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Well-being over time in Britain and the USA

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Abstract

This paper studies happiness in the United States and Great Britain. Reported levels of well-being have declined over the last quarter of a century in the US; life satisfaction has run approximately flat through time in Britain. These findings are consistent with the Easterlin hypothesis [Nations and Households in Economic Growth: Essays in Honour of Moses Abramowitz (1974) Academic Press; J. Econ. Behav. Org., 27 (1995) 35]. The happiness of American blacks, however, has risen. White women in the US have been the biggest losers since the 1970s. Well-being equations have a stable structure. Money buys happiness. People care also about relative income. Well-being is U-shaped in age. The paper estimates the dollar values of events like unemployment and divorce. They are large. A lasting marriage (compared to widowhood as a 'natural' experiment), for example, is estimated to be worth $100,000 a year.

Keywords: Well-being; Happiness; Britain; USA

> We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable rights, that among these are life, liberty and the pursuit of happiness. US Declaration of Independence, July 4, 1776.

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1. Introduction

One thing that unites different kinds of social scientists is a concern to understand the forces that affect people's well-being. What makes individuals happy? What leads to happy societies? These are difficult questions, but they seem important.

This paper studies the numbers that people report when asked questions about how happy they feel and how satisfied with life. It estimates what we believe to be some of the first micro-econometric happiness equations for US data. We examine their detailed structure and draw a range of conclusions. We also do a formal test of the Easterlin hypothesis that growth does not raise well-being.

There are, transparently, limitations to well-being statistics, and an inquiry of this sort suffers the disadvantage that controlled experiments are out of reach. But it seems unlikely that human happiness can be understood without, in part, listening to what human beings say. Sources of information exist that have for many years recorded individuals' survey responses to questions about well-being. These responses have been studied intensively by psychologists,[1] examined a little by sociologists and political scientists,[2] and largely ignored by economists.[3] Some economists may defend this neglect. They will emphasize the unreliability of subjective data—perhaps because they are unaware of the large literature by research psychologists that uses such numbers, or perhaps because they believe economists are better judges of human motivation than those researchers. Most economists, however, are probably unaware that data of this sort are available, and have not thought of whether empirical measures approximating the theoretical construct 'utility' might be useful in their discipline.

2. On happiness and measurement

One definition of happiness is the degree to which an individual judges the overall quality of his or her life as favorable (Veenhoven, 1991, 1993). Psychologists draw a distinction between the well-being from life as a whole and the well-being associated with a single area of life: these they term 'context-free' and 'context-specific'. These

[1] Earlier work includes Andrews (1991), Argyle (1989), Campbell et al. (1976), Campbell (1981), Diener (1984), Diener et al. (1999), Douthitt et al. (1992), Fox and Kahneman (1992), Larsen et al. (1984), Morawetz et al. (1977), Mullis (1992), Shin (1980), Veenhoven (1991, 1993), Van Praag et al. (1973), and Warr (1990).

[2] For example, Inglehart (1990) and Gallie et al. (1998). There is also a related empirical literature on voting behavior; see for example Frey and Schneider (1978).

[3] The recent research papers of Andrew Clark, Bruno Frey and Yew Kwang Ng are exceptions (Clark, 1996; Clark and Oswald, 1994; Frey and Stutzer, 1999, 2000; Ng, 1996, 1997). See also Easterlin and Schaeffer (1999), Frank (1985, 1997), Blanchflower and Freeman (1997), Blanchflower and Oswald (1998, 2000), Blanchflower et al. (1993), MacCulloch (1996), Di Tella and MacCulloch (1999), and Di Tella et al. (1998, 2001). Offer (1998) contains interesting ideas about the post-war period and possible reasons for a lack of rising well-being in industrialized society. A recent book by Frey and Stutzer (2001) provides an overview of the economics of happiness. New work has also been done by Graham (2001), Graham and Pettinato (2002) and Helliwell (2001). Clark and Oswald (2002b) is a review written for epidemiologists.

researchers view it as natural that a concept such as happiness should be studied in part by asking people how they feel.

One issue in the psychology literature has been whether a well-being measure is, in their terminology, reliable and valid. Self-reported measures are recognized to be a reflection of at least four factors: circumstances, aspirations, comparisons with others, and a person's baseline happiness or dispositional outlook (e.g. Warr, 1980; Chen and Spector, 1991). Konow and Earley (1999) describe evidence that recorded happiness levels have been demonstrated to be correlated with the following.

1. Objective characteristics such as unemployment.
2. The person's recall of positive versus negative life-events.
3. Assessments of the person's happiness by friends and family members.
4. Assessments of the person's happiness by his or her spouse.
5. Duration of authentic or so-called Duchenne smiles (a Duchenne smile occurs when both the zygomatic major and obicularus orus facial muscles fire, and human beings identify these as 'genuine' smiles).
6. Heart rate and blood-pressure measures responses to stress, and psychosomatic illnesses such as digestive disorders and headaches.
7. Skin-resistance measures of response to stress.
8. Electroencephelogram measures of prefrontal brain activity.

Rather than summarize the psychological literature's assessment of well-being data, this paper refers readers to the checks on self-reported happiness statistics that are discussed in Argyle (1989) and Myers (1993), and to psychologists' articles on reliability and validity, such as Fordyce (1985), Larsen et al. (1984), Pavot and Diener (1993), and Watson and Clark (1991).

The idea used in the paper is that there exists a reported well-being function

$$r = h(u(y, z, t)) + e \tag{1}$$

where r is some self-reported number or level (perhaps the integer 4 on a satisfaction scale, or 'very happy' on an ordinal happiness scale), $u(\ldots)$ is to be thought of as the person's true well-being or utility, $h(.)$ is a continuous non-differentiable function relating actual to reported well-being, y is real income, z is a set of demographic and personal characteristics, t is the time period, and e is an error term. As plotted in Fig. 1, the function $h(.)$ rises in steps as u increases. It is assumed, as seems plausible, that $u(\ldots)$ is a function that is observable only to the individual. Its structure cannot be conveyed unambiguously to the interviewer or any other individual. The error term, e, then subsumes among other factors the inability of human beings to communicate accurately their happiness level (your 'two' may be my 'three').[4] The measurement error in reported well-being data would be less easily handled if well-being were to be used as an independent variable.

[4] It may be worth remarking that this approach recognises the social scientist's instinctive distrust of a single person's subjective 'utility'. An analogy might be to a time before human beings had accurate ways of measuring people's height. Self-reported heights would contain information but be subject to large error. They would predominantly be useful as ordinal data, and would be more valuable when averaged across people than used as individual observations.

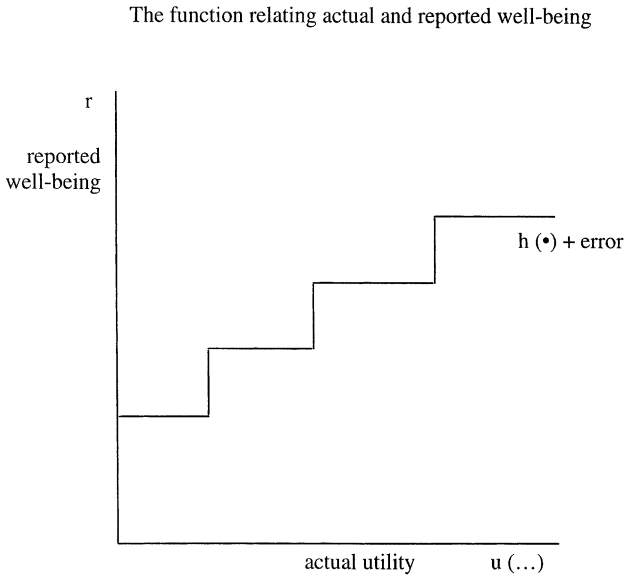

Fig. 1. The function relating actual and reported well-being.

This approach has a Benthamite utilitarian flavor. It may be viewed as an empirical cousin of the experienced-utility idea advocated by Kahneman et al. (1997). The structure of Eq. (1) makes it suitable for estimation as an ordered probit or logit. In this way, 'true' utility is the latent variable, and the subjectivity of responses can be thought of as being swept into the error term.

It is possible to view some of the self-reported well-being questions in the psychology literature as assessments of a person's lifetime or expected stock value of future utilities. Eq. (1) would then be rewritten as an integral over the $u(\ldots)$ terms. This paper, however, will use a happiness question that seems more naturally interpreted as a flow rather than a stock.

In what has since emerged as seminal research, Easterlin (1974), and more recently (1995, 2001) was one of the first social scientists to study data over time on the reported level of happiness in the United States. One of his aims was to argue that individual well-being is the same across poor countries and rich countries. The author suggests that we should think of people as getting utility from a comparison of themselves with others close to them: happiness is relative. Hirsch (1976), Scitovsky (1976), Layard (1980), Frank (1985, 1999) and Schor (1998) have argued a similar thesis; a different tradition, with equivalent implications, begins with Cooper et al. (2001) and Keely (1999). A slightly different form of well-being data is used by Ravallion and Lokshin (2001).

On the trend in well-being over time, Easterlin's paper concludes: '. . .in the one time-series studied, that for the United States since 1946, higher income was not systematically accompanied by greater happiness' (p. 118). This result has become well-known. Oswald (1997) makes the point that Easterlin's data may not actually support it; his longest consistent set of happiness levels seems to find that Americans were becoming happier

(39% very happy in 1946 to 53% very happy in 1957). But, as Easterlin shows, splicing together surveys with slightly different well-being questions over a longer set of years does suggest a flat trend in well-being in the early post-war period.

This paper begins by examining information from the General Social Surveys of the United States. Although little used by economists, these have for many years been interviewing people about their levels of happiness. GSS data are available in most of the years from 1972 to 1998. The size of sample averages $\sim$1500 individuals per annum. Different people are interviewed each year: the GSS is not a panel.

Table 1
Happiness and life satisfaction: averages for different periods. (a) The proportions of people giving different happiness answers in the United States 1972–1998; (b) the proportions of people giving different life-satisfaction answers in Great Britain 1973–1998

	1972–1976	1977–1982	1983–1987	1988–1993	1994–1998
(a)					
All—not too happy	14%	12	12	10	12
All—pretty happy	52	54	56	58	58
All—very happy	34	34	32	33	30
Male—not too happy	14	12	13	9	11
Male—pretty happy	54	56	57	58	58
Male—very happy	32	32	30	34	31
Female—not too happy	13	12	12	11	13
Female—pretty happy	51	53	56	57	59
Female—very happy	36	35	33	32	29
White—not too happy	12	11	11	9	11
White—pretty happy	52	54	56	57	59
White—very happy	36	35	33	34	31
Black—not too happy	26	23	21	18	21
Black—pretty happy	54	54	58	60	58
Black—very happy	20	23	21	22	20
(b)					
All—not at all	4%	4	4	4	3
All—not very	11	10	10	10	10
All—fairly	54	54	55	55	57
All—very	31	32	31	31	31
Male—not at all	4	4	4	4	4
Male—not very	11	10	10	10	10
Male—fairly	55	55	57	57	58
Male—very	30	31	29	29	29
Female—not at all	4	4	3	3	3
Female—not very	12	10	10	11	9
Female—fairly	53	53	54	54	55
Female—very	32	34	32	32	32

Source: General Social Surveys, USA; Eurobarometers, Great Britain.

Table 2
Happiness equations for the United States, 1972–1998 (ordered logits)

(A)	(1) All	(2) Men	(3) Women	(4) Whites	(5) Blacks	(6) Age <30	(7) Age ≥30
Time	−0.0027	0.0021	−0.0062	−0.0044	0.0090	0.0021	−0.0041
	(2.18)	(1.14)	(3.67)	(3.22)	(2.58)	(0.75)	(2.90)
Age	0.0161	0.0167	0.0121	0.0163	0.0040	0.0115	0.0093
	(4.90)	(3.32)	(2.79)	(4.54)	(0.44)	(0.10)	(1.67)
Age^2	−0.0001	−0.0001	−0.0001	−0.0001	0.0001	0.0004	−0.0001
	(3.73)	(1.38)	(2.86)	(3.82)	(0.84)	(0.16)	(1.21)
Male	−0.0499	n/a	n/a	−0.0917	0.1375	−0.2625	0.0112
	(2.46)			(4.14)	(2.44)	(6.10)	(0.49)
Black	−0.7334	−0.6058	−0.8215	n/a	n/a	−0.9380	−0.6747
	(24.14)	(12.51)	(21.03)			(15.04)	(19.36)
Other non-whites	−0.1384	0.0818	−0.3228	n/a	n/a	−0.1971	−0.1236
	(2.24)	(0.89)	(3.86)			(1.76)	(1.66)
Cut1	−1.7326	−1.4886	−1.9569	−1.8230	−0.8000	−1.7498	−1.8488
Cut2	1.0372	1.3328	0.7827	0.9823	1.8538	1.2148	0.8678
N	37,711	16,548	21,163	31,561	5078	8644	29,067
χ^2	679.0	287.9	486.7	61.54	61.59	280.8	411.3
Pseudo R^2	0.0095	0.0093	0.0121	0.0010	0.0062	0.0175	0.0074
LR	−35,354.5	−15,395.5	−19,905.9	−29,355.6	−4921.3	−7865.9	−27,446.1

(B)	(8) Working	(9) Unemployed	(10) OLF	(11) ≤ 12 years education	(12) >12 years education	(13) Married	(14) Not married
Time	− 0.0024	− 0.0004	− 0.0047	− 0.0059	− 0.0044	0.0043	0.0067
	(1.45)	(0.05)	(2.23)	(3.60)	(2.17)	(2.62)	(3.27)
Age	0.0024	− 0.0225	0.0123	0.0234	− 0.0042	− 0.0048	− 0.0430
	(0.39)	(0.83)	(2.43)	(5.79)	(0.72)	(0.90)	(9.32)
Age^2	0.0001	0.0003	− 0.0001	− 0.0002	0.0001	0.0001	0.0004
	(0.95)	(0.80)	(2.15)	(4.41)	(1.48)	(2.40)	(9.50)
Male	− 0.0294	− 0.2247	0.0069	− 0.0044	− 0.1526	− 0.1489	− 0.1249
	(1.10)	(1.76)	(0.18)	(0.17)	(4.76)	(5.58)	(3.78)
Black	− 0.6705	− 0.5051	− 0.7592	− 0.6482	− 0.8337	− 0.6561	− 0.5041
	(16.18)	(3.53)	(15.63)	(17.51)	(15.58)	(13.85)	(12.39)
Other non-whites	− 0.0669	0.1835 (0.86)	− 0.2312 (0.65)	− 0.0375 (2.02)	− 0.2466 (0.44)	0.0100 (2.71)	− 0.2660 (0.12)
Cut1	− 2.1454	− 1.5086	− 1.7074	− 1.3413	− 2.5905	− 2.4807	− 2.4809
Cut2	0.8513	0.9384	0.8142	1.3020	0.4323	0.4140	0.3794
N	22,203	1114	13,593	22,323	15,388	21,649	16,059
χ^2	335.3	16.5	272.9	426.1	4301.0	315.1	278.9
Pseudo R^2	0.0083	0.0074	0.0102	0.0098	0.0108	0.0080	0.0092
LR	− 20,037.2	− 1105.6	− 13,199.6	− 21,436.8	− 13,766.4	− 19,469.6	− 14,986.5

Source: General Social Survey, ORC. *t*-Statistics are in parentheses.

Are Americans getting happier over time? In the early 1970s, 34% of those interviewed in the General Social Survey described themselves as 'very happy'. By the late 1990s, the figure was 30%. For women, the numbers go from 36% at the start of the period, to 29% a quarter of a century later. The raw patterns are in Table 1. The question asked is: '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?' (GSS question 157).

The same wording has been used for the last 26 years. It is clear from the table that there is a reasonable amount of stability in the proportion of people giving different well-being scores, and that, not unexpectedly, the bulk of survey respondents place themselves in the middle category ('pretty happy') of those offered.

To explore the issue more carefully, it is natural to look at a regression-adjusted time trend. Table 2A estimates regression equations in which the dependent variable is reported happiness. These ordered logit equations control only for exogenous demographic characteristics: age, age squared, gender, and race.[5]

Table 2A contains a number of findings that might have been hard to predict. Column 1 of the table shows that America is apparently becoming systematically less happy (in the eyes of Americans themselves). There is a negative time trend, -0.0027, with a t-statistic sufficiently large to allow the null hypothesis of zero to be rejected. Men report lower happiness scores than women, although the size of the difference between males and females appears to be small. Blacks and other non-white races are less happy than whites. This effect is large[6] (we return to the issue later in the paper) and well-defined. The black dummy variable has a coefficient in column 1 of Table 2A of -0.7, with a t-statistic that exceeds 20. There is a concave shape in age. In column 1 of Table 2A, over the relevant range, happiness grows with age. When other controls are introduced, however, it will be seen later in the paper that a minimum emerges around the middle of life. The monotonicity in Table 2A disappears when other independent variables—especially work status and marriage—are added.

Given the starkness of the conclusion that the USA has, in aggregate, apparently become more miserable over the last quarter of a century, it seems useful to examine sub-samples of the population. Later columns of Table 2A do that. Columns 2 and 3 reveal that it is women rather than men who are experiencing the decline in well-being. This might be viewed as paradoxical: the last few decades are often seen as a period in the US in which discrimination against women has come down. Men report flat levels of well-being over this period (the time trend coefficient in column 2 of Table 2A is positive but insignificantly different from zero). In both male and female columns, reported happiness rises as individuals get older. Moreover, the black coefficient is large and negative in both equations. This may be evidence of discrimination against black people.

Columns 4 and 5 of Table 2A separate the data by race. An interesting finding emerges. It can be seen, in column 5, that blacks are the only demographic group to be experiencing

[5] A referee has pointed out that objective indicators such as GDP per capita are not usually presented in a way that controls for demographic factors. The raw well-being numbers, however, can be read from Table 1. Here our aim is to study the well-being of an unchanging representative citizen.

[6] Although for convenience the paper's prose refers to coefficients, what is meant throughout the paper is 'marginals' in the usual ordered-logit sense.

a statistically significant upward time trend in reported happiness. The concave shape in age disappears. The male dummy variable enters differently in columns 4 and 5; black men say they are happier than black women. Whites' happiness is trended strongly down over time—in the sense that the time trend's coefficient has a small standard error—in column 4 of Table 2A. Therefore, over the period, the gap between the well-being of American whites and blacks has narrowed.

The last two columns of Table 2A look at age. Older people, in column 7, have a clear downward movement in well-being. In column 8 the young are slightly up, by contrast, although the trend is not well-defined.

Table 2B changes from sub-samples with only exogenous characteristics. It reports regression equations for other sub-groups of the population (looking at categories that are endogenous and thus, to a large degree, chosen by the individuals). In columns 8–10, the downward time trend is greatest for those who are out of the labour force. The consistently large black dummy in columns 8–14 is noteworthy.

Columns 11 and 12 divide the sample into Americans who have small and large amounts of education. Interestingly, the size of the downward time trend is approximately the same in the two sub-groups. Conventional wisdom would not have predicted this; it is widely thought to have been a better era for the highly educated.

Columns 13 and 14 of Table 2B split the sample according to marital status—with the married as one category, while the other category combines the never married, those currently widowed or separated, and those divorced. In both columns, the time trend in happiness is positive. It is well-defined. This suggests that the statistical finding of a downward time trend in US happiness could be caused by a failure to distinguish between married and unmarried people. The decline of marriage in America—from 67% of adults in the mid 1970s to 48% by the late 1990s—may be one reason for the secular decline in happiness through the decades. But we show in the next section that this is probably not the full story.

These US equations[7] treat each person's reported happiness level as ordinal in much the way that economic theory's use of indifference curves does. Table 2A and B does not assume cardinal utility.

It is useful to check these patterns on another country. Although there are differences of detail, data from Great Britain give noticeably similar results. Here it is necessary to use a life-satisfaction question because there is no British happiness question over most of the required period. Questions about people's satisfaction with life seem of independent interest. Moreover, for the short run of years (1975–1986) over which both types of data are available, Appendix B confirms that the structures of happiness and life-satisfaction equations are similar.

The Eurobarometer Surveys provide cross-section information on ~55,000 Britons starting from the early 1970s (the annual sample is just over 2000 people). In each year

[7] These are, as explained, ordered logits. The usual approach in the psychology literature has been instead to assign numbers to happiness levels and then to use ordinary OLS regression methods. Strictly speaking, this is illegitimate (it cannot be assumed that 'very happy' equals, say, twice 'pretty happy'). Nevertheless, as shown in Appendix A, we have found that the simple method gives similar results to those from ordered logits.

Table 3
Life satisfaction equations for Great Britain, 1973–1998 (ordered logits)

(A)	(1) All	(2) Men	(3) Women	(4) Age <30	(5) Age ≥30
Time	0.0003	−0.0008	0.0012	−0.0041	0.0016
	(0.25)	(0.46)	(0.73)	(1.85)	(1.17)
Age	−0.0199	−0.0296	−0.0133	−0.2364	−0.0207
	(8.47)	(8.56)	(4.14)	(5.59)	(4.18)
Age^2	0.0003	0.0004	0.0002	0.0048	0.0003
	(10.17)	(10.66)	(4.50)	(5.06)	(5.59)
Male	−0.1159	n/a	n/a	−0.1878	−0.0909
	(7.13)			(5.95)	(4.79)
Cut1	−3.6440	−3.6528	−3.5787	−6.3655	−3.6004
Cut2	−2.1886	−2.2365	−2.0790	−4.8372	−2.1558
Cut3	0.4471	0.4569	0.5081	−2.0475	0.4129
N	56,863	27,082	29,781	15,546	41,317
χ^2	222.9	218.6	23.3	99.3	3165.7
Pseudo R^2	0.0019	0.0039	0.0004	0.0032	0.0019
LR	−59,263.6	−28,121.3	−31,098.1	−15,635.0	−43,567.9

(B)	(6) Working	(7) Unemployed	(8) OLF	(9) ALS ≤16	(10) ALS >16	(11) Married	(12) Not married
Time	0.0060	0.0279	0.0006	−0.0027	−0.0044	0.0057	0.0006
	(3.50)	(5.21)	(0.33)	(1.97)	(1.85)	(3.91)	(0.28)
Age	−0.0237	−0.0826	−0.0201	−0.0148	−0.0068	−0.0308	−0.0762
	(5.14)	(7.40)	(5.70)	(4.89)	(1.29)	(7.37)	(21.33)
Age^2	0.0003	0.0010	0.0002	0.0002	0.0002	0.0004	0.0008
	(5.47)	(7.77)	(6.28)	(6.94)	(3.15)	(9.09)	(21.23)
Male	−0.1220	−0.4305	0.0654	−0.0729	−0.2119	−0.2025	−0.0470
	(5.18)	(6.39)	(2.29)	(3.64)	(6.78)	(9.69)	(1.73)
Cut1	−4.0679	−3.1998	−3.5843	−3.3333	−3.7617	−4.0484	−4.4129
Cut2	−2.4787	−1.8115	−2.1487	−1.9195	−2.2136	−2.5793	−2.9563
Cut3	0.4233	0.5268	0.3622	0.6539	0.5571	0.1294	−0.3146
N	28,929	3548	22,367	37,168	15,645	35,181	21,354
χ^2	70.5	142.1	66.0	178.5	151.2	268.1	468.7
Pseudo R^2	0.0012	0.0161	0.0014	0.0022	0.0048	0.0038	0.0102
LR	−28,364.6	−4336.2	−23,564.4	−39,649.2	−15,532.9	−35,516.7	−22,806.2

t-Statistics are in parentheses. Source: Eurobarometer Survey series. ALS, age left school—individuals still in school at survey date excluded from columns 9 and 10. Columns 6–8 relate to 1975–1998 because labor force status is not defined consistently before 1975.

Eurobarometer and ICPSR study numbers and titles	
–	Cumulative file 1973–1992 (#9361)
34.1	Health problems, Fall 1990 (#9577)
37	Awareness of Maastricht and the future of the EEC, March–April 1992 (#9847)
37.1	Consumer goods and social security, April–May, 1992 (#9957)
38.1	Consumer protection and perceptions of science and technology, Nov. 1992 (#6045)
39	European Community policies and family life, March–April 1993 (#6195)
40	Poverty and social exclusion, October–November, 1993 (#6360)
41	Trade issues, blood donation, AIDS, and smoking, March–June 1994 (#6422)
42	The first year of the new European Union, November–December 1994 (#6518)
43.1	International trade and radiation protection, April–May 1995 (#6839)
44.2b	BIS mega survey policies & practices in building EU Jan–March 1996 (#6748)
44.3	Employment, unemployment and gender equality, February–April 1996 (#2443)
47.1	Images of Switzerland, education thru life, & work status, March–April 1997 (#2089)
49	Food product safety, child sex tourism, health care, & cancer, April–May 1998 (#2559)
	ICPSR study number in parentheses

they are asked: 'on the whole, are you very satisfied, fairly satisfied, not very satisfied, or not at all satisfied with the life you lead?' (Eurobarometer Survey Series).

The data come from the cumulative file and 13 other surveys. In a way reminiscent of the US happiness results, the lower half of Table 1 illustrates that in the early 1970s approximately a third of British people say they are 'very satisfied' with life. The number is unchanged by the late 1990s. Appendix C shows the equivalent for Europe.

Table 3A reports the same kinds of logit regression equations as for the US. Here life satisfaction is the dependent variable. It is not possible to include a dummy variable for race; but age, age squared, gender, and a time trend, are again used as regressors. Column 1 of Table 3A finds that well-being has not risen systematically in Great Britain from 1973 to 1998. Although the coefficient on time is positive, it is small and imprecisely estimated (the *t*-statistic is 0.25). British males are less content than females. Age enters in a convex way: well-being is U-shaped in years.

Columns 2–5 of Table 3A break the data into different sub-samples (males, females, young, old). None of these groups has a statistically significant time-trend in well-being. Although poorly defined, the trends on males and females go in the opposite way from the United States. There is a well-defined U-shape in age in each of the five sub-samples separately. Regardless of age group, columns 4 and 5 of Table 3A show that men report lower well-being scores.

Table 3B examines further sub-samples for Great Britain. For those in work, column 6 reveals that there is a statistically significant upward time trend in life satisfaction. Its coefficient is 0.006. There is no time trend among the out-of-the-labor-force group (the OLFs). Among the OLF individuals, men, who may be disproportionately the retired, are more satisfied than women. The age and gender variables continue to enter as before. Columns 9 and 10 separate into those people with low and high levels of education (ALS is 'age left school'); both have time trends that are down, and approximately at the border of significance at the 5% level.

An interesting finding in Table 3B is in columns 11 and 12. As was found for the United States, married people in Britain report secularly rising well-being over this quarter of a century. The coefficient is 0.0057 with a *t*-statistic of ~ 4. Unmarried people, by contrast, have a flat time-trend. The proportion of the sample who are married changes from 72% in the early 1970s to 55% by the late 1990s.

3. Happiness equations with a full set of controls

The next step is to explore the patterns in well-being data by allowing for a larger set of controls, and especially for the effects of income and other economic variables. Table 4 begins this. Using again pooled US data from the beginning of the 1970s, it estimates ordered logit happiness equations in which are included a time trend, age and age squared, dummies for demographic and work characteristics, years of education, and dummies for marital status (including whether the individual's parents were divorced). Sample size is $\sim 36{,}000$.

The first column of Table 4 continues to find a downward trend in American happiness. However, the coefficient on time is smaller than in Table 2, with a *t*-statistic of ~ 1.3. This

Table 4
Happiness equations for the United States, 1972–1998 (ordered logits)

	(1) All	(2) Men	(3) Women	(4) Blacks	(5) Whites
Time	− 0.0018	0.0045	− 0.0069	0.0092	− 0.0037
	(1.29)	(2.13)	(3.58)	(2.27)	(2.44)
Age	− 0.0220	− 0.0218	− 0.0223	− 0.0188	− 0.0252
	(5.53)	(3.42)	(4.35)	(1.70)	(5.78)
Age^2	0.0003	0.0003	0.0003	0.0004	0.0003
	(7.63)	(4.72)	(5.97)	(3.20)	(7.48)
Male	− 0.1595	n/a	n/a	0.0662	− 0.2142
	(6.78)			(1.03)	(8.29)
Black	− 0.4494	− 0.3336	− 0.5135	n/a	n/a
	(13.88)	(6.43)	(12.33)		
Other	− 0.0680	0.1602	− 0.2440	n/a	n/a
races	(1.08)	(1.70)	(2.90)		
Unemployed	− 0.8321	− 0.9713	− 0.6124	− 0.7923	− 0.8748
	(12.94)	(12.40)	(5.30)	(5.67)	(11.68)
Retired	− 0.0410	− 0.0362	− 0.0537	− 0.2742	− 0.0070
	(0.93)	(0.54)	(0.87)	(2.16)	(0.15)
Student	0.1245	0.0893	0.1654	− 0.2170	0.2015
	(1.92)	(0.91)	(1.90)	(1.38)	(2.73)
Keeping home	− 0.1045	− 0.5165	− 0.0803	− 0.2059	− 0.0905
	(3.26)	(3.14)	(2.31)	(2.52)	(2.55)
Other	− 0.6236	− 0.7287	− 0.5594	− 0.7283	− 0.6023
	(6.98)	(5.74)	(4.42)	(4.04)	(5.74)
≥ 2nd marriage	− 0.1063	− 0.0752	− 0.1348	− 0.1594	− 0.0916
	(2.86)	(1.41)	(2.60)	(1.35)	(2.31)
Widowed	− 1.1109	− 1.3076	− 1.0305	− 0.7139	− 1.1887
	(25.59)	(14.59)	(19.73)	(6.42)	(24.71)
Divorced	− 0.9874	− 0.9927	− 0.9757	− 0.8076	− 1.0027
	(27.17)	(16.82)	(21.04)	(8.37)	(24.98)
Separated	− 1.2523	− 1.2089	− 1.2513	− 0.8870	− 1.4194
	(20.69)	(11.86)	(16.60)	(8.48)	(18.25)
Never married	− 0.7384	− 0.7366	− 0.7381	− 0.5478	− 0.7466
	(22.40)	(15.44)	(15.93)	(6.38)	(20.30)
Parents divorced	− 0.1957	− 0.1250	− 0.2400	− 0.0554	− 0.2267
	(5.79)	(2.38)	(5.43)	(0.77)	(5.81)
Education	0.0482	0.0332	0.0646	0.0251	0.0570
	(13.03)	(6.44)	(12.11)	(2.45)	(13.91)
Cut1	− 2.4241	− 2.3900	− 2.2719	− 1.5238	− 2.5045
Cut2	0.5112	0.6154	0.6196	1.2283	0.4862
N	36,012	15,710	20,302	4795	30,153
χ^2	2960.7	1288.65	1748.9	276.0	2166.5
Pseudo R^2	0.0435	0.0439	0.0453	0.0295	0.0387
LR	− 32,515.0	− 14,043.8	− 18,426.9	− 4540.2	− 2690.6

Source: General Social Survey. t-Statistics are in parentheses. Education is years of schooling. 'Parents divorced' means 'when the respondent was aged 16, his or her parents had divorced'. '≥ 2nd marriage' means 'respondent is on his or her second, or later, marriage'. The base category is a white married female employee.

suggests that it is changes in factors such as marital status and working life that explain part of the downward movement in reported levels of contentment. The null hypothesis of no change over time cannot be rejected in column 1 of Table 4.

Looking across the columns, however, in this fuller specification it can be seen how different groups within the US economy have fared differently. Men's happiness has an upward trend in Table 4, column 2. Yet American women's well-being has fallen through the years. Blacks have trended up over time, with a large coefficient of 0.009. Whites' well-being has been down. Income is at this juncture deliberately omitted from this table—to allow changing real incomes to be absorbed into the time variable.

One of the interesting conclusions, from the economist's point of view, is how influential non-financial variables appear to be in human welfare. The new variables, in the lower half of Table 4, enter powerfully. Work and marital status variables have large and well-defined effects. The single greatest depressant of reported happiness is the variable 'separated'; this is closely followed by 'widowed'. Being unemployed is apparently almost as bad, and also has a small standard error. According to the estimates, the joblessness effect is close in size to the unhappiness associated with divorce.

Marital break-up features in two other ways in Table 4. Second and subsequent marriages appear from these estimates to be less happy than first marriages. This confirms a result in the psychology literature (for example, Diener et al., 1999). Moreover, a person whose parents were divorced (when the respondent was aged 16) has himself or herself a lower level of well-being in adulthood. It is not clear, of course, how much this kind of effect is truly causal. Genes rather than life events could be the explanation for such patterns in the data.

Years of education enter positively in a happiness equation. An economist might have guessed that this would occur—because schooling would act as a proxy for earnings. A later table, however, reveals that it cannot be an earnings effect of this sort. Education is playing a role independently of income. The exact effect of age upon reported happiness is of interest. It is U-shaped, in Table 4, with a minimum in the late 30s.

Further checks, not reported, found that the addition of dummy variables for the number of children had coefficients that were small and insignificantly different from zero. State dummies were sometimes statistically significant but left the structure of the equations unchanged. Being religious entered positively but did not affect other coefficients.

When confronted with well-being data, it is natural for an economist to ask whether richer people report greater levels of well-being. The idea that income buys happiness is one of the assumptions—made without evidence but rather for deductive reasons—in microeconomics textbooks.[8] To explore this, the trend is dropped, and replaced with year dummies (to pick up, among other things, the nominal price level). Table 5 is the result for the US. Income per capita in the household enters positively with a *t*-statistic exceeding 12. Because the data come in categorical bands, it is necessary to allocate midpoints and to adjust the top-codes through the period (details available on request). Interestingly, and perhaps surprisingly from an economist's point of view, the coefficients on the other variables in Table 5's well-being equations hardly alter. The amount of happiness bought

[8] An indirect utility function is of course increasing in income, and consumer theory can be done using revealed preference alone.

Table 5
Happiness equations for the United States, 1972–1998 (ordered logits)—year dummies included

	(1) All	(2) Men	(3) Women	(4) Blacks	(5) Whites
Age	− 0.0339	− 0.0325	− 0.0348	− 0.0211	− 0.0389
	(7.83)	(4.80)	(6.17)	(1.75)	(8.24)
Age^2	0.0004	0.0004	0.0004	0.0004	0.0005
	(9.30)	(5.67)	(7.30)	(2.96)	(9.37)
Male	− 0.1800	n/a	n/a	0.0238	− 0.2311
	(7.28)			(0.34)	(8.53)
Black	− 0.4227	− 0.3168	− 0.4926	n/a	n/a
	(12.14)	(5.74)	(10.92)		
Other races	− 0.0383	0.1890	− 0.2257	n/a	n/a
	(0.57)	(1.92)	(2.49)		
Unemployed	− 0.8029	− 0.9143	− 0.6097	− 0.7718	− 0.8334
	(11.83)	(11.13)	(4.92)	(4.98)	(10.67)
Retired	0.0075	0.0175	− 0.0023	− 0.2023	0.0378
	(0.16)	(0.25)	(0.03)	(1.46)	(0.74)
Student	0.1759	0.1550	0.1988	− 0.3113	0.2915
	(2.53)	(1.50)	(2.12)	(1.83)	(3.71)
Keeping home	− 0.0705	− 0.3840	− 0.0402	− 0.1484	− 0.0647
	(2.08)	(2.23)	(1.09)	(1.68)	(1.73)
Other	− 0.5496	− 0.6036	− 0.5269	− 0.7223	− 0.5249
	(5.67)	(4.44)	(3.77)	(3.58)	(4.66)
≥ 2nd marriage	− 0.1194	− 0.0954	− 0.1467	− 0.2078	− 0.1043
	(3.08)	(1.73)	(2.68)	(1.68)	(2.52)
Widowed	− 1.1465	− 1.3459	− 1.0536	− 0.7088	− 1.2412
	(24.50)	(14.14)	(18.59)	(5.93)	(23.90)
Divorced	− 1.0141	− 1.0984	− 0.9514	− 0.8110	− 1.0401
	(26.76)	(17.60)	(19.64)	(7.90)	(24.91)
Separated	− 1.2697	− 1.3478	− 1.1948	− 0.8828	− 1.4504
	(20.05)	(12.61)	(15.08)	(7.96)	(17.96)
Never married	− 0.7830	− 0.8192	− 0.5269	− 0.5805	− 0.8028
	(22.58)	(16.33)	(3.77)	(6.39)	(20.77)
Parents divorced	− 0.1932	− 0.1368	− 0.2300	− 0.0682	− 0.2255
	(5.49)	(2.52)	(4.97)	(0.90)	(5.57)
Education	0.0346	0.0203	0.0505	0.0142	0.0418
	(8.41)	(3.60)	(8.38)	(1.22)	(9.22)
Household income	0.0137	0.0140	0.0135	0.0126	0.0144
(per capita) × 10^3	(12.22)	(8.85)	(8.20)	(3.40)	(11.92)
Cut1	− 2.8198	− 2.8034	− 2.6304	− 1.3746	− 3.0106
Cut2	0.1494	0.2235	0.3048	1.4085	0.0188
N	32,825	14,608	18,217	4271	27,603
χ^2	2902.0	1304.4	1681.0	291.1	2188.0
Pseudo R^2	0.0470	0.0478	0.0487	0.0350	0.0428
LR	− 29,450.8	− 12,996.2	− 16,409.6	− 4016.6	− 24,452.2

Source: General Social Survey, ORC. t-Statistics are in parentheses. All equations include 19 year-dummies.

by extra income is not as large as some would expect. To put this differently, the non-economic variables in happiness equations enter with large coefficients, relative to that on income.

Table 5, or its ordinary least squares equivalent (see Appendix A), can be used to do a form of happiness calculus. The relative size of any two coefficients provides information about how one variable would have to change to maintain constant well-being in the face of an alteration in the other variable. To 'compensate' for a major life event such as being widowed or a marital separation, it would be necessary—this calculation should be treated cautiously but it illustrates the size of the coefficients—to provide an individual with ~$100,000 extra per annum.[9] Viewing widowhood as an exogenous event, and so a kind of natural experiment, this number may be thought of as the 'value' of marriage. Diener et al. (undated) contains complementary evidence about the psychological benefits of marriage in different countries.

A different interpretation of this type of correlation is that happy people are more likely to stay married. It is clear that this hypothesis cannot easily be dismissed if only cross-section data are available. However, panel data on well-being suggest that similarly large effects are found when looking longitudinally at changes (thus differencing out person-specific fixed effects). See, for example, Winkelmann and Winkelmann (1998). There is also a separate literature in which it is concluded that marriage seems to provide protection against depression and mental ill-health (a recent paper, with references, is Cochrane, 1996).

If high income goes with more happiness, and characteristics such as unemployment and being black go with less happiness, it is reasonable to wonder whether a monetary value could be put on some of the other things that are associated with disutility. Further calculation suggests that to 'compensate' men exactly for unemployment would take a rise in income of ~$60,000 per annum, and to 'compensate' for being black would take $30,000 extra per annum. These are large sums, and in a sense are a reflection of a low (happiness) value of extra income.[10]

British results are comparable. They are contained in Table 6. Here it is not possible to control as fully for income. However, the later columns of Table 6 incorporate an indicator of the family income quartile in which the individual falls.

Table 6 assumes that, apart from their income, a person's satisfaction with life depends upon a time trend, age and its square, gender, whether retired or keeping house or a student, work status, and marital status. A set of age-left-school dummies are also included to capture the individual's educational attainment. The time trend enters positively in column 1, with a coefficient of 0.0038 and *t*-statistic of 2.84. One interpretation of this is that well-being has been rising through the years in Great Britain—contrary to the United States. However, that would be somewhat misleading, because what is being measured is a ceteris paribus effect. It needs to be compared to the zero coefficient on time in Table 3A. The net effect of the variables listed in Table 6 is to remove the forces making for declining life satisfaction. In answering the question 'has Britain become more content?' it is therefore necessary to bear in mind the large rise in unemployment and fall in marriage.

[9] In 1990s dollars.

[10] It should be recalled that no trades are actually taking place, that budget constraints are not directly relevant in a simple sense, and that economists find these large partly because they are used to thinking, possibly incorrectly, of pecuniary factors as providing most of life's well-being.

Table 6
Life satisfaction equations for Great Britain, 1975–1998 (ordered logits)

	(1) All	(2) Men	(3) Women	(4) All	(5) Men	(6) Women
Time	0.0038	0.0063	0.0021	0.0066	0.0102	0.0038
	(2.84)	(3.26)	(1.13)	(4.16)	(4.40)	(1.72)
Age	− 0.0424	− 0.0486	− 0.0364	− 0.0432	− 0.0442	− 0.0406
	(13.21)	(10.09)	(8.41)	(11.11)	(7.58)	(7.75)
Age^2	0.0005	0.0006	0.0005	0.0006	0.0006	0.0005
	(15.38)	(11.50)	(10.12)	(13.10)	(8.86)	(9.38)
Male	− 0.1555	n/a	n/a	− 0.1404	n/a	n/a
	(8.27)			(6.12)		
Retired	− 0.0371	− 0.0090	− 0.0991	− 0.0186	0.0101	− 0.0945
	(1.18)	(0.20)	(2.20)	(0.50)	(0.19)	(1.75)
Keeping house	− 0.1257	− 0.7089	− 0.1139	− 0.1138	− 1.0668	− 0.0937
	(4.84)	(4.43)	(4.08)	(3.66)	(5.36)	(2.82)
Student	0.0141	− 0.0419	0.0918	− 0.0093	− 0.0764	0.1014
	(0.18)	(0.38)	(0.80)	(0.08)	(0.50)	(0.61)
Unemployed	− 1.1337	− 1.3774	− 0.7471	− 1.1705	− 1.4746	− 0.7008
	(30.89)	(29.86)	(12.12)	(24.70)	(24.85)	(8.66)
Married	0.3972	0.3268	0.4689	0.3998	0.3068	0.4981
	(14.43)	(8.63)	(11.45)	(12.05)	(6.85)	(9.81)
Living as married	0.0909	0.0043	0.1953	0.1200	0.0048	0.2512
	(1.76)	(0.06)	(2.61)	(1.95)	(0.06)	(2.80)
Divorced	− 0.6061	− 0.3565	− 0.7163	− 0.5525	− 0.3264	− 0.6135
	(12.32)	(4.61)	(11.03)	(9.54)	(3.60)	(7.95)
Separated	− 0.6531	− 0.7221	− 0.6004	− 0.5642	− 0.7201	− 0.4469
	(8.79)	(6.17)	(6.21)	(6.59)	(5.34)	(3.99)
Widowed	− 0.2894	− 0.3174	− 0.2004	− 0.2670	− 0.2823	− 0.1511
	(6.89)	(4.40)	(3.68)	(5.31)	(3.37)	(2.28)
Age left school dummies	12	12	12	9	9	9
Income quartiles	–	–	–	3	3	3
Cut1	− 3.7995	− 3.8290	− 3.6077	− 3.6261	− 3.6859	− 3.4083
Cut2	− 2.3024	− 2.3482	− 2.0882	− 2.1171	− 2.1822	− 1.8861
Cut3	0.4524	0.4818	0.6096	0.6425	0.6763	0.7977
N	54,549	25,959	28,590	37,726	18,428	19,298
χ^2	2912.9	1695.6	1316.7	2161.2	1283.5	1009.5
Pseudo R^2	0.0256	0.0314	0.0221	0.0275	0.0336	0.0249
LR	− 55,409.7	− 26,181.3	− 29,146.7	38,270.4	− 18,432.3	− 19,755.7

Source: Eurobarometer Survey series. t-Statistics are in parentheses. Notes: income quartiles have to be used because of the way in which the data are coded. Some sweeps have no income data, so the number of observations is lower than in earlier tables. The base category is an unmarried female who is an employee. The number of age-left-school dummies equals 12 in columns 1–3, and equals 9 in columns 4–6. This is necessary because of the way in which Eurobarometer 43.1—International trade and radiation protection: April–May 1995 (#6839) is coded.

The time trend for men in column 2 of Table 6 is larger than for women in column 3. Men appear to enjoy keeping house less than do women. Unemployment hits a male harder than it does a female. Women living as married are happier than those who are single, but markedly less than those who are legally married.

In Table 6, columns 4–6, it can be seen that the introduction of an independent variable for the person's income quartile affects other coefficients only a little. It continues to be true that joblessness hurts men more than women. The costs of unemployment are large relative to the costs from taking a cut in income. British men continue to be less contented than British women.

Table 7 sets out the British version of the United States equations of Table 4. The structure of the two is similar—despite the fact that the dependent variable is life satisfaction rather than happiness. Here a set of year-dummies controls for all macroeconomic changes in the British economy. The variables for income quartiles enter in a monotonic way: richer people are systematically more satisfied with their lives. In each of the three columns of Table 7, unemployment enters with a large negative coefficient. Men keeping house continue to be less satisfied with life.

The U-shape in age is again present in Tables 6 and 7. A notable feature is that the minimum is reached around the same age range for British men and women separately (37 in column 5 of Table 6 for men, and age 41 for women in column 6). Something systematic appears to be at work. No explanation is available even in the psychology literature. One tentative possibility is that this decline and then rise in well-being through the years may reflect a process of adaptation to circumstances; perhaps, by the middle of their lives, people relinquish some of their aspirations and thereby come to enjoy life more.

Some social scientists—prominently the economist James Duesenberry (1949) 50 years ago—have argued that human beings care mainly about relative, rather than absolute, income. For the United States, it is possible to use our data to explore the hypothesis that a person's position in the income distribution matters per se (and, potentially, to test whether this could help explain the lack of upward time-trend in well-being data). A related test by McBride (2001), done independently, was drawn to our attention after our paper was completed. Interesting papers by Hollander (2001), Ferrer-i-Carbonell (2002), Johansson-Stenman et al. (2002) and Senik (2002) have also recently appeared. Clark and Oswald (1998) show how concern for relative position generates imitative behaviour where people follow one another's actions.

Here we do a test in two ways. Firstly, in Table 8, the comparison income against which people judge themselves is defined to be the average income in the individual's state. When entered individually, in the third column of Table 8, the log state income per capita does enter, as the theory would predict, with a negative coefficient; but it is not especially well-determined. When a relative income variable is created—defined as the ratio of the individual's income to the state income per capita—it enters in the fourth column of Table 8 with a positive coefficient and large t-statistic. This is an intriguing finding. Relative income has some explanatory power in a happiness equation even when absolute income is held constant. However, this fact does not account for the whole of the puzzling time-series patterns in reported happiness. It can be seen from Table 8 that there continues to be a negative time trend. Much remains to be discovered in this area, and there are difficulties in knowing how to deflate nominal income levels, but our judgment is that a concern for relative income is not the whole explanation for the lack of upward movement in well-being numbers through the decades.

In columns 1 and 5 of Table 8, we check that the variable defined as 'household-income-per-capita' enters sensibly when broken down into its two constituent parts. It appears to do so.

Table 7
Life satisfaction equations for Great Britain, 1975–1998 (ordered logits)—year dummies included

	(1) All	(2) Men	(3) Women
Age	− 0.0424	− 0.0433	− 0.0402
	(10.91)	(7.41)	(7.66)
Age^2	0.0005	0.0006	0.0005
	(12.94)	(8.72)	(9.30)
Male	− 0.1411	n/a	n/a
	(6.14)		
Retired	− 0.0172	0.0103	− 0.0934
	(0.46)	(0.19)	(1.72)
Keeping house	− 0.1184	− 1.0712	− 0.0970
	(3.80)	(5.36)	(2.91)
Student	− 0.0175	− 0.0879	0.0870
	(0.16)	(0.57)	(0.52)
Unemployed	− 1.1798	− 1.4878	− 0.7196
	(24.83)	(24.91)	(8.86)
Married	0.3996	0.3053	0.4984
	(12.04)	(6.81)	(9.81)
Living as married	0.1155	0.0001	0.2464
	(1.88)	(0.00)	(2.74)
Divorced	− 0.5586	− 0.3387	− 0.6171
	(9.64)	(3.73)	(8.00)
Separated	− 0.5704	− 0.7177	− 0.4604
	(6.66)	(5.33)	(4.11)
Widowed	− 0.2675	− 0.2895	− 0.1500
	(5.32)	(3.45)	(2.26)
2nd Income quartile	0.0989	0.0564	0.1113
	(3.24)	(1.26)	(2.65)
3rd Income quartile	0.1563	0.0673	0.2112
	(5.08)	(1.50)	(4.94)
4th Income quartile	0.3219	0.3096	0.3199
	(10.67)	(6.93)	(7.72)
Age-left-school dummies	9	9	9
Year dummies	21	21	21
Cut1	− 3.5679	− 3.6124	− 3.3660
Cut2	− 2.0570	− 2.1071	− 1.8414
Cut3	0.7085	0.7585	0.8489
N	37,726	18,428	19,298
χ^2	2261.8	1339.7	1067.1
R^2	0.0287	0.0351	0.0263
LR	− 38,220.1	− 18,404.2	− 19,726.9

Source: Eurobarometer Survey series. Income quartiles have to be used because of the way in which the data are coded. t-Statistics are in parentheses.

One criticism deserves mention. It is possible that the relative income term in Table 8 is not picking up a comparison effect in the sense of Duesenberry and others, but rather, simply, that the cost of living varies by area and that the wage in the whole of a state is acting accidentally as a proxy for the consumer price level in that state. On this interpretation, our results would be consistent with normal textbook microeconomic

Table 8
Happiness equations with relative income for the United States (ordered logits)

Years	1972–1998	1972–1998	1972–1998	1972–1998	1972–1998	1972–1998	1972–1998	1980–1998
Log household income	0.2661				0.2155			
	(17.31)				(9.97)			
Log household income per capita		0.2209	0.2233	0.1723		0.1751	0.1349	0.1623
		(15.63)	(15.88)	(7.81)		(7.84)	(6.25)	(6.09)
Log state income per capita			−0.1449					
			(1.19)					
Relative income				0.0806	0.0888	0.0806	0.1253	0.1094
				(2.87)	(3.31)	(2.84)	(4.56)	(3.07)
Regional house price index							0.0003	
							(0.37)	
Household size	−0.0309				−0.0121			
	(3.59)				(1.17)			
Time trend	−0.0166	−0.0149	−0.0056	−0.0115	−0.0130			
	(9.67)	(8.76)	(0.70)	(5.59)	(6.40)			
State dummies (44)	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Year dummies (20)	No	No	No	No	No	Yes	Yes	Yes
Personal controls (19)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	32,751	32,751	32,751	32,751	32,751	32,751	32,751	22,761
χ^2	3121.4	3072.7	3071.44	3080.9	3134.9	3132.7	2997.1	32,190.8
Pseudo R^2	0.0506	0.0498	0.0498	0.0500	0.0508	0.0508	0.0486	0.0516

Notes: relative income term = household income per capita/state income per capita. In the first case, 'per capita' means per person in the household. Controls as in Table 5. Source of data on house prices: The Office of Federal Housing Enterprise Oversight's Repeat Sales House Price Index; this index measures changes in house values for single-family detached homes on which at least two mortgages were originated or subsequently purchased or securitized by Fannie Mae or Freddie Mae. Downloadable at http://www.huduser.org:80/periodicals/ushmc/winter99/histdat2.html. Source of data on state per capita income, US Dept. of Commerce, Bureau of Economic Analysis. Downloadable at http://www.bea.doc.gov/bea/regional/spi/.

theory, because it is real wages that enter utility functions. However, this appears not to be the correct interpretation. In the seventh column of Table 8, for instance, the relative income term continues to work well when a regional house price index (capturing the most notable reason why the cost of living varies by region) is included as an independent variable. Moreover, the coefficient on the regional house price index is itself insignificantly different from zero. As there are not good CPI numbers by US region, this is probably the closest that it is possible to come to a test.

In conclusion, these results give some support to the idea that relative income has an effect upon human well-being. In the happiness equations of Table 8, both income and relative income often enter within the same equation. Absolute income alone, therefore, does not capture all pecuniary effects.[11]

In a related spirit, Table 9 looks at an alternative way to define relative income. It varies the implicit comparison group. Table 9 takes a series of variables in which income is measured relative to the average level of income in each of the different quintiles of income within the person's state. Although it can only be suggestive, there is a little evidence here that the greatest effects come from the ratio of individual income to income in the 5th quintile (that is, the top income quintile). Adjusting for the different means—the mean of income relative to the first quintile is 2.46 while the mean of income relative to the fifth quintile is 0.18—suggests that the relativity effect is nearly twice as large at the high end of the income distribution. The point estimates are consistent with the idea that people compare themselves more with well-off families, so that perhaps they get happier the closer their income comes to that of rich people around them. But the standard errors are not sufficiently small to allow strong inferences to be drawn. There is some sign—see the negatives in Table 9—that individuals do not want to be far above the poorest people, that is, those in the bottom fifth of the income distribution. Although much remains to be understood, it may be that when people make relative-income comparisons they look primarily upward rather than downward.

4. Arguments and counter-arguments

Eq. (1) treats the subjectivity of responses as a component of the error term, but there still exist objections to the analysis.

Firstly, it is not possible to control here for person-specific fixed effects, or, in other words, for people's dispositions. Nevertheless, the data are random cross-sections, and therefore suitable for the estimation of time trends. What small amount of regression work has been done on panels, moreover, finds similar microeconomic patterns to those documented here (Clark and Oswald, 2002a).

Secondly, individuals are not randomly assigned to events like divorce, so the calculation of, for example, the value of marriage describes an association in the data rather than clear cause-and-effect (though treating widowhood as a natural, if melancholy, experiment seems to have some scientific merit even in our cross-section data). This is an

[11] We agree that, as a referee has suggested, people probably compare themselves more with their peers than with Bill Gates. Future work may find ways to construct 'local' measures of comparison income.

Table 9
Happiness equations with alternative relative-income measures for the United States (ordered logits)

Pooling years 1976–1996	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log income per capita	0.1962	0.1925	0.1867	0.1824	0.1788	0.1860	0.1840	0.1854
	(7.96)	(7.70)	(7.44)	(7.26)	(7.17)	(7.40)	(7.34)	(7.33)
Income/1st quintile state income	0.0138						−0.0594	
	(1.39)						(2.10)	
Income/2nd quintile state income		0.0425				−0.2717		−0.2778
		(1.55)				(2.53)		(2.51)
Income/3rd quintile state income			0.0869					
			(1.84)					
Income/4th quintile state income				0.1516				
				(2.06)				
Income/5th quintile state income					0.30961	0.6177	1.0710	1.6729
					(2.27)	(3.02)	(2.76)	(3.04)
Time	−0.0153	−0.0150	−0.0147	−0.0143	−0.0136	−0.0105	−0.0115	n/a
	(6.42)	(6.24)	(6.06)	(5.79)	(5.33)	(3.74)	(4.21)	
State dummies (44)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies (16)	No	No	No	No	No	No	No	Yes
Personal controls (19)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	26,219	26,219	26,219	26,219	26,219	26,219	26,219	26,219
χ^2	2345.9	2346.4	2347.4	2348.2	2349.1	2355.5	2353.3	2403.9
Pseudo R^2	0.0478	0.0478	0.0478	0.0479	0.0479	0.0480	0.0480	0.0490

Notes: controls as in Table 5. Mean quintile state income data obtained from the CPS and provided to us by Tim Bartik.

important problem. In the generic sense it is of course common throughout applied economics. The pragmatic response, here and elsewhere, is that at this point in the history of economic research it is necessary to document patterns and to be circumspect about causality. As explained earlier, marriage is believed by psychologists and psychiatrists to provide a protective effect to mental well-being (Argyle (1989) contains further discussion of the evidence), but unambiguous proof would perhaps require a sharper statistical test than is possible with these data. Similarly for income: people may earn more than average because they are cheerier than average.

Thirdly, people in the early 1970s may have used words differently from those in 1998 (so 'happy' no longer means exactly the same, perhaps). This is not immediately plausible; it would be more so over a century. Nevertheless, in so far as it holds, the paper's approach would be open to doubt, although the cross-section regression patterns would continue to be immune as long as year-dummies accurately captured the change-in-language effect as a set of intercept shifts.

Fourthly, 'satisfaction' scores, as here for the British data set, may be inherently untrended—perhaps because people unknowingly anchor their language on an observed aspiration level and adjust accordingly through the years. If true, this would create difficulties for some of the time-trend conclusions for Britain. But the cross-section findings would hold, and the US happiness results would go through.

Fifthly, could the time-series patterns and the U-shape in age simply be cohort effects? In other words, it might be that, perhaps because of the influence of the Second World War, people born in different age-cohorts have different attitudes and dispositions. For the U-shape specifically, it is straightforward to show that that cannot be the whole answer. A well-being U-shape in age continues to exist in General Social Survey cohorts who were born many years apart. There is some indication that the age for the turning point is a little older among later cohorts, but the well-determined convex shape is robust. The broader idea that the lack of an aggregate time-trend is specific to these particular post-war generations may turn out to be true. It is currently untestable. Until many more decades of data are available, it must remain a possibility.

Sixthly, a referee has encouraged us to accept that rising living standards unambiguously produce good things—lower infant mortality, less serious illness, cleaner environments. We agree. Nevertheless, the intriguing lack of an upward trend in happiness data deserves to be confronted by economists.

Finally, this paper's analysis is not an attempt to define 'utility' in a single and exact empirical way. Nevertheless, the philosophy underlying the paper is that subjective well-being data may be useful to economists (just as such statistics have to psychologists).

5. Conclusions

This paper explores the economics of happiness. It estimates micro-econometric well-being equations. Reported levels of happiness have been dropping through time in the United States. Life satisfaction has run approximately flat in Great Britain. In a

period of increasing material prosperity—our data cover the period from the early 1970s to the late 1990s—these results may surprise some observers.

Easterlin (1974, 1995) argued that economic growth does not bring happiness to a society. Our data begin around the time of his original article's publication, and this paper provides some support, a quarter of a century later, for Easterlin's views. Nevertheless, the picture is not a simple one. Some groups in society—such as American men and blacks—have become happier through the decades. Moreover, once the British equations control for enough personal characteristics (including whether unemployed or divorced), there is some evidence of a statistically significant upward movement in well-being since the 1970s.

Our other main findings are the following.

1. Whatever the consequences of anti female-discrimination policy elsewhere in society, it has apparently not been successful in either country in creating a feeling of rising well-being among women.
2. Black people in the US appear to be much less happy, ceteris paribus, than whites. One interpretation of this is that our methods provide a new way to document the existence of discrimination.
3. The difference in the well-being of racial groups in the United States has narrowed over the last few decades. Blacks have made up ground.
4. Our calculations suggest that to 'compensate' men for unemployment would take a rise in income at the mean of ~ $60,000 per annum, and to 'compensate' for being black would take $30,000 extra per annum. A lasting marriage is worth $100,000 per annum (when compared to being widowed or separated). Because there appears to be little precedent for such calculations in the published social science literature, they should be treated with care.
5. Higher income is associated with higher happiness.
6. Relative income matters per se.
7. Reported well-being is greatest among women, married people, the highly educated, and those whose parents did not divorce. It is low among the unemployed. Second marriages are less happy.
8. Happiness and life satisfaction are U-shaped in age. In both Britain and the US, well-being reaches a minimum, other things held constant, around the age of 40.

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Appendix A. A check on an OLS form of equation

If a simple ordinary least squares happiness regression is estimated, using the US General Social Survey, it produces the following equation. The means are as stated. The dependent variable is constructed by assigning 3 to very happy, 2 to pretty happy, and 1 to not too happy. There is then an implicit assumption of cardinality.

The coefficients on the independent variables include (with *t*-statistics in parentheses):

Age	− 0.0103 (7.90)
Age squared	0.0001 (9.33)
Male	− 0.0537 (7.11)
Time	− 0.0027 (5.53)
Black	− 0.1286 (12.47)
Other	− 0.0147 (0.73)
Second marriage	0.0403 (3.43)
Widowed	− 0.3060 (18.07)
Divorced	− 0.2702 (18.38)
Separated	− 0.3439 (16.40)
Never married	− 0.1984 (13.78)
Per capita income	0.00000409 (12.06)
Unemployed	− 0.2444 (12.13)
Retired	− 0.0019 (0.13)
Keeping house	− 0.0234 (2.26)
Student	0.0499 (2.38)
Other work status	− 0.1684 (5.85)
R^2	0.0845
$F(19, 32805)$	159.4
Root MSE	0.6038

The omitted base case is married, white, female, and employed

Total number of observations	32,825
Mean of the dependent happiness variable	2.2
Mean of the income variable in dollars	11,236
Income in 1973	4261
Income in 1983	10,457
Income in 1998	20,457

Appendix B. Comparing happiness and life satisfaction equations where data on both are available

GB Eurobarometers, 1975–1986

	Happiness	Life satisfaction
Age	− 0.0456 (6.93)	− 0.0314 (4.83)
Age^2	0.0005 (7.51)	0.0004 (6.20)
Male	− 0.1921 (4.89)	− 0.1494 (3.85)
ALS 15	0.1161 (2.12)	0.1389 (2.56)
ALS 16	0.2449 (4.19)	0.2390 (4.15)
ALS 17	0.1941 (2.58)	0.2708 (3.65)
ALS 18	0.3145 (3.78)	0.2868 (3.47)
ALS 19	0.3944 (2.78)	0.5313 (3.82)
ALS 20	0.0131 (0.08)	0.4512 (2.78)
ALS 21	0.3350 (3.12)	0.5964 (5.68)
ALS $\geq$ 22	0.1789 (1.97)	0.5561 (6.21)
Still studying	0.1949 (1.22)	0.2687 (1.69)
Married	0.4121 (7.14)	0.1262 (2.20)
Living together	− 0.1136 (0.76)	− 0.1562 (1.06)
Divorced	− 0.4553 (4.02)	− 0.7834 (7.00)
Separated	− 0.5247 (3.15)	− 0.6663 (4.03)
Widowed	− 0.4326 (5.09)	− 0.6305 (7.41)
Retired	− 0.0071 (0.10)	0.1232 (1.80)
Housewife	− 0.1421 (2.87)	− 0.0409 (0.83)
Student	− 0.0929 (0.66)	− 0.0701 (0.50)
Unemployed	− 0.9868 (11.67)	− 1.4061 (16.73)
Cut1	− 2.3649	− 3.7574
Cut2	0.4567	− 2.2476
Cut3		0.5135
N	14,114	14,114
χ^2	508.66	681.7
Pseudo R^2	0.0189	0.0232
Log likelihood	− 13,201.3	− 14,334.6

Source: Eurobarometer Cumulative File (ICPSR #9361).

Appendix C. Life-satisfaction means for Europe

The level of life satisfaction in Europe as a whole also appears to have been roughly constant over time. According to the Eurobarometer surveys, the means (weighted by their relative sizes) to the life satisfaction question referred to in the paper for the first 12

members of the EU (France, Belgium, Netherlands, West Germany, Italy, Luxembourg, Denmark, Ireland, UK, Greece, Spain, Portugal) were as follows:

	1973	1983	1997
Not at all satisfied	4%	6	5
Not very satisfied	16	16	17
Fairly satisfied	58	59	59
Very satisfied	22	19	19

Source: Eurobarometers cumulative file (ICPSR # 9361) for 1973 and 1983 and Eurobarometer #47.1 (ICPSR #2089) for April 1997.

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