

The Pursuit of Happiness

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Contemporary cross-cultural comparisons of life satisfaction show that survey research, by going to the people broadly and representatively, is a crucial complement to ethnography. Using the survey approach, the present article poses the following research question: is happiness driven more by economic or psychological factors? This question is investigated in the English and German populations with the British Household Panel Survey (BHPS), the German Socio-Economic Panel (GSOEP), and the European Social Survey (ESS). The results of the present study show that English and German life satisfaction follow different time trends and have different compositions. Both are driven more by psychological than economic factors, but Germans are more economically sensitive. The $R^2 = .59$, achieved here for explaining English happiness, appears to be the highest yet recorded in the quality-of-life literature. This English R^2 increases to .78 when a personality effect is included in the multiple-item predictor. Moreover, in the financial, housing and medical spheres of experience subjective representations of physical variables, rather than the physical scales themselves, are the operational determinants of life satisfaction. Finally, an important methodological result emerges in the present study; namely, ordinary regression of cardinal satisfaction scales can replace logistic regression in revealing the values of a nation.

Keywords: Life satisfaction, economic versus psychological determination, panel versus cross-sectional regression, cardinal versus ordinal regression (slope plot), subjective versus objective predictors, multiple-item indicators, revealed values.

Formulating the Happiness Construct

Perhaps the earliest research program on the quality of life dates back to Bradburn (1969) who separated the positive and negative dimensions of "psychological well being". Bradburn (1969:6) postulated that "... the cycle of positive affect ... goes on independently of the negative affect". This distinction has recently been emphasized in psychology (Wallis 2005:A3): "For most of its history, psychology had concerned itself with all that ails the human mind: anxiety, depression, neurosis, obsessions, paranoia, delusions. The goal of practitioners was to bring patients from a negative, ailing state to a neutral normal, or, as Martin Seligman puts it, 'from a minus five to a zero' ". Wallis (2005:A3) also points up Seligman's attempts "... to share a vision of a new goal for psychology. I realized that my profession was half-baked. It wasn't enough for us to nullify disabling conditions and get to zero. We needed to ask, what are the enabling conditions that make human beings flourish? How do we get from zero to plus five?". The earlier work by Bradburn (1969), along with Seligman's (2002) contemporary work, clearly distinguishes happiness from unhappiness, and this distinction opens the way for a further characterization of happiness

itself. The most prominent approach thus far is to view happiness as individual satisfaction. Veenhoven (1991:17) states that "... life satisfaction is conceived as the degree to which an individual judges the overall quality of his life-as-a-whole favourably" and she uses happiness as a synonym. Inglehart and Klingemann (2000) calculate an average between survey results for happiness and for satisfaction. Lane (2000) attempts to make a theoretical distinction between happiness and satisfaction but does not apply this distinction in his actual research. He states that "... happiness is a mood; satisfaction with life is a more cognitive judgement" (Lane 2000:275). Lane also makes the point that happiness can be understood in relation to marginal utility: "The feeling of wanting more is part of the very concept of happiness" (Lane 2000:275).

According to (Campbell et al. 1976:8) satisfaction is "... precisely defined as the perceived discrepancy between aspiration and achievement". In reference to these authors, Gundelach and Kreiner (2004:363) add the notion that happiness and satisfaction are highly correlated rather than identical variables. On this point Michalos (2004:37-38) notes: "... different people have had very different ideas about the nature of happiness or of an overall good quality of life ... virtually all research has shown that happiness and life satisfaction share some common meaning ... when people talk about satisfaction or happiness with their whole lives, they are typically referring to a relatively lasting, justified, good feeling and attitude about their lives. So, a theory of life satisfaction could be interpreted as a theory of happiness, and in general such theories would be theories of subjective well-being. However, because measures of happiness and life sat-

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isfaction do not have identical connotations or denotations, it is worthwhile to analyze their components and correlates separately". This distinction between happiness and satisfaction, however, is not shared by Cummins (1997:6) who emphasized that "... the quality of life (QOL) construct has a complex composition, so it is perhaps not surprising that there is neither an agreed definition nor a standard form of measurement".

The present work opts for the "cognitive" definition of happiness as life satisfaction. This definition is similar to that advanced by Seligman (2002). As Wallis (2005:A7) notes, Seligman emphasizes the remembering self: "For him, studying moment-to-moment experiences puts too much emphasis on transient pleasures and displeasures. Happiness goes deeper than that, he argues ... As a result of his research, he finds three components of happiness: pleasure (the smiley-face piece), engagement (the depth of involvement with one's family, work, romance and hobbies) and meaning (using personal strengths to serve some larger end). Of those three roads to a happy, satisfied life, pleasure is the least consequential, he insists: "This is newsworthy because so many Americans build their lives around pursuing pleasure. It turns out that engagement and meaning are much more important'".

Earlier work interpreting happiness as overall life satisfaction is found in Veenhoven (1991), and Inglehart and Klingemann (2000) cited above. This approach was anticipated by Mastekaasa and Moum (1984:392) who define QOL (Quality of Life) as a unidimensional phenomenon relating to mood of affect ('happiness' or 'satisfaction'). Finally, the most recent and explicit definition of happiness as overall life satisfaction has been employed by Van Praag and Ferrer-i-Carbonell (2004) and Ferrer-i-Carbonell and Frijters (2004) who studied happiness using the British Household Panel Survey and the German Socio-Economic Panel.

Ordinal vs. Cardinal satisfaction

Life satisfaction will be measured here by respondent ratings on the German Socio-Economic Panel (GSOEP) and the British Household Panel Survey (BHPS). The operational definition of happiness on the GSOEP is given by the following questionnaire item:

*All things considered, how satisfied are you with your life?*¹

0	1	2	3	4	5	6	7	8	9	10
Completely										Completely
Dissatisfied										Satisfied

In discussing these GSOEP and BHPS items, Ferrer-i-Carbonell and Frijters (2004:641) note that cardinal satisfaction assumes "... that the difference in happiness between 4 and 5 for any individual is the same as between 8 and 9 for any other individual". In contrast, ordinal satisfaction treats 4 as less than 5 and 8 as less than 9, making no assumptions about their differences. In regressing the GSOEP happiness

question above on several potential determinants of happiness, the above authors (p. 655) found that "... assuming cardinality or ordinality of the answers to general satisfaction questions is relatively unimportant to results when satisfaction is measured and regressed at the individual level". This finding was also supported earlier by Diener et al. (1995:861) at the aggregate level. When run over nations, Pearson (cardinal) and Spearman (rank-order) correlations between aggregate SWB and aggregate per capita income were similar. This cardinality is further justified by Pavot and Diener (1993) who found that numerical ratings like those above agree with peer reports and show good temporal reliability over a one-month period. In view of these findings, which support a metric coding tradition in the social sciences, the GSOEP and BHPS scales above will be interpreted as cardinal. Added justification for cardinally measured happiness is found in the appendix, which contains a major methodological result from the GSOEP and BHPS data sets.

Happiness: Cause or Effect?

Bottom-up versus top-down theory

Is happiness, defined and measured as life satisfaction, a cause or effect of specific satisfactions? For example, does greater life satisfaction cause more satisfaction with one's social life, or is overall satisfaction itself an effect of social satisfaction? Diener (1984) used the labels "top down" and "bottom up" to describe happiness as "cause" and happiness as "effect".

According to bottom-up theory, various domains of satisfaction (e.g., with health, social life, etc.) combine to determine overall happiness. This classical view in satisfaction research has been pursued with multiple regression methodology. Advocates of this approach include Andrews and Whitey (1976), Campbell et al. (1976), Michalos (2004), Van Praag and Ferrer-i-Carbonell (2004), and Ferrer-i-Carbonell and Frijters (2004).

Top-down influences of life satisfaction on satisfaction with one's marriage, job, standard of living and leisure were found by Headey et al. (1991), who used a correlational methodology (see also Headey and Veenhoven 1989). Diener et al. (2003) reviewed experimental results showing the top-down influence of life satisfaction on social satisfaction.

The evidence through the years reveals both bottom-up and top-down effects between life satisfaction and domain satisfactions. Diener (1984:565) noted: "The top-down and bottom-up dichotomy should serve as a useful device for generating theoretical alternatives and as a heuristic for generating research ideas". Headey et al. (1991:96) stated: "Top-down and bottom-up theories of SWB are likely to remain in contention for the foreseeable future". In a more recent review of this issue in satisfaction research, Lucas (2004:4-6) begins with the position taken by Campbell et al. (1976) "According to Campbell et al., it is the weighted average of

¹ Alternative format: 0 – 6.

...domain satisfaction judgements that leads to overall life satisfaction judgements. ... (However) dispositional theories of well being judgements ... posit that the association between reports of domain satisfaction and global life satisfaction does not result from the bottom-up influence of domains on global satisfaction. Instead, these theorists argue, the causal arrow goes in the opposite direction. ... most researchers who investigate top-down effects attribute these effects to unspecified dispositional processes that effect the covariance between reports of domain and life satisfaction. It is presumed that happy people will report being satisfied with all domains of their lives, even if these domains are objectively bad. Clearly, such effects would pose problems for researchers interested in using reports of well-being to guide public policy" (author's parentheses).

The present resolution

Differences in individual personality dispositions constitute a top-down variable which econometricians call unobserved heterogeneity. These individual personality effects influence domain satisfactions as well as overall life satisfaction. Therefore, if left within the error term of a regression model, they will bias any regression coefficient that measures the effect of a domain satisfaction on life satisfaction. This bias is due to hidden covariance between domain satisfaction and the individual personality effect, as well as between this effect and overall life satisfaction. The approach used in the present paper pulls individual heterogeneity out of the error and into the model as a fixed effect. Fixed effects panel regression resolves the top-down vs. bottom-up controversy by controlling for top-down personality effects. This unbias the bottom-up effects of domain satisfactions, rendering them actionable and policy relevant.

Economic Determinants of Happiness

In their recent study of economic determinants of happiness Ferrer-i-Carbonell and Frijters (2004:656) question "...why individuals expend so much effort on obtaining more income to the extent that most economists since Jevons (1871) have taken this as the main human motivation". The effect of income on happiness has been studied at both the aggregate and individual levels.

Aggregate level

Research on the effect of aggregate income on aggregate happiness is ambiguous. At the national level, happiness in the USA remained flat between 1972 and 1994. Over this period, however, real income increased considerably (Lane 2000; Ott 2001). In contrast, at the international level, recent studies have shown a moderate positive correlation over countries between national subjective well being and national per capita income (Diener et al. 1995; Frey and Stutzer 2002; Layard 2005).

Individual level

At the individual level Ferrer-i-Carbonell and Frijters (2004) have carried out a panel analysis revealing income to have a small positive effect on happiness. This income effect has also been shown by Schyns (2002) in a two-level analysis similar to panel analysis. In her study personal life satisfaction is enhanced by individual income, as well as by a broader economic prosperity in the form of real GDP.

Small positive effects of income on happiness have also been summarized by Cummins (2000) who reports bivariate correlations over individuals between subjective well being (SWB) and personal income. These correlations were observed in studies between 1970 and 1999 in various national populations and various demographic sub-populations. The average correlation between SWB and personal income in low-income groups was 0.257, whereas this average correlation within higher income groups was 0.135. Cummins (2000:150-151) notes that these results "... demonstrate that personal income is a very important element in the maintenance of SWB, most particularly for people who are poor".

Results below will qualify the effect of income on happiness. In particular, it will be shown that happiness is driven more by one's feelings about income than it is by monetary accumulation per se. That is, this objective economic variable is filtered psychologically. This is an important substantive fact which also has the useful effect of avoiding non-response to the "difficult" income question in surveys. Many respondents are unwilling to report their monetary income, whereas almost all are willing to say how satisfied they are with it.

Psychological Determinants of Happiness

In emphasizing the non-economic determinants of happiness Ferrer-i-Carbonell and Frijters (2004:656) surmise that the effect of many economic variables used to date will change in the presence of fixed individual traits. For example, Michalos (2004), in reporting the results of eleven different surveys from 1979 until 2000, found that self-esteem was the leading predictor of happiness. He also reports the results of another 1998 survey showing that happiness scores strongly regressed on measures of mental health, depression, and self-esteem ($R^2 = 0.53$). The earlier work of Andrews and Whitey (1976) found self-efficacy to be the most important predictor of overall well being. Thus, the research on quality of life, beginning with Bradburn (1969), demonstrates the importance of psychological determinants of happiness. Nonetheless, only a limited number of these psychological factors can be included in national multi-purpose surveys such as the BHPS and GSOEP, whose themes are "Living in Britain" and "Leben in Deutschland". Personality variables will inevitably remain omitted in regressions that attempt to explain human happiness. Therefore, as emphasized by Ferrer-i-Carbonell and Frijters (2004), panel regressions are needed in order to include these psychological traits as fixed individual effects.

The Research Question

Happiness is a fundamental human pursuit that is crucial to the government and policy makers of a nation. Frankel (2004:6) has noted that "... when quality of life can be measured and reported via surveys, then public and political debate are more likely to be based on facts, not anecdote". But what is more important in making people happy? Is it material wealth and success? Or does it involve the fulfilment of our psychological needs and those of others? Might it also involve good mental and physical health?

The following study explores the determinants of happiness empirically and poses the following research question: is happiness driven more by economic or psychological factors? This question will be investigated in the German and English populations, for whom the balance between economic and psychological factors will be compared by means of panel and cross-sectional regressions. Survey regression is a useful indirect method for revealing national values that are not explicitly solicited on questionnaires themselves.

Selected Panel Surveys

As already emphasized, unobserved personality traits that determine happiness, but elude questionnaires, reside in the error term of survey regressions. If these traits are correlated with both life satisfaction and regressors explicitly included in the model, it is well known that the coefficients of these regressors will be biased. Thus, in explaining happiness, it is important to follow respondents longitudinally so that (inevitably) unmeasured personality traits can be included as fixed effects in the panel regression model. The inclusion of these effects in panel studies, which is impossible in cross-sectional regressions, protects the regression effects from being biased.

In the present study life satisfaction and domain satisfaction responses, along with other potential determinants of happiness, are drawn from the BHPS and the GSOEP. Descriptions of the sampling for these two national panels have been given by Buck et al. (2003), Haisken-DeNew and Frick (2003), and Hanefeld (1984).

Targeted English and German Populations

The British subpopulation targeted here is drawn from the sixteen BHPS regions of England. Region 17 (Wales), Region 18 (Scotland), and Region 19 (Northern Ireland) have been excluded in this study. This exclusion provides a more homogeneous cultural analysis by eliminating any Welsh, Scotch, and Irish sub-cultural effects from the British sample.

The German sample, in turn, has been restricted to the GSOEP sub-sample of West German nationals. Thus, the West German immigrant population and the entire East German population are excluded here. Despite the language and pre-World War II history that East and West Germans share, it is necessary to exclude East Germans from the present study because theirs is a population recently emerging from communism. To substantiate this omission, it is noted that

other multi-national surveys involving Germany have also separated its eastern and western regions. As in the case with England, these exclusions make the German sample more homogeneous in assessing national values. These BHPS and GSOEP samples access two major and prosperous subpopulations of the European Union.

BHPS Item Nonresponse

The survey method here is longitudinal with panel respondents contacted annually. All members 16 years of age and older of core respondent households are interviewed. The present study draws upon the core BHPS sample (without the Scotland, Northern Ireland, and Wales additions) over the years 1996 through 2000 inclusive. These are the only waves of the BHPS that include questions about specific and overall life satisfactions. These satisfaction items have a response rate of approximately 94%, which is slightly lower than the response rate of approximately 97% for the other items in the present study.

In panel regression an observation (or case) consists of a person-wave. The BHPS dataset here contained 44,425 person-waves. The software for this analysis (Stata 2003) deleted those person-waves containing a missing response for any item in the panel regression. Due to this casewise deletion, the BHPS regression in Table 1 below used 41,067 person-waves involving 10,988 persons. This 8% reduction in cases leaves an adequate and very large unbalanced panel for the present analysis.

GSOEP Item Nonresponse

Again, the survey method is longitudinal with the West German panelists being contacted annually. As in the BHPS, all household members 16 years of age and above were included in the survey. The present study also monitors West German panelists over the years 1996 through 2000 inclusive.

German item nonresponse is less than that of the British. Most of the GSOEP items enjoy a response rate that is greater than 99%. Exceptions are items addressing worry, which have an approximate 99% response rate, and income satisfaction which has a response rate of 98%. Once again, item non-response is not an issue because of the large number of fully responding panelists in the GSOEP regression below.

The GSOEP data set for the present study contains 30,913 person-waves for the West German sample. After casewise deletion of those person-waves with any missing response, the regression in Table 2 used 29,466 person-waves involving 7,205 persons. This 5% reduction, which is less than the 8% reduction for the English, also leaves a very large unbalanced panel for the German regression analysis.

Survey Questions for the Panel Regressions

The BHPS and GSOEP are multi-purpose surveys offering widely ranging questions at the national British and

German levels, but they are not explicit studies of happiness. Nevertheless, the BHPS and GSOEP questionnaires cast broad nets for revealing happiness in a wide array of human activities and endeavours. The BHPS surveys the following areas: "...labour markets; income; savings and wealth; household and family organization; housing; consumption; health; social and political values; education and training" (Buck et al. 2003:1). The GSOEP survey topics are: "...population and demography; education, training, and qualification; labour market and occupational dynamics; earnings, income and social security; housing; health; household production; basic orientation (preferences, values, etc.) and satisfaction with life in general and certain aspects of life" (Haisken-DeNew and Frick 2003:14).

As the above lists show, the BHPS and GSOEP offer broad linguistic frameworks, labelled "Living in Britain" and "Leben in Deutschland", that are potential receptacles for capturing happiness in two modern EU societies. These two questionnaires provide comprehensive in-country frames of activities and concerns from which to select items relevant to happiness. Because different items are used on the BHPS and GSOEP, the results in Table 1 and 2 below should be interpreted as within country outcomes only.

The first stage of item selection was a judgemental exercise that selected 60 BHPS items and 52 GSOEP items with respect to their potential for explaining happiness. The second empirical stage of item selection was governed by the criteria of statistical significance and demographic consistency. Hence, the BHPS questions in Table 1 are those with significant slopes in an initial regression using 60 predictors whose significance also held up in each of six demographic subsamples. These English groups were men vs. women, younger vs. older, and lower income vs. upper income. Similarly, those GSOEP questions relevant to happiness (in Table 2) have been chosen from 52 regressors in an initial German run. These regressors also held up for each of the same six subpopulations in West Germany. The details and results of these regressions are given in the next section.

BHPS Item Selection

The panel equation for the initial BHPS regression was

$$Y_{it} = \mu + \beta_1 X_{1it} + \beta_2 X_{2it} + \dots + \beta_{60} X_{60it} + \alpha_i + e_{it} \quad (1)$$

where

- Y_{it} = individual i 's life satisfaction rating on wave t ,
- X_{1it} = the first regressor, etc.,
- α_i = the unobserved effect of individual i 's personality on his (her) life satisfaction,
- e_{it} = residual error.

The initial issue here is whether α_i is a fixed effect to be estimated in the model or a random effect to be included with the residual error e_{it} . This was addressed by running two regressions with α_i as a fixed and random effect respectively. Subsequently, a Hausman specification test rejected the random effect version. Consequently, α_i was treated as a

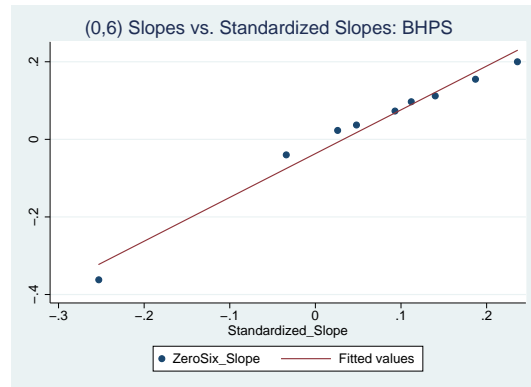


Figure 1. (0,6) Slopes vs. standardized slopes: BHPS

fixed effect, and the estimates of the slopes $\beta_1, \dots, \beta_{60}$ were used to select those regressors having a statistically significant impact on overall life satisfaction.

Table 1 exhibits nine BHPS items whose responses are predictive of overall life satisfaction in the initial (whole-sample) regression and the six demographic regressions. The dependent variable Y_{it} is described at the top of the table. The standardization of all responses on a (0,6) scale remedies the BHPS coding, which does not allow the comparison of regression coefficients. This panel regression was run over waves $t = 1996 \dots 2000$ which, as already noted, are those years the BHPS included overall and specific life satisfaction items.

GSOEP Item Selection

Table 2 exhibits the GSOEP items whose responses are predictive of overall life satisfaction. These ten regressors were selected from 52 candidate items by the same screening and demographic criteria used for the BHPS. The coefficients in Table 2 also result from a panel regression over the five waves between 1996 and 2000. These ten slopes $\beta_1, \dots, \beta_{10}$ were estimated for a fixed effects model whose random effects counterpart was rejected by a Hausman specification test. These estimated slopes appear in the last column of Table 2.

Justification for (0,6) and (0,10) Calibration of Variables

The slopes in Table 1 and 2, obtained under (0,6) and (0,10) regressor coding, were compared with beta weights for regressors calibrated in standard (z) scores. The slope plots in Figure 1 and 2 reveal a close linear correspondence between coefficients calculated under these two regressor calibrations. This result supports the codings in Tables 1 and 2, which render regression slopes comparable within (but not between) the English and German panels.

Table 1: BHPS items, response codes, and happiness effects ($R^2=.59$)

Item	Response coding	Coefficient
Overall life satisfaction	0 (dissatisfied) 1 2 3 4 5 (satisfied) 6	
Psychological distress	0 (low) (high) 6 in 36 equal steps	-.34 (0.007)
Satisfaction with social life	0 1 2 3 4 5 6	.16 (.005)
Satisfaction with use of leisure time	0 1 2 3 4 5 6	.14 (.005)
Satisfaction with health	0 1 2 3 4 5 6	.10 (.004)
Satisfaction with house/flat	0 1 2 3 4 5 6	.07 (.004)
Satisfaction with household income	0 1 2 3 4 5 6	.07 (.004)
Satisfaction with amount of leisure time	0 1 2 3 4 5 6	.04 (.004)
How well are you managing financially?	0 (difficult) 1.5 3 4.5 (comfortable) 6	.03 (.004)
Unemployed	0 (no) (yes) 6	-.02 (.005)

Note: The regression slopes and standard errors (in parentheses) in the last column were obtained from a fixed-effects panel regression. All coefficients are significant beyond the .001 level in predicting overall life satisfaction. The nine regressors are used in the construction of a multiple-item indicator of English happiness described below.

Table 2: GSOEP items, response codes, and happiness effects ($R^2=.49$)

Item	Response coding	Coefficient
Overall life satisfaction	0 (dissatisfied) 1 2 3 4 5 6 7 8 9 (satisfied) 10	
Satisfaction with standard of living	0 1 2 3 4 5 6 7 8 9 10	.18 (.007)
Satisfaction with health	0 1 2 3 4 5 6 7 8 9 10	.12 (.006)
Satisfaction with household income	0 1 2 3 4 5 6 7 8 9 10	.07 (.006)
Satisfaction with free time	0 1 2 3 4 5 6 7 8 9 10	.06 (.005)
Satisfaction with dwelling	0 1 2 3 4 5 6 7 8 9 10	.04 (.006)
Health rating	0 (bad) 2.5 5.0 7.5 (good) 10	.09 (.006)
Worry about own finances	none = 0 some = 5 much = 10	-.05 (.003)
Worry about environmental protection	none = 0 some = 5 much = 10	.02 (.003)
Handicapped	no = 0 a little = 5 great = 10	-.03 (.004)
Unemployed	0 (no) (yes) 10	-.04 (.004)

Note: The regression slopes and standard errors (in parentheses) in the last column were obtained from a fixed-effects panel regression. All coefficients are significant beyond the .001 level in predicting overall life satisfaction. The ten regressors are used in the construction of a multiple-item indicator of German happiness described below.

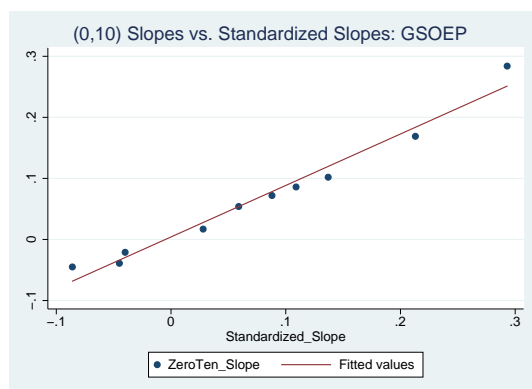


Figure 2. (0,10) Slopes vs. standardized slopes: GSOEP

Within- and Cross-National Results

Subjective vs. Objective Predictors of Happiness

The economic variables in Tables 1 and 2 are subjective representations of other variables, measured in monetary units, that have been controlled out of our regressions. Household incomes, mortgage/rent payments, weekly grocery bills, credit payments and expenditures for big ticket durables were not significant determinants of life satisfaction when their subjective counterparts such as income satisfaction and financial security are also present in the regression.

Similar results are observed for economic variables associated with one's dwelling. Thus, the objective items for house type and number of rooms, as well as the presence or absence of central heating and a garden, do not reach statistical significance when their subjective counterpart, dwelling satisfaction, is in the regression. Moreover, in Table 2 the objective health variable handicapped carries less weight in happiness than subjective health satisfaction and health rating.

These results demonstrate that in the financial, housing and medical spheres of experience subjective representations of physical variables are the operational determinants of life satisfaction. This has also been confirmed by Van Praag and Ferrer-i-Carbonell (2004, Ch.4) who used a different regression strategy. These researchers first regressed life satisfaction, measured on the BHPS and GSOEP, on various objective predictors, e.g. age, household income, years of education and savings. Their R^2 s were less than .09 for West Germany and less than .08 for Britain. When Van Praag and Ferrer-i-Carbonell subsequently regressed life satisfaction on the subjective regressors discussed above, their R^2 s rose to .46 for West Germany and .49 and .53 for Britain.

Finally, in the present study even the most prominent domain satisfactions, satisfaction with social life in England and satisfaction with standard of living in West Germany, were not themselves predictable from broad sets of explanatory variables. Their R^2 s were .02 for the BHPS and .11 for the GSOEP. These results are consistent with those of Van

Praag and Ferrer-i-Carbonell (2004, Ch.2; Ch.3) who found R^2 s ranging between .01 and .22 when specific satisfactions were regressed on various objective predictors in the BHPS and GSOEP. It would appear, therefore, that even specific satisfactions remain resistant to prediction by "objective" variables.

German and English Happiness Profiles

The present study accounts for more English life satisfaction ($R^2=.59$) than German life satisfaction ($R^2=.49$). This is in part due to the inclusion of psychological distress in the English regression. The English R^2 of .59 would appear to be the highest proportion of happiness variance yet explained in the quality of life literature, ranging back to Bradburn (1969). It is interesting to observe that the multi-purpose BHPS questionnaire items have been able to give a better accounting of overall life satisfaction than other questionnaires designed through the years to explicitly measure quality of life (Andrews and Whitey 1976; Veenhoven 1991; Michalos 2004).

Table 1 reveals that English happiness is more highly associated with psychological factors. These include psychological distress (-.34), satisfaction with social life (.15), satisfaction with use of leisure time (.14), and satisfaction with health (.10). A demographic breakdown by age, gender and income revealed that the rank order of these coefficients was identical in six separate regressions over women, men, younger respondents, older respondents, lower income respondents and higher income respondents. Because this rank order is the same as that for the whole sample, the factors that matter for happiness are consistent in the English population and its subpopulations.

A demographic breakdown for West Germany was also carried out by age, gender, and income. With one exception, the rank order of the top German regression coefficients in every demographic sub-sample was identical to that for the whole sample. This national rank order can be seen in Table 2, which shows that the highest German coefficients are satisfaction with standard of living (.17), satisfaction with health (.11), and health rating (.08). The exceptional case occurred for higher income Germans, where widowhood had a (negative) impact on happiness that exceeded health rating. As with the English, the factors that matter for happiness are consistent in the German population and its sub-populations.

Despite the demographic consistency of the national value profiles in Tables 1 and 2, our inquiry into the determinants of happiness remains unanswered by the GSOEP. Because psychological distress and satisfaction with social life were not measured in Germany, they cannot be compared with the strong German economic predictor satisfaction with standard of living. Therefore, other pan-European data will now be invoked to shed further light on our research question.

The European Social Survey

The ESS (2004) poses the same questions in every country about one's social life, standard of living, and distress in the same response format. The items in the left column of Table 3 were selected from the ESS 2004 questionnaire to

bear upon the psychological vs. economic determination of happiness. Psychological distress was measured as the score on a six-item scale derived from the 2004 ESS data. All other predictors for the regressions in Table 3 were scored from single items. The dependent variable for these regressors was a single-item rating of life satisfaction.

Item non response. The British sample contained 1897 individuals in the 2004 ESS survey. A 9% casewise deletion of persons with a missing response for any variable resulted in an English regression using 1733 individuals. The German data set contained 2870 individuals. A similar casewise deletion produced 2598 individuals for the regression summarized in the last two columns of Table 3. This is also a 9% reduction in cases.

English vs. German regression effects. The coefficients in Table 3 show that psychological distress has a negative but equal impact on life satisfaction in England and Germany. Social contact, social activity, and intimate discussion have no impact on life satisfaction in either country. These three ESS items solicit descriptions of one's social situation and not one's satisfaction with it.

Table 3 shows Germans to have significantly higher negative coefficients on contribution to household income and difficulty on present income. Apparently, German life satisfaction is more sensitive than British life satisfaction to one's work burden and economic hardship.

Within country profiles. Finally, the beta weights in Table 3 directly compare psychological and economic effects on life satisfaction within England and Germany. These standardized coefficients answer the present research question; namely, psychological factors play a stronger role than economic factors in life satisfaction. This dominant psychological orientation prevails in both Germany and England.

Advantages of the Personality Effect

Unbiased Bottom-Up Effects

Referring to equation (1), α_i may affect both life satisfaction Y_{it} and domain satisfaction X_{1it} . If left uncontrolled within the error term, this common effect on both the dependent and independent variables will result in an upwardly biased β_1 coefficient. This is remedied by a fixed effects panel regression, which controls the personality effect by transferring it from the error to the model. This unbias the bottom-up domain effects reported in Table 1 and 2.

Table 4 and 5 exhibit the correlations between the estimated personality effect and the dependent and independent variables in the English and German panels. These correlations, which have been controlled in Table 1 and 2, profile the relations of the personality effect over life satisfaction and its predictors. Table 4 and 5 show large correlations between this individual disposition and life satisfaction. Among the independent variables, the personality effect is most highly

correlated with satisfaction with social life for the English and satisfaction with standard of living for the Germans. These same specific satisfactions were prominent predictors of life satisfaction in Table 1 and 2.

Incremental Prediction

Predicted life satisfaction is given by:

$$y_{it} = m + b_1X_{1it} + b_2X_{2it} + \dots + b_kX_{kit} + a_i \quad (2)$$

where

y_{it} is an estimate of rated life satisfaction Y_{it} ,
 $X_{1it} \dots X_{kit}$ are the predictors in Table 1 (k=9) or Table 2 (k=10),
 a_i is individual i 's estimated personality effect.

The squared correlation between y_{it} and Y_{it} is .78 for the English panel regression, which is .19 higher than the R-square of .59 reported in Table 1. This increment is due to the inclusion of the estimated personality effect a_i .

The inclusion of individual i 's effect in the German prediction equation increased the R-square from .49 in Table 2 to .73. This even greater increment of .24 would appear to be caused by the omission of psychological distress from the GSOEP. This unmeasured variable remains part of a larger German personality effect a_i .

Reliability of the Multiple Item Indicator

Equation (2) gives a micro (person-wave) indicator of life satisfaction. A macro (national) indicator is given by y_t which is the average over individuals for wave t . Both indicators include the bottom-up effects of specific predictors as well as the top-down effect of personality. These micro and macro indicators also remove error at the person-wave and national levels.

Figures 3 and 4 show the time courses for the English and German national indicators in the closing years of the 20th century. English life satisfaction peaked in 1998 before falling sharply. In contrast, German life satisfaction bottomed out in 1997 and then increased up to 2000.

The standard error of the aggregate indicator y_t is always less than that of the aggregate rating Y_t because the error in each rated satisfaction Y_{it} has been removed from its estimate y_{it} in equation (2). Table 6 shows the greater reliability of the aggregate indicator y_t over the years studied here. The reductions in the standard errors in Table 6 are small due to the very large samples in the BHPS and GSOEP. For smaller panels the reductions in standard errors will be substantial.

Discussion

The present study distinguishes happiness from unhappiness, the later state remaining the preoccupation of psychiatry and clinical psychology for over a century. A respite from this orientation was provided by Norman Bradburn (1969)

Table 3: ESS items and life satisfaction effects for the UK and Germany

Item	English		German	
	Coefficient	Beta	Coefficient	Beta
Psychological				
distress	-.45 (.025)	-.44	-.50 (.026)	-.38
Frequency of social contact	.04 ^{ns} (.031)		.04 ^{ns} (.030)	
Participation in social activities	-.03 ^{ns} (.049)		.08 ^{ns} (.052)	
Unavailability of intimate discussion	-.28 ^{ns} (.222)		-.10 ^{ns} (.191)	
Economic				
Contribution to household income (*)	-.03 ^{ns} (.021)		-.10 (.018)	-.09
Difficulty on present income (**)	-.45 (.065)	-.18	-.77 (.066)	-.25
Ease of borrowing money	.09 (.037)	.06	.16 (.038)	.08

Note: The regression slopes and standard errors (in parentheses) were obtained from two cross-sectional regressions. Coefficients marked by ns failed to reach significance at the .05 level in predicting happiness. Single and double stars after variables in the left column indicate significant cross-national differences between regression coefficients at the .01 and .001 levels. All other variables show non-significant cross-national differences.

Table 4: Correlations of the personality effect with life satisfaction and its predictors (BHPS)

Item	Correlation	Item	Correlation
Overall life satisfaction	.60	Satisfaction with house/flat	.15
Psychological distress	-.14	Satisfaction with household income	.13
Satisfaction with social life	.20	Satisfaction with amount of leisure time	.13
Satisfaction with use of leisure time	.18	How well are you managing financially?	.09
Satisfaction with health	.14	Unemployed	-.06



Figure 3: English life satisfaction



Figure 4: German life satisfaction

who studied psychological well being as opposed to various types of negative affect. Bradburn's initiation of life-quality research has been picked up by Seligman (2002) who launched the new field of positive psychology. The life-quality literature, in conjunction with the new positive psychology, presents the definition of happiness as overall life satisfaction. We conclude by positioning this psychological construct in a linguistic framework that facilitates its cross-national study.

Integrating Socio-Psychological Theory and Survey Method

Parekh (2000:14) provides valuable guidance in confronting linguistic impediments in describing and comparing cultures: "We need to rise to a higher level of philosophical abstraction. And since we cannot transcend and locate ourselves in a realm beyond liberal and non liberal cultures, such a basis is to be found in an institutionalized dialogue between them".

This dialogue is aided by quantitative survey research. In addition to the BHPS, GSOEP, and EES used here, the European Commission Household Panel, the Eurobarometer, the European Value Survey, and the International Social Survey Program also draw cross-national data at the individual level. This suggests that survey research, as a societal institution based on national and international infrastructures, can play a crucial role in cross-cultural dialogue and description. Such infrastructures for comparative surveys were addressed at the inaugural conference of the European Survey Research Association (ESRA) in 2005.

In surveying happiness cross-culturally Parekh (2000:267) is again helpful: "We start and cannot but

Table 5: Correlations of the personality effect with life satisfaction and its predictors (GSOEP)

Item	Correlation	Item	Correlation
Overall life satisfaction	.68	Health rating	.17
Satisfaction with standard of living	.31	Worry about own finances	-.12
Satisfaction with health	.23	Worry about environmental protection	-.01
Satisfaction with household income	.23	Handicapped	-.10
Satisfaction with free time	.19	Unemployed	-.03
Satisfaction with dwelling	.20		

Table 6: Standard errors for single- and multiple-item indicators

	1996	1997	1998	1999	2000
England					
Single-item rating	.015	.014	.013	.014	.014
Multiple-item indicator	.013	.013	.012	.012	.012
Germany					
Single-item rating	.022	.022	.023	.023	.023
Multiple-item indicator	.020	.019	.019	.019	.019

start with what I shall call society's operative public values". These values surface in unwritten rules and norms that govern public manners and everyday behaviour among citizens. In particular, the value of happiness itself constitutes a discursive formation (Foucault 1972) which can guide cross-national representations and descriptions. Hall (1997:46) states: "... for Foucault, for example, mental illness was not an objective fact, which remained the same in all historical periods, and meant the same thing in all cultures. It was only within a definite discursive formation that the object, 'madness', could appear at all as a meaningful or intelligible construct". Likewise, it is only within culture-specific discursive formations that the object "happiness" can surface as a well-defined construct that can be probed by survey questionnaires. The linguistic structure of these standardized question and answer sessions will of course depend on the particular discursive formation chosen for the psychology of happiness.

The present work is based on a "cognitive" rather than "hedonic" construction of happiness. This definition is supported by Peterson et al. (2005) who demonstrate that life satisfaction is more strongly related to engagement and meaning than it is to momentary pleasure. Seligman's positive psychology emphasizes the remembering self that responds to satisfaction surveys. These satisfaction responses reveal a culture's deep linguistic structure from survey regressions that quantify the underlying determinants of happiness. The regression of life satisfaction on potential predictors can explain happiness through falsifiable determinants in nationally representative probability samples.

Determinants of Happiness: The Research Question

Previous research on subjective well being has contrasted economic with psychological components of happiness. This points up the importance of panel surveys, which control for unobserved personality traits that are not captured in large national cross-sections. The panel regressions here

control top-down personality effects by transferring them from the error to the model. Estimating these fixed effects unbiases the bottom-up effects of specific domain satisfactions, rendering them actionable and policy relevant. Within this panel framework the present study poses the following research question: is happiness driven more by economic or psychological factors? This question has been studied through survey regressions over the English and German populations in the closing years of the 20th century. The results are both substantive and methodological.

Substantive Findings

The importance of subjective predictors. In the financial, housing and medical spheres of experience subjective ratings, rather than physical scales (Euros, square meters, etc.), are the operational determinants of life satisfaction. That is, subjective regressors are superior to objective regressors in explaining happiness.

English and German happiness. English and German life satisfactions follow different time trends and have different emphases. Both are driven more by psychological than economic factors, but Germans are more economically sensitive. The $R^2 = .59$, achieved here for explaining English happiness, appears to be the highest yet recorded in the quality-of-life literature. This English R^2 increases to .78 when a personality effect is included in the multiple-item predictor.

Level of Measurement

The present work operationally defines the happiness construct as the cardinal rating scales used on the BHPS, GSOEP and ESS. The results here confirm Ferreri-Carbonell and Frijters (2004) and Van Praag and Ferreri-Carbonell (2004) by showing that numerical rating scales generate regression coefficients almost identical to those produced when happiness is ordinally scaled (see appendix). This justifies the cardinal measurement of subjective dependent variables and is good news for social scientists who have

been using numerical ratings for at least 75 years (cf. Likert 1932).

Future Directions

The analyses of the BHPS, GSOEP, and ESS in this work serve as useful templates for studies of happiness in other European nations. Such pan-European research will be facilitated by the methodological finding just summarized; namely, that regression effects reveal national values from cardinal rating scales. Armed with this result, cross-national surveys can discover differential norms that guide the quality of life across various European countries. The resulting knowledge base holds potential value for EU policy making and harmonization.

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Appendix: Justification for Cardinality-Measured Happiness

As a check on cardinality, the numerical codings of life satisfaction in Table 1 and 2 were demoted to seven and eleven ranked degrees of satisfaction. On these weaker ordinal scales 3 represents less satisfaction than 4, and 5 represents less satisfaction than 6. The relinquishment of cardinal units, however, means that the satisfaction increment between 3 and 4 is not assumed equal to that between 5 and 6.

English rank-order life satisfactions were logistically regressed on the variables in Table 1 over 41067 person-waves (Stata 2003). Figure 5 plots the nine slopes for this ordinal regression against those for a cardinal regression over the same 41,067 observations. The near perfect linear relationship, with intercept zero, indicates that these ordinal and cardinal slopes are almost identical up to multiplication. The slope plot in Figure 6 also shows near perfect linearity between ordinal and cardinal coefficients calculated from corresponding regressions over 29,466 German observations. These results support Ferrer-i-Carbonell and Frijters (2004) and Van Praag and Ferrer-i-Carbonell (2004), who found ordinal slopes to be multiples of the slopes obtained when satisfaction was cardinally measured on the GSOEP. A multiplicative relation between cardinal and ordinal regression coefficients even prevails when the dependent variable is binary. Binder (1983) carried out ordinary and logistic regressions of non-users versus users of physician services on demographic and health predictors. Figure 7 plots the 35 slopes for Binder's ordinary regression against those for his logistic regression over 20,726 Canadian respondents. Again, there is a close linear relationship with intercept zero, indicating that cardinal and ordinal regressions produce equivalent slopes even for binary dependent variables. These findings support the usual regression of cardinal scales, which assume equal increments between response options. Ordinary regression therefore appears preferable to logistic regression, which makes more unrealistic assumptions in order to weaken the dependent variable to ordinality. This is welcome news for social scientists who have been cardinally coding rating scales for decades.

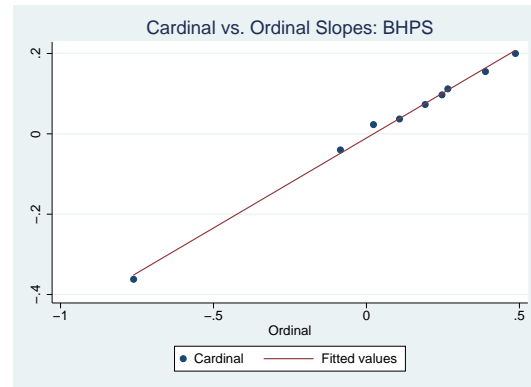


Figure 5. Cardinal vs. ordinal slopes: BHPS

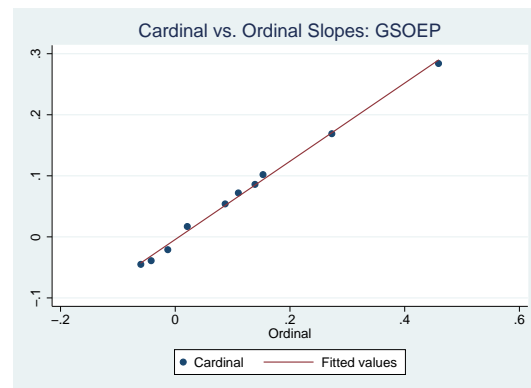


Figure 6. Cardinal vs. ordinal slopes: GSOEP

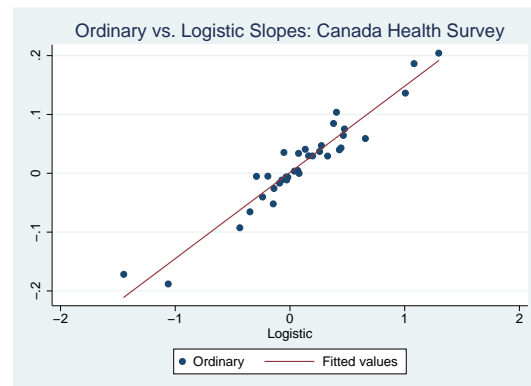


Figure 7. Ordinary vs. logistic slopes: Canada Health Survey ^a
^aSource: This figure was constructed from Table 2 of Binder (1983).