

Headey, Bruce; Muffels, Ruud; Wagner, Gert G.

**Working Paper**

## Choices which change life satisfaction: Revising SWB theory to account for change

IZA Discussion Papers, No. 4953

**Provided in Cooperation with:**

IZA – Institute of Labor Economics

Suggested Citation: Headey, Bruce; Muffels, Ruud; Wagner, Gert G. (2010) : Choices which change life satisfaction: Revising SWB theory to account for change, IZA Discussion Papers, No. 4953, Institute for the Study of Labor (IZA), Bonn

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Revising SWB Theory to Account for Change**

Bruce Headey  
Ruud Muffels  
Gert G. Wagner

May 2010

# Choices Which Change Life Satisfaction: Revising SWB Theory to Account for Change

**Bruce Headey**

*University of Melbourne  
and DIW Berlin*

**Ruud Muffels**

*Tilburg University*

**Gert G. Wagner**

*DIW Berlin, Max Planck Institute for Human Development,  
Berlin University of Technology and IZA*

Discussion Paper No. 4953  
May 2010

IZA

P.O. Box 7240  
53072 Bonn  
Germany

Phone: +49-228-3894-0  
Fax: +49-228-3894-180  
E-mail: [iza@iza.org](mailto:iza@iza.org)

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## ABSTRACT

### Choices Which Change Life Satisfaction: Revising SWB Theory to Account for Change<sup>\*</sup>

Using data from the long-running German Socio-Economic Panel (SOEP) 1984-2008, this paper analyses the effects of individual preferences and choices on subjective well-being (SWB). It is shown that preferences and choices relating to life goals/values, partner's personality, hours of work, social participation and healthy lifestyle all have substantial effects on life satisfaction. The results have negative implications for the still dominant theory of SWB, *set-point theory*. This theory holds that adult SWB does not change in the medium or long term, although temporary fluctuations occur due to specific life events. Set-point theory has come under increasing criticism in recent years, primarily due to unmistakable evidence in SOEP that, during the last 25 years, up to a third of the population has recorded substantial and apparently permanent changes in life satisfaction. It is becoming clear that the main challenge now for SWB researchers is to develop a new theory which can account for medium and long term change, and not merely stability in SWB. Set-point theory is limited precisely because it is purely a theory of stability. The paper is based on a specially constructed SOEP file in which data are divided into five 5-year periods in order to facilitate analysis of medium term change.

JEL Classification: I31, J1, Z13

Keywords: SWB, set-point theory, life goals, individual choice, panel regression analysis, SOEP

Corresponding author:

Gert G. Wagner  
DIW Berlin  
10108 Berlin  
Germany  
E-mail: [gwagner@diw-berlin.de](mailto:gwagner@diw-berlin.de)

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<sup>\*</sup> We would like to thank Ed Diener of the University of Illinois and Alex Wearing of Melbourne University for constructive comments on an earlier draft.

The focus of this article is on individual preferences and choices – relatively unconstrained choices - which make a substantial difference to life satisfaction. These choices relate to (1) life goals/values (2) the personality of the partner one lives with (3) hours of work (4) social participation and (5) healthy lifestyle. If it can be shown that these choices are consequential, the results will have major implications for the currently dominant theory of subjective well-being (SWB), *set-point theory*. Set-point theory holds that adults have more or less fixed levels of SWB, which depend on genetic factors, including personality traits (Brickman and Campbell, 1971; Headey and Wearing, 1989; Lykken and Tellegen, 1996). It is accepted that major life events (viewed as exogenous shocks) can produce temporary fluctuations in SWB, but the theory predicts, and it has been convincingly demonstrated, that following most events most individuals revert within a year or two to their previous set-point (for an up-to-date review see Clark, Diener and Lucas, 2008). An obvious and major implication of set-point theory is that individual choices cannot possibly make a substantial difference to SWB.

In analysing data from the German Socio-Economic Panel (SOEP: 1984-2008), our strategy will be to show that individual choices matter, controlling for fixed genetic and personality factors which set-point theory highlights and which must clearly be regarded as causally antecedent to choices which individuals make. The panel data allow us to analyse the extent to which, net of personality traits, *changes* in individual choices in 1984-2008 have been associated with *changes* in SWB. The sample comprises prime age adults (25-64); precisely the group whose SWB set-points are not supposed to change.

In the last few years there have been several critiques and attempts to revise set-point theory, which have exposed its serious limitations (Easterlin, 2005; Diener, Lucas and Scollon, 2006; Headey, 2006, 2008ab). Set-point theory is purely a *theory of stability*. It depends on finding or assuming that adult SWB is stable. Until the German panel data became available, long term stability had never been *directly* tested. In practice it was just

inferred from observations of the short-lived effects of life events, from personality studies, twin studies and relatively short term SWB panels (Brickman and Campbell, 1971; Headey and Wearing, 1989; Lykken and Tellegen, 1996). But the German data have now shown that assumptions and inferences about stability can no longer be maintained (Fujita and Diener, 2005; Headey, 2006, 2008a; Diener and Diener, 2008). It appears that in the last 25 years over 30% of the panel have recorded changes in their life satisfaction of one standard deviation or more (Headey, 2006, 2008a). Changes of this magnitude recorded by a substantial segment of the population cannot be reconciled with set-point theory as currently understood.

So the research challenge now is to develop a new theory, which accounts for change as well as stability. It seems to be the case, at least in Germany, that a majority of people maintain fairly stable set-points.<sup>1</sup> But SWB theory also needs to account for the large minority whose set-points change. To be more exact, the focus needs to be on *medium and long term change*; we already know that temporary fluctuations are caused by life events.

Before discussing hypotheses about the causes of medium term change, it is important to record some additional limitations of set-point theory highlighted by recent research and reviews. Despite occasional claims that genetic factors account for almost all the variance in SWB (e.g. Lykken, 1999), most reviews conclude that only about 50% of the variance can be accounted for (Huppert, 2005; Lucas, 2008). To put this another way, it is clear that many people who appear to have just the 'right' kind of personality to rate high on life satisfaction (e.g. they rate high on extroversion and low on neuroticism) are in fact in the bottom half of the distribution, and many individuals with apparently unfavourable personality traits are high in the distribution (Diener and Diener, 2008; Headey, 2006).

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<sup>1</sup> Even this degree of stability might not hold in a country with a more turbulent recent history. In the period in question *West* Germany experienced neither war nor a major economic recession.

Ed Diener and colleagues have repeatedly sought to explain changes in SWB by tracking the effects of a range of life events on the time profile of SWB scores; scores before, close to and after the event (Lucas, Clark, Georgellis and Diener, 2003; Clark, Georgellis, Lucas and Diener, 2004; Clark, Diener and Lucas, 2008). They have drawn somewhat varying conclusions from this research. Their latest comprehensive assessment is that only one fairly common event, unemployment, especially if persistent or repeated, can be shown to have a long term effect on SWB (Clark, Diener and Lucas, 2008). Earlier they had reported that several other events, notably getting married and becoming widowed, appeared to have long term effects on some individuals, although not all (Lucas, Clark, Georgellis and Diener, 2003). Currently, however, the conclusion being drawn, or perhaps left open to inference, is that because most life events – events which one would think of as major landmarks in a person’s life - do not produce lasting change in SWB, then set-point theory does not need serious revision (Clark, Diener and Lucas, 2008). This seems dubious. Based on the German panel evidence, the current state of play is surely that we know that substantial medium and long term changes in SWB do occur, but attempts to explain these changes in terms of one-off life events have largely failed.

So what else might account for persistent change? Richard A. Easterlin (2005), in a wide-ranging literature review, marshalls evidence to show that persistent change is quite likely to occur in the health and family domains, but not in the financial domain. The evidence relating to health, and specifically to *chronic conditions* (as opposed to one-off health events) is particularly convincing. Late onset health conditions, including type 2 diabetes and arthritis, appear to permanently lower SWB (Mehnert et al, 1990). This is not to deny that partial adaptation/habituation occurs, but complete adaptation does not. Easterlin’s view that chronic conditions, as distinct from one-off events, may help to account for change is congruent with the well established finding that parents never fully recover from the untimely death of a child; the chronic condition here being unresolved grief (Wortman and Silver, 1987).

In searching for other factors which might account for persistent change in the German data, Headey (2006) found that individuals with certain personality traits appear more

open to long term change than others. Highly extroverted people are more likely to have recorded long term gains in life satisfaction, and more neurotic people are more likely to have sustained long term losses. The mechanisms are far from certain. It is known that extroverted people are more likely to perceive and record positive experiences than introverts and also tend to react more strongly in a positive direction to those experiences (Larsen and Ketelaar, 1991; Rusting and Larsen, 1997; Lucas and Baird, 2004). In parallel fashion, individuals who rate high on neuroticism perceive and record more negative experiences and react worse to them than most other people (Larsen, 1992). What remains unknown, however, is why (if it is true) some individuals with these traits record persistent changes in SWB, rather than reverting to their previous set-points.

This paper extends previous research on the significance of life goals/values for SWB. Several papers have shown that giving top priority to material goals/values is inimical to happiness (Nickerson et al, 2003; Diener and Seligman, 2004; Kasser and Kanner, 2004). Experimental and survey evidence indicates that people who spend more money on others and relatively less on themselves have higher life satisfaction (Dunn, Aknin and Norton, 2008). Headey (2008b) reported that individuals who give relatively high priority to social, altruistic goals and family (quality of relationship) goals, and lower priority to material and career goals, are more satisfied with life initially and that this difference increases over time (see also Emmons, 1986). These results held, controlling for the effects of personality traits. Several studies have indicated that volunteering, engaging in altruistic community activities and repeatedly carrying out ‘good deeds’ are associated with higher SWB (Harlow and Cantor, 1996; Thoits and Hewitt, 2001; Lyubomirsky, 2008).

In trying to explain why people who give priority to social/altruistic and family goals appear more satisfied than those who prioritise material and career goals, Headey (2008b) suggested that a key distinction may lie between zero sum and non-zero sum goals.<sup>2</sup> Generally speaking, material and career goals (also status goals) are zero sum. They can

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<sup>2</sup> See also Hirsch (1976) and Frank (1985) who make a similar distinction between positional and non-positional goods.



only be pursued at the expense of someone else; ‘my gain is your loss’. It follows that there are bound to be many losers and that almost all those who win in round 1 will lose in round 2 or later rounds. So, on average and for most people, prioritising zero sum goals may turn out to be a recipe for disappointment rather than life satisfaction. By contrast, family goals and pro-social goals are generally (although not necessarily) non-zero sum. If family relationships improve, or pro-social goals are achieved, everyone can be better off; there do not have to be any losers.

This article extends the same line of inquiry by assessing the effects of additional priorities which seems likely to lead to non zero sum gains. It is hypothesized that individuals who choose (or are chosen) by partners with ‘benign’ personalities will have higher life satisfaction – net of their own personality traits – than individuals who choose partners with unfavourable personalities. Specifically, it is hypothesized that individuals whose partners are low on neuroticism and high on extroversion will be happier than those whose partners have the reverse characteristics. This result has been found in relation to marital satisfaction, so it seems plausible to extend the same idea to SWB (Robins, Caspi and Moffitt, 2000). Previous SWB research has shown that the life satisfaction and marital satisfaction of partners are quite highly correlated, although their satisfaction does not become more similar over time (Schimmack and Lucas, 2006). There has also been a great deal of research on whether people with similar personality traits tend to partner/marry each other (Robins, Caspi and Moffitt, 2000). They do, but the correlations between partners’ ratings on traits like neuroticism and extroversion are typically quite modest. Finally, it is known that people who have been happier as single people are subsequently likely to make happier marriages (Lucas, Clark, Georgellis and Diener, 2003; Lyubomirsky, 2008). However, there appears not to be any previous direct evidence on the issue of whether partner personality traits affect one’s own life satisfaction over and above one’s own traits. The evidence that partner traits matter will lead us to a reinterpretation of the view that getting married/partnered usually only produces a temporary gain in life satisfaction (Campbell, Converse and Rodgers, 1976; Clark, Diener and Lucas, 2008).

Now an economic choice: the standard framework of welfare economics rests on the assumption that the main choice or trade-off which individuals make in trying to maximize their welfare or utility lies between work and leisure. Paid work provides the funds for consumption, while leisure time (it is assumed) generates pleasure. The overall validity of the trade-off assumption has not been directly tested, using subjective measures of utility. In this article we use the German panel data to show that changes in the fit between a person's preferred and actual working hours - and hence, by implication, their hours of leisure - have significant effects in changing life satisfaction.

Another matter of individual choice is the extent to which one spends leisure time participating in social and community activities. There is abundant evidence that individuals with richer social networks or more social capital enjoy great life satisfaction (Bradburn, 1969; Putnam, 2000; Diener and Diener, 2008). The German panel data go beyond measuring static social networks and provide annual measures of frequency of participation in social and community events. It is hypothesized that active participation is positively related to life satisfaction. Note that social and community participation can be viewed as another field (or life domain) in which non zero sum gains are likely to be available.

The health domain is also non zero sum; plainly, gains to my health are unlikely to be associated with consequent losses to anybody else's health. Further, adopting a healthy lifestyle is, for most Western people, a matter of relatively free choice. The SOEP dataset includes two variables related to healthy lifestyle; frequency of exercise and BMI (weight relative to height). Much previous research has naturally been concerned with the impact of exercise, BMI and other lifestyle variables on health rather than life satisfaction. Reviews of the evidence relating to satisfaction have generally suggested positive relationships, but with an important 'reverse causation' caveat, namely that people who are happier in the first place may choose more exercise and a healthier diet (Diener and Diener, 2008). Here it is hypothesized that healthy lifestyle promotes life satisfaction, net of personality traits, life goals and other antecedent variables. This approach does not rule out the possibility of some reverse causation, but a more plausible interpretation (it is

suggested) is that personality traits are causally antecedent and affect both choice of lifestyle and satisfaction.

The aim then is to move towards developing a theory of stability and change – especially medium and long term change – in SWB. The best available dataset for this purpose is SOEP, which is the longest running panel survey in the world in which questions on SWB (life satisfaction) have been asked on an annual basis. As described in the next section, the 25-year file (1984-2008) has been split into five five-year periods in order to facilitate investigation of medium term change.

## **METHODS**

### ***The German Socio-Economic Panel (SOEP) 1984-2008***

SOEP began in 1984 in West Germany with a sample of 12541 respondents (Wagner et al., 2007). Interviews have been conducted annually ever since. Everyone in the household aged 16 and over is interviewed; here we make particular use of the data on the personality traits of spouses. The cross-sectional representativeness of the panel is maintained by interviewing ‘split-offs’ and their new families. So when a young person leaves home (‘splits off’) to marry and set up a new family, the entire new family becomes part of the panel. The sample was extended to East Germany in 1990 and since then has also been boosted by the addition of new immigrant samples, a special sample of the rich, and recruitment of new respondents partly to increase numbers in ‘policy groups’. There are now over 60,000 respondents on file, including some grandchildren as well as children of the original respondents. The main topics covered in the annual questionnaire are family, income and labor force dynamics. A question on life satisfaction has been included every year.

For this paper the sample is restricted to prime age West German adults, defined as those aged 25 to 64. The aim is to restrict analysis to mature age individuals who, according to set-point theory, should have stable levels of SWB. The lower age limit excludes individuals whose personalities may still be changing. The top limit excludes senior

citizens who might find it absurd to talk about life goals/priorities, especially career goals, in the later part of their life when most are retired.

## ***Measures***

### *Life satisfaction*

The dependent (outcome) variable in all equations is Life Satisfaction measured in SOEP on a 0-10 ('totally dissatisfied' to 'totally satisfied') scale. This single item measure is plainly not as reliable or valid as multi-item measures of SWB, but it is widely used in international surveys and has been reviewed as acceptably valid (Diener et al, 1999).

### *Personality traits*

In 2005 SOEP included a full set of personality measures for the first time. The chosen instrument was a short version of the Big Five Personality Domains – NEO-AC (Costa and McCrae, 1991). The traits in the Big Five are neuroticism, extroversion, openness, agreeableness and conscientiousness. SOEP used short versions of the five scales which are reported to be satisfactorily correlated with the much longer versions developed by psychologists (Gerlitz and Schupp, 2005).

Psychologists usually take the view that personality is about 50% hereditary and quite stable, at least from the age of about 25 or 30 onwards (Roberts, Walton and Viechtbauer, 2006). It should be stressed that, by including personality traits measured in 2005 on the right hand side of equations to account for life satisfaction in earlier as well as later years, we are in effect assuming that personality is completely stable. If it were completely stable, then of course it would not matter when it was measured. However, the assumption is not entirely correct. It is thought that ratings on personality traits might be changed to a moderate degree by life experiences like having a stable marriage or an absorbing job (Roberts, Walton and Viechtbauer, 2006; Scollon and Diener, 2006).

### *Life goals/values*

Prior to SOEP's venture into the field, several other researchers had attempted to measure life goals/values and had struck problems. In a very thorough investigation, two pioneers

of SWB research, Andrews and Withey (1976) reported that measures of the priority attached to goals, asked on scales running from ‘very important’ to ‘not at all important’, appeared to suffer from social desirability bias, with respondents all giving high ratings to family goals. Importance scores also had low test-retest reliability. A further possible problem was that importance scores and satisfaction scores in most life domains turned out to be moderately correlated. This might mean that people were quite good at getting what they wanted in life – a result in line with economists’ utility maximization assumption – or might suggest some reverse causation, with respondents tending to impute importance to domains they were already well satisfied with, perhaps as a psychological mechanism to boost their overall life satisfaction (Andrews and Withey, 1976). In general, respondents whose life satisfaction was high tended to rate most domains as very important, whereas unhappy or depressed respondents tended (presumably as a consequence of unhappiness) to rate most domains as relatively unimportant. An underlying problem, which may account for specific measurement difficulties, is probably that most people are not of a philosophical bent and do not regularly think about their life priorities.

The SOEP group at DIW Berlin, which runs the survey, has made considerable improvements in goals/values measurement and, in particular, items have been developed which have a stable factor structure and adequate test-retest reliability (Wagner et al., 2007). Goals have been measured intermittently (rather than annually) in SOEP, starting in 1990. The items are based (although with some changes of wording) on a classification of goals/values initially developed by Kluckhohn and Strodtbeck (1961). The instrument set out to measure three sets of goals/values:

- material goals/values and success
- family goals/values: marriage, children and the home
- pro-social or altruistic goals/values: friendship, helping others, social and political activism.

This approach represents an improvement on most previous measurement efforts which tended to list miscellaneous goals relating to many domains of life, rather than starting with an a priori classification.

The SOEP survey managers have varied the specific questions asked in different waves of the survey; here we will use data from the 1990, 1992, 1995, 2004 and 2008 surveys in which the questions were nearly identical. In these surveys 9 or 10 items were included<sup>3</sup>, all asked on a 1-4 scale running from ‘very important’ to ‘not at all important’. In each wave the items formed three distinct, replicating factors: a *material goals/values* factor, a *family goals/values* factor and an *pro-social or altruistic goals/values* factor (Headey, 2008b). Material goals may be viewed as zero sum, whereas family goals and pro-social goals are non-zero sum.

Because the focus of the paper is on the impact of different categories of life goals/values on life satisfaction, it was decided that, for subsequent analysis, it would be preferable to retain only those items which both substantively and statistically clearly related either to zero sum or to non-zero sum goals. So we constructed a *material goals* index which gave equal weight to ‘being able to buy things’, and ‘success in job’. An item relating to ‘fulfilling your potential’ was dropped, primarily on grounds of face validity; a desire for self-development does obviously relate to a desire for material success. Similarly a *family goals* index was constructed which gave equal weight to marriage and children items. An item relating to owning a car was dropped because it is not plainly related to family goals. Finally, the *pro-social/altruistic goals* index gave equal weight to ‘being involved in social and political activities’ and ‘helping other people’<sup>4</sup>.

We have not attempted to assess the effects of changes in life goals/values in this paper. Because the questions have been slightly reworded in different waves and only asked at irregular intervals, the data are not really suited to analysis of change. Instead we have

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<sup>3</sup> Ten items were included in 1990, 1992 and 1995 and then nine in 2004 and 2008. The item dropped in 2004 and 2008 related to the importance of having a wide circle of friends, which loaded on the altruism factor.

<sup>4</sup> The item ‘having a circle of friends’ was included in 1990 and 1995 and also loaded on this factor.

averaged respondents' scores on goals for the waves in which they participated. So, in practice, we are assessing the effects on SWB of average long term commitment to these three sets of goals or values.

#### *Preferred and actual working hours*

The trade-off between paid work (or rather the consumption that work pays for) and leisure is central to welfare economics. Respondents in the SOEP panel are asked both how many hours per week they actually work (in all jobs combined, if they have more than one job), and how many they would prefer to work. The gap between these two figures can be treated as a rough measure of the degree to which they are achieving their preferred trade-off/choice between work and leisure, subject to the constraints of their current labor market opportunities. Here we classify individuals whose actual working time is within three hours of their preferred time as having their preferences met. We treat those who work over three hours more than they want as 'overworked', and those who work over three hours less than they want as 'underworked'. Other hours 'gaps' were tested, but the 3-hour variables showed the highest correlation with life satisfaction.

#### *Social participation*

Questions have been asked every year in SOEP about participation in social activities and community involvement. The social participation index used here combines two quite highly correlated items about frequency of "meeting with friends, relatives or neighbours" and "helping out friends, relatives or neighbours".<sup>5</sup> The questionnaire scale measuring the frequency of these activities has not been completely consistent over the years. Here we use a 3-point scale: 'every week', 'every month' and 'seldom or never'.<sup>6</sup>

#### *Healthy lifestyle*

SOEP is now increasing its measures of health and healthy lifestyle. However, the only lifestyle measure available from inception relates to frequency of participation in active

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<sup>5</sup> The correlations have varied from year to year but are usually around 0.3.

<sup>6</sup> 'Seldom' or 'never' have been included as separate categories in more recent waves of SOEP.

sport or exercise. This is asked on a 4-point scale running from ‘almost never or never’ to ‘at least once a week’.

A second healthy lifestyle measures, Body-Mass Index (BMI), is only available for alternate years, starting in 2002. BMI measure the appropriateness of weight for height. A BMI between 18.5 and 24.9 is considered ‘normal’, under 18.5 is ‘underweight’, 25.0 to 29.9 is ‘overweight’ and 30+ is ‘obese’.

*Data analysis based on a five by five-year longitudinal file (1984-2008)*

Almost all longitudinal analyses of individual or household panel data are based on annual waves, reflecting the time interval at which data are actually collected. But it is already known that annual changes in life satisfaction are mainly just temporary fluctuations due to life events. In this paper our aim is to account for medium term stability and change, so it seemed appropriate to calculate five-year averages of life satisfaction scores for the 25 years of data (1984-88, 1989-93 etc) and to assign these averages to each year within its five-year period. This set-up allows us to relate respondents’ annual scores for each explanatory variable to measures of medium term change in life satisfaction.

It should also be noted that values for some explanatory variables which were not included in every wave of the SOEP survey have been imputed. In particular, the NEO-AC has been asked only once (in 2005), so we needed to assume that personality is stable and impute it for all other years. Not to have done so would have voided all longitudinal analyses. Other variables were imputed by averaging adjacent years to provide values for missing years. For example, questions about life goals were asked in 1990 and 1992, but not 1991. So values for 1991 were imputed with averages of 1990 and 1992 results. Panel conditioning effects are a possible source of bias. That is, panel members might tend to change their answers over time – and answer differently from the way non-panel members would answer - as a consequence just of being panel members. There is some evidence in SOEP that panel members, in their first few years of responding, tend to report higher life satisfaction scores than when they have been in the panel for a good



many years (Frijters, Haisken-DeNew and Shields, 2004). This could be due to ‘social desirability bias’; a desire to look good and appear to be a happy person, which is stronger in the first few years of responding than in later years. Or it could be due to a ‘learning effect’; learning to use the middle points of the 0-10 scale, rather than the extremes and particularly the top end.

To compensate for these possible sources of bias, we include in all equations a variable which measures the number of years in which each panel member has already responded to survey questions.

## **RESULTS**

The sequence of analyses and models presented in this section reflects an assumed temporal and causal sequence. It is assumed that an individual’s own personality traits are substantially hereditary and that they, along with other fixed characteristics like gender and ethnicity, should be controlled in subsequent models which include choices relating to partner characteristics, life goals/priorities and so forth. Later it is assumed that both personality traits and life goals/values should be regarded as causally antecedent to choices about working hours, social participation and ‘healthy lifestyle’.

### *Effects of Own and Partner’s Personality Traits on Life Satisfaction*

The first column of results in Table 1 shows the effects of personality traits (NEO-AC) on life satisfaction, controlling for standard demographic variables. These personality variables are viewed in set-point theory as being crucial for stabilizing satisfaction. The controls included in this and all subsequent models are: gender, age, age squared and age cubed (to allow for a decline in satisfaction in middle age), marital/partnership status, being unemployed, having a health disability, being foreign born and ‘number of years already a SOEP respondent’. It was decided not to include level of formal education, occupational status or household income as controls because they could well be partly consequences rather than antecedents of personality traits and life goals. It should be

noted, however, that if these extra controls are (mistakenly?) included, then all results given below remain substantially unchanged.

Table 1 reports results for the whole sample and then separately for partnered men and partnered women. Clearly, the results of main interest (columns 2 and 3) relate to partnered people and show evidence of the effect of partner personality traits on one's own life satisfaction. These are Generalized Least Squares (GLS) random effects regressions, which make use of all 25 waves of data, but yield static rather than longitudinal results because personality is assumed to be stable.

Table 1  
Effects of Own Personality and Partner's Personality on Life Satisfaction: GLS Random Effects Panel Regressions (metric coefficients, p-values based on robust standard errors)

	All: Personality + Controls <sup>a</sup>	Partnered Men: As before + Partner Personality <sup>a</sup>	Partnered Women: As before + Partner Personality <sup>a</sup>
Neuroticism	-0.27 ***	-0.25 ***	-0.21 ***
Extroversion	0.07 ***	0.06 ***	0.07***
Openness	0.07 ***	0.05**	0.05
Agreeableness	0.07 ***	0.07***	0.07**
Conscientiousness	0.06 ***	0.06**	0.04
<b>Partner Neuroticism</b>		-0.06 ***	-0.06**
<b>Partner Extroversion</b>		-0.00	-0.02
<b>Partner Openness</b>		0.04 *	0.03
<b>Partner Agreeableness</b>		-0.00	-0.01
<b>Partner Conscientiousness</b>		0.02	0.01
Adj. R squared	20.9%	21.6%	19.2%
N	157771	59230	62712

a. All results (coefficients) are net of gender, age, age squared, age cubed, partner status (1-0), unemployed (1-0), health disability (1-0), foreign born (1-0), East German (1-0), the national unemployment rate and a count variable measuring the number of years respondents had already participated in the survey.

\*\*\* significant at 0.001 \*\*significant at 0.01 \*significant at 0.05

It has long been known that the personality traits of neuroticism (N) and extroversion (E), especially N, are quite strongly related to SWB (Costa and McCrae, 1980). The SOEP data further suggest that traits openness (O), agreeableness (A) and conscientiousness (C)

are favourable for SWB. The results relating to A and C have been found in several population surveys (Lucas, 2008), but O is generally found to be unrelated to SWB (Headey and Wearing, 1989), so the SOEP result may well not replicate.

The somewhat new and quite important results here apply only to partnered people. It is clear that partner's level of neuroticism has a negative and significant effect ( $p < 0.001$ ) on an individual's own SWB, over and above his/her own traits. Partner's openness has a significant positive effect on SWB for partnered men ( $p < 0.05$ ).<sup>7</sup> Partner E, A and C appear not to matter.

A hypothesis sometimes put forward is that partners who have similar personalities are likely to be suited to each other and may have higher SWB as a consequence (Robins, Caspi and Moffitt, 2000).<sup>8</sup> This hypothesis was tested by constructing a partner similarity/difference score for each of the five traits. It transpired that, when these variables were added to the equations, none of them accounted for significant additional variance. In other words, the evidence indicates that the extent to which partner personality is favourable to SWB matters, but personality similarity between partners offers no additional benefits. Robins, Caspi and Moffitt (2000) report a similar result in relation to marital satisfaction.

It is important to stress that, because adult personality is stable, these results imply that partnering/marrying a person with 'favourable' traits will bring about a *long term improvement* in one's SWB, whilst partnering a person with 'unfavourable' traits will bring about a *long term loss*. These implications are contrary to some previous research which has found that 'getting married' usually produces only a one or two year gain in SWB, after which people revert to their previous set point (Clark, Diener and Lucas, 2008). To assess these implications further, separate equations were run for partners who

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<sup>7</sup> This result relating to partner O may not replicate. As noted above, the positive association between O and life satisfaction found in SOEP is unusual. O is generally found to be uncorrelated with life satisfaction.

<sup>8</sup> An alternative hypothesis is that 'unlike poles attract' and that partners with contrasting personalities will get on better together and have higher SWB. This hypothesis was also tested and rejected via the partner similarity/difference scores constructed here.

had lived together for less than 5 years, 5-10 years, 10-20 years, and over 20 years. It was hypothesized that gains and losses to SWB might diminish the longer one remained with the same partner. This proved *not* to be the case. In all sub-groups partner personality, especially trait N, made a substantial difference to SWB. The issue of reconciling previous evidence about the short term effects of ‘getting married’ with the evidence here is fairly straightforward and will be taken up in the Discussion section.

*Effects of Own Life Goals/Values and Partner’s Life Goals/Values on Life Satisfaction*

Table 2 gives results relating to the impact on life satisfaction of both one’s own life goals and partner life goals. Personality traits (and standard demographics) are treated as antecedent to life goals and so are included in the equations as controls. In Table 2 results are also based on Generalized Least Squares (GLS) random effects regression equations. Random effects equations can be appropriate when one wants to capture both cross-sectional between-person differences and longitudinal within-person differences. The personality differences here are of course entirely between-person (since adult personality is assumed to be stable), but differences in life goals are within-person – they can and do change over time – as well as between-person.

Table 2  
Effects of Own Life Goals and Partner's Life Goals on Life Satisfaction: GLS Random Effects Panel Regression Analyses (metric coefficients, p-values based on robust standard errors)

	All: Personality + Life Goals + Controls <sup>a</sup>	Partnered Men: As before + Partner Life Goals <sup>a</sup>	Partnered Women: As before + Partner Life Goals <sup>a</sup>
Neuroticism	-0.28 ***	-0.25 ***	-0.21 ***
Extroversion	0.06 ***	0.06 ***	0.07 **
Openness	0.06 ***	0.03	0.03
Agreeableness	0.04 ***	0.05**	0.05
Conscientiousness	0.06 ***	0.06**	0.05
Partner Neuroticism		-0.07 ***	-0.05 *
Partner Extroversion		-0.02	-0.02
Partner Openness		0.04*	0.03
Partner Agreeableness		-0.02	-0.02
Partner Conscientiousness		0.02	0.02
<b>Social/Altruistic Goals</b>	0.27 ***	0.19 ***	0.21 ***
<b>Family Goals</b>	0.21 ***	0.15 ***	0.14 **
<b>Material Goals</b>	-0.10 ***	0.03	-0.06
<b>Partner Social/Altruistic Goals</b>		<b>0.14**</b>	<b>0.09</b>
<b>Partner Family Goals</b>		<b>0.15***</b>	<b>0.17 **</b>
<b>Partner Material Goals</b>		<b>-0.17***</b>	<b>-0.09</b>
R squared <sup>b</sup>	22.4%	23.7%	21.0%
N	154710	57858	61427

a. All results (coefficients) are net of gender, age, age squared, age cubed, partner status (1-0), unemployed (1-0), health disability (1-0), foreign born (1-0), East German (1-0), the national unemployment rate and a count variable measuring the number of years respondents had already participated in the survey.

b. The R<sup>2</sup> reported here is a weighted average of variance accounted for 'between persons' and 'within persons'.

\*\*\* significant at 0.001 \*\*significant at 0.01 \*significant at 0.05

The evidence here indicates that people who prioritise non zero sum pro-social, altruistic goals or family goals are more satisfied with life than people who prioritise zero sum goals relating to material success and careers. It appears that pro-social goals can make a substantial contribution to SWB, whereas material goals are not helpful to life satisfaction and may actually be harmful (Nickerson et al, 2003; Diener and Seligman,

2004; Headey, 2008b). It should be stressed that what is being measured here is the *relative importance* of different life goals. A quite large majority of respondents actually gave top priority to family goals. But the results show that those who gave relatively high priority to pro-social altruistic goals (relative to other individuals and relative to themselves at other time points) tended to be more satisfied with life, while those who gave relatively high priority to material goals were less satisfied.

Remarkably, the evidence in Table 2 further suggests that, for men, their partner's commitment to pro-social and family goals further increases their own life satisfaction. If their partner gives priority to material goals, their life satisfaction is lower. It appears that women's life satisfaction is enhanced if their partner is committed to family goals/values. It will be important to see if these results replicate in other samples and other countries.

### **Actual and preferred working hours, social participation and healthy lifestyle**

Next, we consider three choices which, in terms of causal ordering, may be regarded as consequences of both personality traits and life goals. Arguably, an important issue in welfare economics is the degree to which achieving one's preferred trade-off between work and leisure actually contributes to subjective utility. Recall that we classify individuals whose actual working time per week is within three hours of their preferred time as having their preferences met. We treat those who work over three hours more than they want as 'overworked', and those who work over three hours less than they want as 'underworked'. Two other groups are also included: unemployed people who are actively seeking work and people not currently in the labor force.

A second choice whose consequences are shown in Table 3 is the choice to be more or less active in social groups with friends, neighbours and relatives. A further choice is to be active in sport and/or in taking regular exercise.

Table 3  
Effects of Working Hours, Social Participation and Healthy Lifestyle on Life Satisfaction: GLS Random Effects Panel Regressions (metric coefficients, p-values based on robust standard errors)

	All Respondents: Own Personality + Life Goals + Work Hours + Social Participation + Healthy Lifestyle <sup>a</sup>	Men: Own Personality + Life Goals + Work Hours + Social Participation + Healthy Lifestyle <sup>a</sup>	Women: Own Personality + Life Goals + Work Hours + Social Participation + Healthy Lifestyle <sup>a</sup>
Neuroticism	-0.27***	-0.27 ***	-0.26 ***
Extroversion	0.05 ***	0.05 ***	0.06 ***
Openness	0.05 ***	0.05 ***	0.05 ***
Agreeableness	0.04 **	0.05 ***	0.04*
Conscientiousness	0.06 ***	0.06 ***	0.04 *
Social/Altruistic Goals	0.24 ***	0.23 ***	0.25 ***
Family Goals	0.21 ***	0.19 ***	0.23 ***
Material Goals	-0.10 ***	-0.05	-0.14 ***
<b>Employed but underworked<sup>b</sup></b>	-0.05 ***	-0.04 ***	-0.07 ***
<b>Employed and overworked<sup>b</sup></b>	-0.02 **	-0.02 **	0.01
<b>Unemployed<sup>b</sup></b>	-0.31 ***	-0.36 ***	-0.27 ***
<b>Not in labor force<sup>b</sup></b>	-0.02	-0.14 ***	0.02
<b>Social Participation</b>	0.09 ***	0.09 ***	0.09 ***
<b>Exercise: Frequency</b>	0.03 ***	0.02 ***	0.03 ***
R-squared <sup>d</sup>	22.1%	23.2%	21.0%
N	123044	64177	58867

a. All results (coefficients) are net of gender, age, age squared, age cubed, partner status (1-0), unemployed (1-0), health disability (1-0), foreign born (1-0), East German (1-0), the national unemployment rate and a count variable measuring the number of years respondents had already participated in the survey.

b. The R<sup>2</sup> reported here is a weighted average of variance accounted for 'between persons' and 'within persons'.

\*\*\* significant at 0.001 \*\*significant at 0.01 \*significant at 0.05

The evidence in Table 3 indicates that people who find themselves working much less than they want are significantly less satisfied with life than those who come close to making their preferred trade-off between work and leisure. For both men and women being 'underworked' is much worse than being 'overworked', presumably because lost consumption rankles worse than lost leisure. Being involuntarily unemployed is worst of all.

It also seems clear that both the choice to engage in a range of social and community activities in one's leisure time, and the choice to exercise relatively frequently, can have substantial effects on life satisfaction. The first of these results can be regarded as confirming previous research by Bradburn (1969) and more generally Putnam (2000), while the second confirms repeated findings in the public health literature. The somewhat new contribution here is to show that both results hold net of personality traits.

A second measure of 'healthy lifestyle', BMI, can be added to the equations in Table 3 for 2002 onwards.<sup>9</sup> Results are markedly different for men and women. Underweight men (BMI <18.5) have significantly lower life satisfaction than average (b= -0.18, p<0.01), whereas it is obese women who are unhappy (b= -0.21, p<0.01). Underweight women are little more satisfied than average (b=0.06, p=0.01).<sup>10</sup>

A final piece of analysis is more precisely focused on the issue of whether *changes* in life choices produce *changes* in life satisfaction. Table 4 gives results of fixed effects equations, rather than the random effects equations shown in previous tables. In the fixed effect model only within-person changes over time are analysed. An advantage of this model, which can only be used when a reasonably long series of repeated measures is available, is that all variables which, from a within-person point of view, are time invariant are 'controlled'.<sup>11</sup> So in Table 4 we can think of *all* genetic factors which affect SWB as being controlled, not just personality traits.

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<sup>9</sup> Consequently an annual measure of life satisfaction, rather than a 5-year average measure, serves as the dependent variable.

<sup>10</sup> Obese men were not significantly less satisfied than average (b= -0.05, p> 0.10).

<sup>11</sup> In previous tables, dealing with personality traits and life goals, assumptions required for a fixed effects model were not met. Personality traits have only been measured once in SOEP, and life goals on only a few occasions and at uneven intervals.



Table 4

*Changes in Working Hours, Social Participation and Healthy Lifestyle affect Changes in Life Satisfaction: Fixed Effects Panel Regressions (metric coefficients, p-values based on robust standard errors)*

	All Respondents <sup>a</sup>	Men <sup>a</sup>	Women <sup>a</sup>
Employed but underworked <sup>b</sup>	-0.08***	-0.07***	-0.07***
Employed and overworked <sup>b</sup>	-0.02*	-0.02**	-0.01
Unemployed <sup>b</sup>	-0.32***	-0.44***	-0.23***
Not in labor force <sup>b</sup>	-0.10***	-0.24***	-0.03
Social Participation	0.06***	0.07***	0.06***
Exercise: Frequency	0.02***	0.03***	0.02***
R-squared	5.3%	7.6%	4.3%
N	142390	69842	72548

a. All results (coefficients) are net of age, age squared, age cubed, partner status (1-0), unemployed (1-0), health disability (1-0), foreign born (1-0), East German (1-0) and the national unemployment rate. The  $R^2$  reported here is a weighted average of variance accounted for 'between persons' and 'within persons'.

\*\*\* significant at 0.001 \*\*significant at 0.01 \*significant at 0.05

This final set of results indicates that changes over time in levels of social participation and exercise, and in the fit between actual and preferred working hours, co-vary with changes in life satisfaction. In other words, choices about these three matters significantly influence SWB, net of the effects of all genetic and other time invariant factors.

## DISCUSSION

*Integrating results: choice of partner, life goals, working hours, leisure activities and healthy lifestyle*

The results in this paper show that five sets of choices make a substantial difference to life satisfaction. Key choices relate to one's partner, life goals/values, the trade-off between work and leisure, social participation and healthy lifestyle. Life goals and some choices have as much or more impact on life satisfaction than variables routinely described as important in previous research, including extroversion and being married/partnered. If we use these last two variables as benchmarks, it appears that partner's level of neuroticism, and one's own commitment to family and altruistic goals, participation in social events and regular exercise, are all equally or more important than

being extroverted.<sup>12</sup> For women, being obese appears to more dissatisfying than not having a partner. Being underworked or overworked is, however, less serious!

These results have major implications for SWB theory. In order to understand the implications more clearly, it helps to understand how the choices are linked. First, as several researchers have noted, the life satisfaction levels of partners/married people are strongly positively correlated; the Pearson correlation as measured in SOEP is actually 0.54 for prime age German partners. It is not completely obvious that the reason for this positive relationship is that happy people make each other happier, while miserable people make each other more miserable. An alternative explanation lies in the well established finding that people with similar personality traits tend to partner/marry each other. So it is on average true that people with personalities favourable to SWB (low N, high E etc) tend to partner, as do people with personalities harmful to happiness. In SOEP the correlations between partner personality traits range from 0.05 for E, through 0.17 for N, up to 0.26 for C. Such results in themselves could partly explain the positive correlations between the SWB levels of partners. However, in this paper it has been shown (Table 1) that something more is involved and that partners do promote or damage each other's longer term SWB. That is, the personality of one's partner contributes to SWB over and above the effects of one's own personality. As reported earlier, this result is unaffected by the degree of similarity or difference between the traits of partners.

These findings about partners suggest that SWB researchers should probably go back to Lucas et al's (2003) original view that, after getting married, some individuals record long term gains in SWB, while others show long term losses. The later view of the same authors, namely that marriage is just one of many life events that only produces a temporary (in this case upward) fluctuation in life satisfaction, seems incorrect (Clark, Diener and Lucas, 2008). The long term SWB of individuals who partner/marry a person with a similar personality to themselves is unlikely to change, but those who marry

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<sup>12</sup> These benchmark assessments are made on the basis of re-running analyses with standardized variables and coefficients (Betas). That is, variables were rescaled to have means of zero and standard deviations of one. Rough comparisons can then be made between the effect sizes of regression coefficients, because they have all had the same metric imposed.

someone with a more 'favourable' personality record gains, while those who partner someone with an unfavourable personality show losses. These outcomes are in line with Gottman's celebrated longitudinal and case study research on marital satisfaction documented in *The Marriage Clinic* (1997). They are also, but misleadingly, compatible with finding that the *average* effect of the life event of 'getting married' is zero.

The results in this paper relating to the impact of partner's life goals/values on SWB build on previous results suggesting that an individual's own life goals matter (Emmons, 1986; Headey, 2008b). It clearly runs counter to set-point theory to find that the extent to which both self and partner attach priority to pro-social, altruistic goals affects SWB. A proponent of set-point theory might perhaps speculate that the goals one espouses are partly genetically determined. But it stretches belief to imagine that a partner's life goals could be strongly influenced by an individual's own genetic make-up. However, a very indirect and so presumably weak link is possible. It might be that genes, and personality traits in particular, create a predisposition to find a partner with similar traits to oneself, and that 'his' and 'her' genes both then predispose towards similar life goals. In this context it should be noted that there are moderate correlations in the SOEP data between the life goals of partners. The Pearson correlation between the priority attached by self and partner to pro-social altruistic goals is 0.41, and the equivalent correlations for self and partner family goals and material goals are 0.52 and 0.37. Even so, although genes might be indirectly implicated, it is important to remember the point that geneticists routinely make...genes are not destiny, they just create predispositions.

Putting results together, it is important to see that there are quite strong and readily interpretable associations among all the variables linked to life satisfaction. Individuals who themselves rate low on N and high on E, O, A and C tend to partner/marry people with similar traits, and these partners also have similar life goals. Further, ratings on both traits and goals are associated with activities which promote SWB, namely greater social participation and a healthy lifestyle. In particular, traits E and O are moderately associated with pro-social, altruistic life goals and with greater participation in social and community activities. The link between pro-social goals and active social participation

suggests that self-reported goals are more than just abstract statements (or idealized self-images) and have plausible connections to actual behaviour. In making this point, it is not assumed that all causation runs in one direction. It is likely that repeated patterns of behaviour influence life goals, as well as vice-versa.

*SWB theory: moving towards a theory of long term stability and change*

On the basis of the German panel data, it seems almost indisputable that a substantial minority of people record long term, more or less permanent changes in their levels of SWB. So one key challenge for researchers is to try and build a theory which accounts for medium and long term change, as well as stability. Plainly set-point theory, as currently understood, only accounts for stability. The effects of life events are taken into account, but events are viewed as exogenous shocks and (with the exception of long term or repeated unemployment) are believed to produce only temporary fluctuations in SWB.

The focus of this article has been on individual choices which affect SWB. It has been found that choices relating to partnering, life goals, hours of work, social and community participation and health make a substantial difference. It appears that giving relatively high priority to life domains in which it is usual to pursue non zero sum goals is a better recipe for happiness than giving priority to domains in which goal pursuit involves gains for some at the expense of losses for others. Non zero sum domains (broadly speaking) include partnering and family life, social and community participation, and health. Zero sum goals (again broadly speaking) include those relating to career advancement, enhanced status and material gains.

Use of the term 'choices' is often regarded as problematic, although less so in economics than the other social sciences. Obviously choices may be more or less constrained. On the face of it, however, choices relating to partner personality traits, life goals/values, social participation and healthy lifestyle appear relatively unconstrained. An apparent but by no means watertight inference is that some (perhaps many) people could change their life choices with beneficial consequences for their happiness. This inference is not watertight because some of the evidence in this paper has related to between-person differences, not

within-person changes over time. There are many notorious examples, especially in health research, of benefits inferred from between-person research not translating into significant within-person gains (Ebrahim and Smith, 1997). So it will be important in future SWB research to obtain longitudinal evidence, perhaps of an experimental or quasi-experimental kind (since we may have to wait a long time for panel data), on the effects of changes in choices on subsequent SWB.

Emerging evidence that the long term life satisfaction of many individuals is not stable should open up an exciting period in SWB research. Arguably, set-point theory has been stultifying in its implication that long term change in SWB is improbable and certainly not responsive to individual choice. The theory is usually taken to mean that a person's happiness is little more than a print-out of the characteristics that he/she was born with and developed early in life. It followed that neither individual goals, strategies and skills - nor public policy interventions - could do much to enhance happiness. Finding that SWB can and does change means that research in all these areas can be pursued with renewed purpose. Far from reaching a degree of closure with set-point theory, it now appears that we have a long way to go in developing a theory of change in SWB.

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