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The curved relationship between subjective well-being and age

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Abstract

This article is concerned with a body of work on happiness and age represented by important papers such as Mroczek and Kolarz (1998) and Mroczek and Spiro (2005). Using a large British data set, the paper presents new longitudinal evidence. It also points out that, perhaps unknown to many psychologists, a parallel literature on this topic exists in economics journals. The paper shows that subjective well-being follows a U-shape through the life course. We argue that eventually the two literatures will have to be made consistent with one another, and suggest that, although it is not easy to live in both worlds, with their different styles and conventions, economists and psychologists still have much to learn from one another.

Keywords: Happiness; ageing; well-being

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The Curved Relationship Between Subjective Well-Being and Age

The relationship between happiness and age is important but still imperfectly understood. On page 1336 of an interesting article in this journal, Mroczek and Kolarz (1998) state that, to their knowledge, "no previous study has considered the possibility of nonlinear relationships between age and happiness." A follow-up study by Mroczek and Spiro (2005) is in the same spirit but uses different methods. The former article finds that positive affect has an upwardly curved component; the latter suggests that subjective well-being follows an inverted U-shape and peaks at around age 60. On our reading of these two papers, they are important work. They are currently acquiring high numbers of citations in the Social Science Citation Index. A literature in psychology journals is growing up around them.

We present new longitudinal evidence on this issue. Its chief finding does not seem to exist in the psychology journals. A second aim of our article is to alert psychologists to a parallel literature on the nonlinear relationship between happiness and age. It is research published mainly in economics journals. This stream of work may have originated from Clark and Oswald (1994). Using a 12-item measure of psychological well-being, and a cross-section of 6100 randomly sampled Britons from the first wave of the British Household Panel Survey, that paper found mental well-being to be U-shaped in age. The authors' data were for 1991. The paper drew the conclusion that the happiness minimum along the U is reached around a person's mid-30s.

Since then, a body of work by economists and statisticians has suggested, across a range of settings, that the relationship between subjective well-being and age is curved. Almost every study replicates the basic conclusion: that happiness is U-shaped in age, with a minimum

point in a range from the mid-30s to approximately the late-40s. The result has now been demonstrated for perhaps fifty nations. It has been found especially in data from Western countries such as the United States, the United Kingdom, Australia, France, Italy, Belgium, Germany, Spain, and Switzerland.

The U-shape in age is documented in, for example, Gerlach and Stephan (1996), Oswald (1997), Theodossiou (1998), Winkelmann and Winkelmann (1998), Di Tella et al (2001), Frey and Stutzer (2002), Helliwell (2003), Blanchflower and Oswald (2004), Graham (2005), Frijters et al (2004, 2005), Senik (2004), Van Praag and Ferrer-i-Carbonell (2004), Clark (2005), Long (2005), Shields and Wheatley Price (2005), Propper et al (2005), Powdthavee (2005), Bell and Blanchflower (2006), and Uppal (2006). Blanchflower (2001) documents the U-shape in 23 East European transition nations. Di Tella et al (2003) provides the same for 12 separate Western industrial nations. Clark et al (1996) makes a similar argument for job satisfaction equations, and also gives some results for mental well-being equations. Recently, Blanchflower and Oswald (2006), using data on approximately half a million Europeans and Americans, argues that allowance for the inclusion of cohort effects makes little difference to the finding of a U-shape.

These papers' methods vary slightly. Nevertheless, each of them, as in the work of Mroczek and Kolarz (1998), draws upon multiple-regression models. In this way, factors other than age are held constant.

We here report briefly an updated version of the results of Clark and Oswald (1994). Since then, the British Household Panel Survey has happened annually, so it is possible to re-do those calculations on a longitudinal data set now exceeding 100,000 observations. A new

test can now be done, in which both fixed-effects and age can be allowed for in a multiple regression equation framework.

One variable we use is life satisfaction. It is measured on a seven point scale from 1 (not satisfied at all) to 7 (completely satisfied). Over all 14 waves of the BHPS, this has a mean of 5.19 with standard deviation 1.26.

Another is a General Health Questionnaire (GHQ) score. This is a questionnaire-based method of measuring psychological well-being and has been used widely in the health and epidemiological research literature (for recent examples, see Cardozo et al 2000, Martikainen et al 2003, and Pevalin and Ermish 2004). It amalgamates answers to the following list of twelve questions:

Have you recently:

1. *Been able to concentrate on whatever you are doing?*
2. *Lost much sleep over worry?*
3. *Felt that you are playing a useful part in things?*
4. *Felt capable of making decisions about things?*
5. *Felt constantly under strain?*
6. *Felt you could not overcome your difficulties?*
7. *Been able to enjoy your normal day-to-day activities?*
8. *Been able to face up to your problems?*
9. *Been feeling unhappy and depressed?*
10. *Been losing confidence in yourself?*
11. *Been thinking of yourself as a worthless person?*
12. *Been feeling reasonably happy all things considered?*

Responses are made on a four-point scale of frequency of a feeling in relation to a person's usual state: "Not at all", "No more than usual", "Rather more than usual", and "Much more than usual".

The between-item validity of the GHQ-12 is high in the BHPS, with a Cronbach alpha of 0.89. For simplicity, we use the so-called Caseness GHQ score, which counts up the number of questions for which the response is in one of the two "low well-being" categories. This count is then reversed, to convert it into a well-being rather than ill-being score, which thus runs from a possible low of 0 (all twelve responses indicating poor psychological health) to a high of 12 (no responses indicating poor psychological health). The well-being GHQ measure has mean of 10.14 and standard deviation of 2.92.

Life-satisfaction and GHQ measures of subjective well-being seem valuably complementary. They capture different aspects of affect. However, as we show below, the two exhibit a similar pattern over the life course.

Although the size of the BHPS data set has expanded since the initial research was done, and it is now possible to control for people's unchanging dispositions (fixed effects), the main conclusion remains approximately the same as in the simpler evidence of Clark and Oswald (1994). Both wellbeing-GHQ and life satisfaction are U-shaped across age groups. In the full longitudinal data set here from 1991 to 2004, it reaches a minimum in the age range 40-49, which is a little later than the early estimate that came out of our single-year of 1991 data. The coefficients on the other age-bands reveal a fairly smooth curve -- down and then up -- through the lifespan. This finding is not sensitive to the exact specification of the well-being equations. The pattern in the raw data is illustrated in Figure 1 for the latest wave at our

disposal, which is 2004. As is clear from the Figure, it is not necessary to use regression equations to see the approximate U-shape across age-groups.

It is known that many variables shape subjective well-being (Diener et al 1999, Easterlin 2003, Lucas et al 2004, and Gilbert 2006). If we control in the regression equations for region, year, income, the work status of the individual (ie. whether employee, self-employed, unemployed, retired from work), the number of children, gender, marital status, whether a renter or home-owner, the level of education, and subjective physical health, then, once again, well-being reaches a minimum in the age band 40-49.

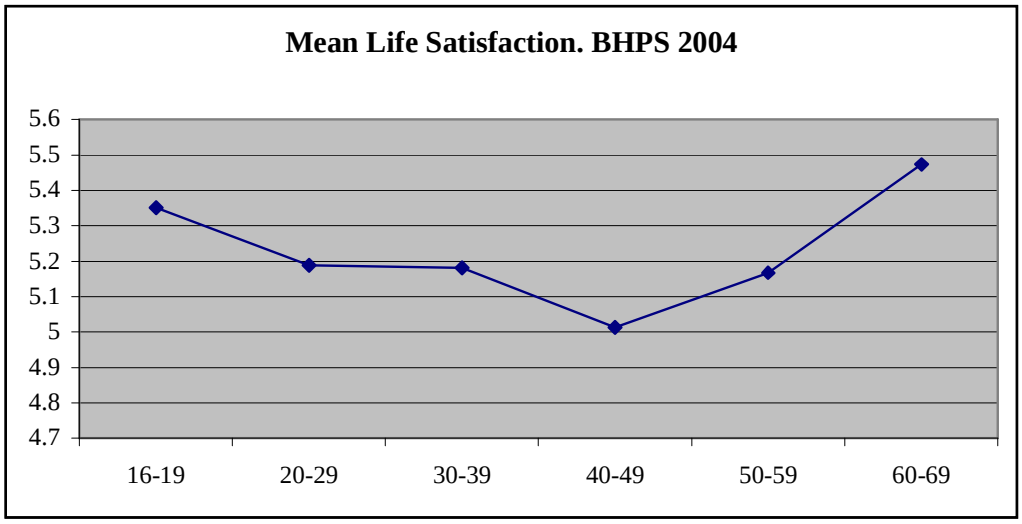
For the formal analysis, as say reported using simple methods in Table 1, it makes no substantive difference whether we use logistic regression or simple methods like Ordinary Least Squares (OLS), or random-effects or fixed-effects models. The third column of Table 1 follows the same individuals through time -- annually from 1991 to 2004 -- whilst holding constant their unchanging fixed-effects, and allowing for many other characteristics such as marital status. By using banded age dummy-variables, in a way that to our knowledge has not been done before in longitudinal work of this sort, in either the psychology or economics literatures, Table 1 provides clear evidence of a U-shape.

Our finding of a U-shape using longitudinal data does not appear to exist in the psychology literature. It is not clear why the results of this economics research literature differ in some significant ways from, say, those in Mroczek and Spiro (2005), which finds almost the reverse -- an inverted U-shape in age. It seems important that future work explore these interesting issues more fully. A deeper theoretical understanding of the empirical happiness-age curve will also be required.

Psychologists were working on well-being data some decades before researchers in economics (Bradburn 1969, Diener 1984). We hope, nevertheless, that this short article might be a useful guide to economists' writings on happiness and age.

Over recent decades, economists -- including ourselves -- have been guilty of not reading the psychology journals sufficiently. Psychologists, similarly, may not have read the economics journals as much as might be ideal. Despite the methodological differences, both sides would, arguably, benefit if we could learn to communicate more effectively.

Figure 1. Mean Life-Satisfaction and Wellbeing-GHQ in British Data. BHPS Wave 14 (2004)



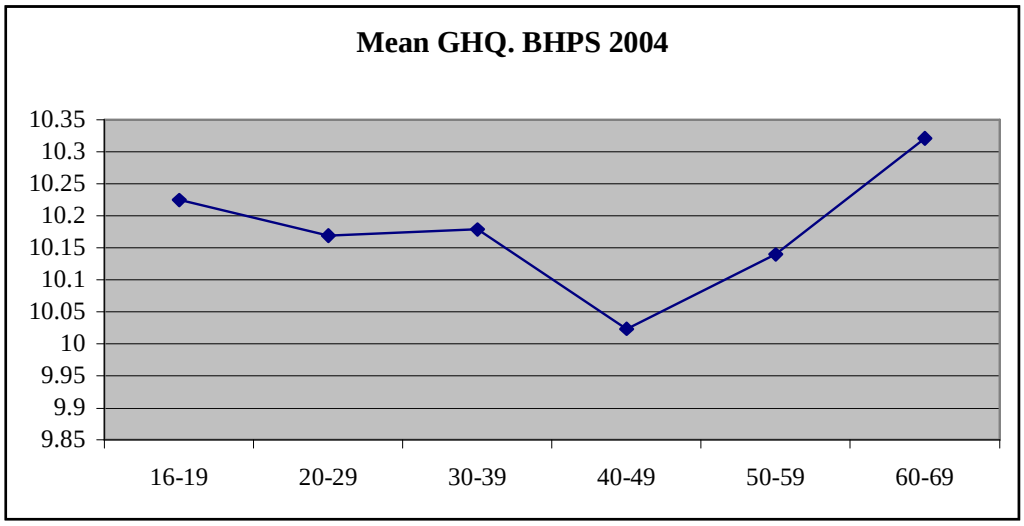


Table 1. Well-Being Regressions. BHPS Waves 1-14.

Life Satisfaction

	No controls	*Demographic controls*	*Demographic controls plus Individual Fixed Effects*
Age 20-29	-0.154**	-0.230**	-0.161**
	(0.021)	(0.023)	(0.025)
Age 30-39	-0.224**	-0.380**	-0.170**
	(0.023)	(0.029)	(0.034)
Age 40-49	-0.315**	-0.487**	-0.187**
	(0.024)	(0.031)	(0.042)
Age 50-59	-0.155**	-0.334**	-0.165**
	(0.026)	(0.032)	(0.050)
Age 60-69	0.188**	-0.053	-0.061
	(0.028)	(0.038)	(0.059)
Constant	5.339**	5.023**	4.938**
	(0.019)	(0.036)	(0.496)
Observations	90567	87797	87797
R-squared	0.014	0.146	0.025

GHQ

	No controls	*Demographic controls*	*Demographic controls plus Individual Fixed Effects*
Age 20-29	-0.093**	-0.223**	-0.228**
	(0.036)	(0.040)	(0.045)
Age 30-39	-0.248**	-0.399**	-0.374**
	(0.042)	(0.053)	(0.064)
Age 40-49	-0.347**	-0.452**	-0.464**
	(0.045)	(0.057)	(0.081)
Age 50-59	-0.228**	-0.186**	-0.314**
	(0.048)	(0.059)	(0.099)
Age 60-69	0.157**	0.197**	-0.106
	(0.049)	(0.067)	(0.119)
Constant	10.265**	9.204**	9.625**
	(0.032)	(0.067)	(1.247)
Observations	145424	141875	141875
R-squared	0.003	0.119	0.032

Notes. The omitted age band is 16-19 years old. Standard errors in parentheses. * significant at 5%; ** significant at 1%. The controls in columns 2 and 3 are for income, labour force status, number of children, sex, marital status, education, health,and wave and regional dummies.

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