal characteristics included?</i> | Yes             |
| <i>Dummy variables</i>                    | Country         |
| R <sup>2</sup>                            | 0.30            |
| No. of observations                       | 43,790          |

*Source:* Data are from the Third Wave (1995–1997) of the World Values Survey.

*Notes:* The dependent variable in all regressions is the answer to the question: “All things considered, how satisfied are you with your life as a whole these days? Please use this card to help with your answer.” The answers range from 1, “Dissatisfied,” to 10, “Satisfied.” The method used is ordinary least squares regression, with standard errors in parentheses. *Real income* is measured in U.S. dollars using 1995 price levels and exchange rates. *No chance of escape* is a dummy variable that equals 1 when the second category is chosen as the answer to the question, “In your opinion, do most poor people in this country have a chance of escaping from poverty, or there is very little chance of escaping?” The two answers are a) “They have a chance” and b) “There is very little chance.”

income more adversely affects one’s happiness if it is accompanied by a belief that poverty tends to be a permanent state. The key idea is that the effect of income on happiness appears to depend on the beliefs that people hold.

## Conclusions

Happiness data are being used to tackle important questions in economics. Part of this approach is quite natural, as many questions in economics are fundamentally about happiness. But the approach departs from a long tradition in economics that shies away from using what people say about their feelings. Instead, economists have built their trade by analyzing what people do and, from these observations and some theoretical assumptions about the structure of welfare, deducing the implied changes in happiness. Economists who believe that welfare can be measured to some extent by happiness surveys have an easier time. They simply compare measures of welfare, and what causes changes in welfare, under different scenarios. Of course, results based on happiness surveys should be treated critically and cautiously. But the two main alternatives for determining social welfare—either trying to back social welfare out of observed behavior or simply giving up and leaving it to the politicians—surely need to be treated critically and cautiously, too. The patterns observed in the empirical measures of welfare and happiness deserve to play at least some role in the

evaluation of what social goals to emphasize, what macroeconomic tradeoffs are acceptable and what public policies are pursued.

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