OECD Economics Department Working Papers No. 1158

An Exploration of the Determinants of the Subjective Well-being of Americans During the Great Recession

Aida Caldera Sánchez,

Caroline Tassot

https://dx.doi.org/10.1787/5jxzc9p57lq3-en

OECD

Unclassified **ECO/WKP(2014)54**

Organisation de Coopération et de Développement Économiques
Organisation for Economic Co-operation and Development **26-Aug-2014**

English - Or. English

ECONOMICS DEPARTMENT

ECO/WKP(2014)54
Unclassified

AN EXPLORATION OF THE DETERMINANTS OF THE SUBJECTIVE WELL-BEING OF AMERICANS DURING THE GREAT RECESSION

ECONOMICS DEPARTMENT WORKING PAPERS No. 1158

By Aida Caldera Sánchez and Caroline Tassot

JT03361315

Complete document available on OLIS in its original format

English - Or. English

Abstract/Résumé

AN EXPLORATION OF THE DETERMINANTS OF THE SUBJECTIVE WELL-BEING OF AMERICANS DURING THE GREAT RECESSION

This paper uses data from the American Life Panel to understand the determinants of well-being in the United States during the Great Recession. It investigates how various dimensions of subjective well-being reflected in the OECD Better Life Framework impact subjective well-being. The results show that income is an important determinant of subjective well-being. The unemployed and the disabled are significantly less satisfied with their lives than the working population, while the retired and the homemakers are more satisfied. The paper expands the existing evidence by showing that homeowners, registered voters and those with access to health insurance have higher levels of subjective well-being. Time spent walking or exercising is positively correlated with happiness, while working more than 50 hours per week or spending time on health-related activities is negatively correlated with subjective well-being, and higher levels of anxiety.

This Working Paper relates to the 2014 OECD Economic Survey of United States (www.oecd.org/eco/surveys/economic-survey-united-states.htm)

JEL Classification codes: I24; I30; I38; J22; J28; J31

Keywords: education, quality of life, provision and effects of welfare programmes, time allocation and labour supply, job satisfaction, wage level and structure.

****

EXAMEN DES DÉTERMINANTS DU BIEN-ÊTRE SUBJECTIF DES AMÉRICAINS PENDANT LA RÉCESSION

Le présent document utilise les données de l'enquête *American Life Panel* afin de comprendre les déterminants du bien-être aux États-Unis pendant la récession, l'objectif étant de déterminer comment les diverses dimensions du bien-être subjectif définies dans le cadre de mesure de l'initiative « Vivre mieux » de l'OCDE influent sur le sentiment subjectif de bien-être. Les résultats montrent que le revenu constitue un facteur important de bien-être subjectif. Les chômeurs et les personnes handicapées sont nettement moins satisfaits de leur vie que les actifs occupés, alors que les retraités et les femmes au foyer affichent des niveaux de satisfaction plus élevés. Les données existantes sont élargies et montrent que les propriétaires, les électeurs inscrits et les personnes pouvant bénéficier d'une assurance-maladie présentent des niveaux plus élevés de bien-être subjectif. Le temps consacré à la marche ou à l'exercice physique est associé à une hausse du niveau de bonheur, tandis que le fait de travailler plus de 50 heures par semaine ou de consacrer du temps à sa santé est associé à une baisse du niveau de bien-être subjectif et à des niveaux plus élevés d'anxiété.

Ce Document de travail se rapporte à l'Étude économique de l'OCDE des États-Unis (www.oecd.org/fr/eco/etudes/etats-unis.htm)

Classification JEL: I24; I30; I38; J22; J28; J31

Mots clés : éducation, qualité de vie, provision et effets des programmes sociaux, allocation du temps et offre de travail, satisfaction au travail, niveau et structure des salaires.

TABLE OF CONTENTS

Tables

Figures

AN EXPLORATION OF THE DETERMINANTS OF THE SUBJECTIVE WELL-BEING OF AMERICANS DURING THE GREAT RECESSION

by Aida Caldera Sánchez and Caroline Tassot[1]

Introduction

This paper uses data from the American Life Panel to understand the determinants of well-being in the United States during the Great Recession. It investigates how different dimensions of well-being reflected in the OECD Better Life Framework impact on subjective well-being.

The paper contributes to the extensive literature on well-being (for a review, see Dolan, Peasgood and White, 2008; or Diener, 2009) by investigating the relationship between well-being and the following less explored domains of the OECD Better Life Initiative: housing, health, work-life balance, and civic engagement. It uses various measures of quality of life to investigate their impact on individual well-being. Beyond life satisfaction, the analysis covers various subjective well-being measures, for instance experienced well-being (such as fatigue, feeling happy, difficulty sleeping, issues with depression) and evaluative well-being (such as satisfaction with income, satisfaction with social contacts, or with health).

The period represented in the data used for the analysis is interesting in itself as it covers the Great Recession in the United States, which through large fluctuations for instance in income, employment or the stock market has impacted many Americans. The unemployment rate in the United States rose from 4.8% in April of 2008 to 10.6% in January 2010 (Deaton 2012). Bricker et al., (2011) estimated that 60% of households experienced a decline in their wealth (net worth, or total assets less total liabilities) between 2007 and 2009, with about a quarter of households losing more than half of their wealth. Evidence from the American Life Panel (Hurd and Rohwedder, 2010) confirms those findings, showing widespread effects throughout education, income and age groups. A number of papers have investigated the effects of the Great Recession on the subjective well-being of Americans. For instance, Deaton (2011, 2012) uses Gallup Daily Poll data. This paper adds a new piece of evidence by making use of less frequently used dataset, the American Life Panel. The American Life Panel data surveys were implemented with high frequency, allowing us to spot and understand trends as they develop and to investigate the immediate effects of the determinants of well-being on the respondents' well-being while minimizing retrospection bias.

The main results can be summarized as follows:

- **Income**: Individuals with household incomes above USD 75 000 are significantly more satisfied with their lives, happier, and less anxious than those with lower incomes. In particular, we observe a gradient indicating that individuals are worse off the lower their income is relative to the wealthiest group. These findings are in line with Stevenson and Wolfers (2013). Increases in income are statistically significantly positively correlated with life satisfaction, household income satisfaction, satisfaction with job or other daily activities, and higher frequency of being happy.

1. Aida Caldera Sánchez works in the OECD Economics Department. Caroline Tassot is an Assistant Policy Analyst at the RAND Corporation. This paper was originally prepared for the OECD Economic Survey of the United States published in June 2014 under the authority of the Economic and Development Review Committee. The authors are grateful to Romina Boarini, Robert Ford, Patrick Lenain, Alvaro Pereira, Conal Smith and Douglas Sutherland, for their comments on earlier drafts. Special thanks go to Valery Dugain for statistical assistance and Heloise Wickramanayake for assistance in preparing the document.

- **Unemployment**: The unemployed are significantly less satisfied with their lives, their daily activities and household income, and are less happy than the working population. The onset of unemployment, controlling for changes in income, is associated with significant decreases in life satisfaction, satisfaction with household income and daily activities, as well as happiness. Conversely, returning to work is associated with increases in those subjective well-being domains.

- **Housing**: Home owners are on average more satisfied with their household income and those acquiring a home report significantly higher levels of well-being.

- **Health**: Time spent on health-related activities, such as visiting a doctor, taking medications or doing treatments is associated with lower happiness, and higher levels of anxiety, while an improvement in self-reported health is associated with higher general well-being and lower frequency of feeling worn out. Furthermore, benefiting from health insurance coverage is associated with an increase in all subjective well-being domains, controlling for individual heterogeneity, self-reported health and employment status.

- **Disability**: Disabled individuals are more likely to report to feel worn out. These findings are in line with those of Oswald and Powdthavee (2006) and Lucas (2007).

- **Work-life balance**: Time spent on walking or exercising, or spent with family and friends to be significantly and positively correlated with overall life satisfaction as well as overall happiness experienced throughout the day. In addition, time spent walking or exercising is associated with lower levels of anxiety. An indicator for those working more than 50 hours per week shows higher levels of anxiety for this group of workers.

- **Civic engagement**: Using registration as a voter as an indicator of civic engagement, we find the latter to be positively correlated with happiness.

Measuring subjective well-being: A review of the literature

Subjective well-being measures can be categorized as representing evaluative, experienced, or eudemonic measures (Kahneman and Riis, 2005). The latter represent psychological needs contributing to various dimensions of well-being independently of the immediate affect benefit they may provide (Dolan and Metcalfe, 2012). Examples of such needs include one's purpose and meaning in life, autonomy or self-actualization (Kahneman and Riis, 2005). Eudemonic measures have typically been collected using scales of psychological well-being developed by Carol Ryff, covering dimensions such as self-acceptance, personal growth, purpose in life, positive relations with others, being able to find a context suiting one's personal needs and capacities, and autonomy (Ryff and Singer, 2008).

Most studies focusing on subjective well-being use evaluative measures as indicators of individual well-being. Such measures represent a global retrospective assessment of one's life (Kahneman and Riis, 2005; Kahneman and Krueger, 2006). Life evaluations, while partly based on individuals' affective state and the immediate context of the survey, reflect the more stable circumstances of an individual's life, as most of its correlates (such as marital status or age) show little variation, thus making life satisfaction less vulnerable to transient conditions (Helliwell and Barrington-Leigh, 2010; Krueger and Schkade, 2006). Furthermore, evaluative measures can be elicited using a single item, for instance asking "how satisfied are you with your life as a whole these days?".

Experienced measures represent measures of the momentary affective states during a particular reference period or activity (Kahneman and Riis, 2006). They originate from the notion of utility being an

integral of momentary pleasure defined by pain and pleasure, or pleasant and unpleasant moments (Helliwell and Barrington-Leigh, 2010). While experienced measures have the advantage of providing a measure of "objective happiness" (Kahneman and Riis, 2005), in that the momentary states provide an ordinal measure of utility at a given point, and can thus be less vulnerable to retrospection biases, their measurement is more complex than evaluative measures. Two hedonic aspects, positive (e.g. happiness or joy) and negative (e.g. fear or sadness) affect have to be captured, usually within the context of a time-use surveys (Helliwell and Barrington-Leigh, 2010).

Evaluative and experienced well-being measures thus reflect different aspects of subjective well-being. As such, leading psychologists recommend the inclusion of both types into surveys rather than choosing one over the other (Diener et al., 2010).

In this study, we will focus on both evaluative and experienced measures, with a particular focus on the United States in recent years and, in light of the OECD's Better Life Initiative dimensions. The OECD's interest in well-being stems from its mission to find "better policies for better lives". In the last decade, the OECD has hosted various fora of discussion focusing on subjective well-being, and recently launched a set of new well-being indicators, known as the Better Life Initiative.[2] The OECD well-being indicators cover statistics related to the following eleven dimensions: income and wealth, housing, jobs and earnings, work and life balance, health status, educations and skills, social connections, civic engagement and governance, personal security, environmental quality, and subjective well-being. As a part of the broader methodological work to develop the statistical agenda on well-being, the OECD published in 2013 the "Guidelines on Measuring Subjective Well-being" (OECD, 2013), detailing a set of measurement methodologies and standards, in an effort to ensure a more consistent and efficient collection of official statistics on subjective well-being that can be compared across countries.

In line with the subjective well-being model used in the Guidelines above, the evaluative well-being measures in the present study include life satisfaction, as well as domain satisfaction such as satisfaction with total household income, the economic situation, and job satisfaction. Experienced measures include the frequency at which respondents reported to have been feeling worn-out, a happy person, having difficulties sleeping, or having problems with depression. We will further look at other experienced measures such as the frequency of feeling nervous, calm and peaceful, having a lot of energy, downhearted and blue, and tired, though these items were asked on a quarterly basis. Overall, these measures represent a wide-range of positive and negative effects.

Data

The data used in this paper are based on two surveys collected in the United States through the American Life Panel. The American Life Panel (ALP) is an ongoing Internet panel survey with approximately 5 000 individuals.[3] Panel members were recruited from respondents to the University of Michigan Survey Research Center's Monthly Survey (MS). Those who do not have access to the Internet are provided with a Web TV, including an Internet access subscription with an e-mail account. Post-stratification weights are provided so that after weighting, the ALP approximates the distributions of age, sex, ethnicity, education, and income in the Current Population Survey (CPS), the primary source of labor force statistics in the United States conducted jointly by the United States Census Bureau and the United States Bureau of Labor Statistics. About once a month, respondents receive an email request to visit the ALP website to complete questionnaires that typically take no more than 30 minutes to finish. Respondents are paid an incentive of about USD 2 per three minutes of survey time. Response rates are typically between 80 and 95% of the enrolled panel members, depending on the topic, the time of year, and

2. http://www.oecdbetterlifeindex.org.
3. For more information, see: https://mmicdata.rand.org/alp/index.php?page=main.

how long a survey is kept in the field. The ALP has conducted a large number of longitudinal surveys of its respondents, so that over time it has collected data on a very wide range of covariates. For example, studies using the ALP have focused on financial literacy (Brown, Kapteyn and Mitchell, 2011; Lusardi and Mitchell, 2007), work disability (Banks et al., 2008), or polling and voting (Delavande and Manski, 2010; Gutsche et al., 2013). One of the great advantages of the ALP is the possibility of merging information from different (past and future) surveys collected in the panel. We use this feature of the panel by merging information from monthly surveys collected between 2009 and 2013 as well as information on time-use collected in 2012. The data has disadvantages as well. As most internet based surveys it can be biased towards people who are more likely to fill in internet surveys, like those spare time to dedicate to such activities. The econometric analysis applies post-stratification weights, nonetheless such weighting might not correct for self-selection biases. Nonetheless, the fact that most results, as described below, are in line with previous research – that in some cases builds on higher quality dataset- suggests that these biases are not too big.

The first survey used in this paper is the result of a number of high-frequency surveys dedicated to tracking the effects of the recent financial crisis (Hurd and Rohwedder, 2010) and recession over 2009 to 2013. These surveys were initially fielded at the beginning of November 2008, immediately following the large declines in the stock market and the collapse of Lehman Brothers. A subsequent wave was collected three months later in February 2009. Since May 2009 and until April 2013 the data has been collected on a monthly basis, thus limiting the possibility of errors made by respondents in their reports. The survey covered a broad range of topics, including various dimensions of subjective well-being, self-reported health measures, work status, and housing, among many others.

The second survey used in this paper was based on two-waves, with questions related to some aspects of subjective well-being (overall satisfaction with life, happy yesterday, anxious yesterday) and on how respondents recollect spending their time (see Kapteyn et al., 2013), which were collected in 2012. The survey asks respondents the total hours spent on different types of activities, but limited to a one day reference period. This approach of collecting time-use data is different and notably less sound that time-use surveys that typically involve the collection of data in the form of a diary, asking respondents to report sequentially what they did in the previous 24 hours, as it is the case in the American Time Use Survey (Hammermesh, Frazis and Stewart, 2005). However, time-use surveys typically do not include information on well-being that allows the type of analysis in this paper.

The sample for the analysis thus consists of 3 221 individuals for the financial crisis surveys (for a total of 61 812 observations across time), and 1 478 individuals for the time-use data (for a total of 2 393 across the two waves of data), with a total of 1 174 individuals represented in both surveys.

Tables 1, 2 and 3 display the descriptive statistics for the sample based on the two surveys (financial crisis and time-use) on demographics and socio-economic status (Table 1) well-being covariates as categorised in the Better Life Initiative (Table 2) and subjective well-being measures (Table 3), respectively. Table 1 describes the sample socio-economic and demographic characteristics. Men represent 42% of the sample, with a great majority (66%) of respondents being married and white (86%). About a third of the sample earns more than USD 75 000, while 22% earn between USD 50 000 and USD 74 999. A fifth of the sample is retired, and more than half (56%) is working for pay. Table 2 displays the covariates used to investigate the dimensions of the Better Life Initiative, including the ownership of a home (74% of the sample), outstanding loans on a house (about half of the sample), log average income, being registered to vote, self-reported health, as well as health insurance coverage. The lower part of the table displays the average number of hours reported in one day for seven activities, as well as an indicator for those working more than 50 hours per week (11% of the sample worked more than 50 hours per week). Finally, Table 3 reports the statistics for the subjective well-being measures we study. The various measures of subjective well-being will be used as dependent variables in our analysis, allowing us to

investigate both evaluative and experienced well-being measures, proxied by not only life satisfaction, but also satisfaction with household income, satisfaction with job or daily activities, the frequency of being happy or feeling worn-out in the last 30 days, as well as level of happiness or anxiety in the previous day.

Furthermore Figures 1 and 2 provide an overview of the average level of satisfaction with life, household income, job or daily activities and the economic situation for different groups of individuals. Figure 1 shows the average level for individuals in households earning more than USD 50 000 and those earning less than USD 50 000. Wealthier households appear to report higher levels of satisfaction in all domains, in particular in terms of satisfaction with household income or the economic situation. Figure 2 displays the average level of satisfaction for the same domains, now divided between those working for pay and the unemployed. We observe lower levels on average for all satisfaction domains for the unemployed in comparison to those working for pay.

Empirical strategy

We follow the well-being literature (see for example Fleche, Smith and Sorsa, 2012; Stevenson and Wolfers, 2013; or Deaton and Kahneman, 2010) and consider a well-being function of the following form:

$$SWB_{it} = \alpha_i + \beta_1 X_{it} + \beta_2 T_t + \epsilon_{it} \quad (1)$$

Where SWB represents the subjective well-being measure of individual i at time t, X represents individual circumstances (for instance, unemployment or change in income) likely to impact individual i well-being. Note that the left hand side variable -subjective well-being- will be proxied by the various measures of subjective well-being described in Table 3. This approach is the most common approach in the well-being literature when focusing on identifying the determinants of subjective well-being (Dolan, Peasgood and White, 2008). The coefficient α_i represents the intercept for each individual, while β_1 represents the change in subjective well-being for a one-unit change in the individual circumstance. The inclusion of monthly time dummies β_2 (representing each wave of the survey) will control for any time-specific shocks that may affect subjective well-being. Such time-specific shocks that would affect the sample could for example include news of bank collapses, or the launch of government programmes.

Equation (1) can be estimated by ordinary least squares or an ordinal probit (or logit), given that the dependent variable is an ordinal variable. According to the literature (Ferrer-i-Carbonell, 2004; Stevenson and Wolfers, 2008), the choice of ordinary least squares or ordinal probit (or logit) does not lead to significantly different results when explaining life satisfaction. In the interest of providing the most intuitive coefficients, the analysis will be done using ordinary least squares, using individual fixed effects, α_i. The findings using the OLS methodology are generally confirmed when using an ordinal logit instead, as shown in the robustness checks in the Annex.

Determinants of subjective well-being

In this section, we review the literature and present the results of our analysis for the following Better Life Initiative dimensions: income and wealth, jobs and earnings, housing, health status, work-life balance, education and skills, as well as civic engagement. As a first step we estimate Equation (1) pooling the data. The results are reported in Table 4 for the regressions including the time use variables, for which only data for 2009 is available. Table 5 reports the results for the regressions including a larger set of covariates for which a larger set of data is available. Pooling the data allows us to look at correlations of individual characteristics with their average level of subjective well-being while holding other factors constant. As a second step we estimate Equation (1) controlling for individual fixed effects. Including individual fixed effects allows us to account for individual heterogeneity, and thus get closer to causal links between

subjective well-being and its determinants. The discussion of the results is organised along the different dimensions of the Better Life Initiative rather than along different measures of subjective well-being.

Income and wealth

In light of the debate regarding the use of economic indicators such as Gross Domestic Product or subjective well-being indicators, the perhaps most illustrative case is the question of whether a raise in individual income leads to an increase in subjective well-being. At the aggregate level, Easterlin (1974, 1995, 2005) finds there is no relationship between economic growth and happiness, while he finds that within a country wealthier individuals are happier than poorer individuals, stressing the contribution of relative income to individuals' well-being. Sacks et al., (2012) however find a positive gradient between GDP and life satisfaction across countries and over time (see also: Stevenson and Wolfers, 2008, Hagerty and Venhoven 2003 or Deaton 2008), as well as between income and life satisfaction within countries. The United States appear to be, however, an outlier in this relationship (Stevenson and Wolfers, 2008), a likely result of rising income inequality (Sacks et al., 2012).

This lack of consensus in the literature on the relationship between income and well-being could be due to confounding variables such as health or employment, as well as the scarcity of panel data tracking individuals' changes in income and subjective well-being over time (Layard, 2012). The theory of a satiation point in income, whereby beyond covering basic needs one's well-being does not increase with income has been shown at the individual level by Kahneman and Deaton (2010) in terms of positive affect in the United States. However, Stevenson and Wolfers (2013) find no evidence of such phenomenon when using happiness or life satisfaction with Gallup data on 155 countries. Our findings are in line with the findings of Easterlin (1974), Sacks et al., (2012) and Stevenson and Wolfers (2013).

We find that individuals with household incomes above USD 75 000 are significantly more satisfied with their lives, happier, and less anxious than those with lower incomes (Table 4). In particular, we observe a gradient indicating that individuals are worse off the lower their income is in comparison with the wealthiest group (column 1, Table 4). This result thus confirms the observations from Figure 1, where richer respondents appear to be more satisfied with their life, household income, economic situation and job or daily activities than poorer ones.

Furthermore, our results show that increases in income are statistically significantly positively correlated with life satisfaction, household income satisfaction, satisfaction with job or other daily activities, and higher frequency of being happy (Table 6), after controlling for individual unobserved characteristics. These findings are in line with the studies providing causal estimations (using exogenous variations in individual income), to evaluate the effect of an increase in income on subjective well-being. For instance, Gardener and Oswald (2006) show a decrease in psychological strain for individuals winning GBP 1 000 or more in the lottery in the UK. Similarly, Frijters et al., (2006) find that more than a third of the increase in life satisfaction in East Germany following the reunification can be attributed to the large increase in real household income East Germans experienced.

Jobs and earnings

There is a consensus in the literature in recognizing that an individual's employment status has an important effect of individual subjective well-being. In particular, the evidence suggests that unemployment is consistently associated with lower levels of individual well-being (Clark and Oswald, 1994; Winkelman and Winkelman, 1998; Clark, Knabe and Rätzel, 2010). The detrimental effects of unemployment on well-being have been shown to go beyond the loss of income: individuals may face higher mental distress in the form of depression or anxiety, or lose confidence (Winkelman and Winkelman, 1998; Frey and Stutzer, 2002). One discussion in the literature is regarding the direction of

causality and whether, for instance, depressed individuals' self-select into unemployment rather than unemployment causing worse well-being outcomes. However, these concerns have been dismissed by Lucas et al., (2004) as well as by Winkelman and Winkelman (1998). Furthermore, Lucas et al., (2004) provide evidence showing that unemployment has long term consequences on well-being, in particular, unemployment alters individuals' set-point levels of life satisfaction, so that individuals do not return to their pre-unemployment levels of subjective well-being even after an unemployment spell has ended.

We find the unemployed to be significantly less satisfied with their lives, their daily activities and household income, and to be less happy than the working population (Table 4). The onset of unemployment, controlling for changes in income, is associated with significant decreases in life satisfaction, satisfaction with household income and daily activities, as well as happiness (Table 6). Here again, those findings confirm what can be observed in Figure 2, the unemployed are generally less satisfied than working individuals.

Housing

Home-ownership may have the potential to improve well-being through the provision of a stable shelter and the perception of independence and prestige associated with being a home-owner, in particular in the United States where it is considered part of the American Dream (Rohe and Stegman, 1994; Bucchianeri, 2009).

Despite the various channels through which homeownership could influence subjective well-being, there is little, and rather inconclusive evidence on the nature of this relationship. On the one hand, Parker et al., (2011) note a lack of relationship between home-ownership and family satisfaction in the UK. Similarly, taking into account household income, housing quality and health, Bucchianeri (2009) finds homeowners to be no happier than renters, and to spend less time on typically pleasurable activities such as leisure and time with friends in the United States.

On the other hand, several papers point at a positive relationship between housing and well-being. Controlling for household income, van Praag et al., (2001), using the German Socio-Economic Panel, find a positive effect of housing expenditure on housing satisfaction, which they interpret as a sign of an overall nicer and better-situated house leading to higher satisfaction. Similarly, homeowners and those giving higher ratings to their housing condition report higher levels of life satisfaction in low-income populations in Baltimore (Rohe and Stegman, 1994). Using the German Socio-Economic Panel, Zumbro (2011) finds a small though positive effect of homeownership on life satisfaction.

Using dependent variables similar to Van Praag et al., (2011), Rohe and Stegman (1994) and Zumbro (2011), we find homeowners to be on average more satisfied with their household income (Table 5), and those acquiring a home to report significantly higher levels of well-being (Table 6).

Health status

Health has throughout the literature been characterized as a determinant of subjective well-being. The direction of causality between health and well-being is, however, unclear. Helliwell (2003) uses data from the World Values Survey in 50 countries and finds significantly higher life satisfaction levels for those in good or very good self-reported health in comparison with those with lower self-reported health. However, life satisfaction could be leading to better health rather than the other way around. Besides, self-assessed health is not an objective measure of health status. Information on more objective measures of health status is somewhat more limited, however, some evidence by Dolan et al., (2008) conclude that there is a substantive negative effect of poor health status (measured through heart attacks and strokes) on subjective well-being, beyond the effect of subjective well-being itself on health.

We find time spent on health-related activities, such as visiting a doctor, taking medications or doing treatments to be associated with lower happiness, and higher levels of anxiety (Table 4). Furthermore, an improvement in self-reported health is linked to higher well-being in all domains (Table 6). Furthermore, obtaining health insurance coverage is associated with an increase in all subjective well-being domains, controlling for individual heterogeneity, self-reported health and employment status (Table 6).

We further find that disability is significantly related to lower well-being. Disabled individuals exhibit lower life satisfaction and happiness (Table 4). These findings are in line with evidence by Oswald and Powdthavee (2006), based on UK data. These findings are also in line with Lucas (2007), who shows that disability has a large and lasting causal impact on life satisfaction.

Work/life balance

There is significant evidence on the relationship between work-life balance and subjective well-being (Boarini et al., 2012). For instance, long commutes are often associated with lower levels of life satisfaction. A good work-life balance can also have a positive impact on peoples' evaluative well-being, for instance, by allowing individuals to have enough time to fulfil their needs and goals (Gropel and Kuhl, 2009).

Our data includes information on the time use of individuals' time throughout a day that can help gauge the relationship between work-life balance and subjective well-being. We find that time spent on walking or exercising, or spent with family and friends is significantly and positively correlated with overall life satisfaction as well as overall happiness experienced throughout the day. In addition, time spent walking or exercising is associated with lower levels of anxiety (Table 4, last column). Furthermore, based on the daily report of respondents' work hours, we constructed an indicator for workers who would work more than 50 hours per week. People working more than 50 hours per week clearly face challenges to have a satisfactory work-life balance (OECD, 2014). We find those workers display higher levels of anxiety (Table 4, last column), which confirms findings by Guzi and de Pedraza for Spain (2013).

Education and skills

As with income, most studies find a strong positive correlation between better education and skills and greater well-being. However, assessing the relationship between education and well-being is challenging and the evidence is mixed in studies that control for other factors. First, little to no variation is observed in education measures when controlling for individual characteristics that do not change over the course of the data sample, such as in the model reported in Table 6. Second, unobservable, or other variables such as income or health, are likely to confound the relationship between education and subjective well-being (Dolan, Peasgood and White, 2008).

Bearing in mind these caveats, we find a positive relationship between measures capturing if an individual has completed her undergraduate or graduate studies and satisfaction with income or with daily activities (Table 5). These effects are, however, not robust to the inclusion of self-reported health, which underlines the discussion in the literature that the effect of education on subjective well-being may be mediated by its impact on other variables, including health status.

Civic engagement

Civic engagement is generally considered to be important to life satisfaction. For instance, Frey and Stutzer (2000) find a strong relationship between the degree of democratic participation and life satisfaction in Swiss Cantons, although subsequent work has cast some doubt on the strength of this relationship (Dolan, Peasgood and White, 2006). Boarini et al., (2012) find that civic engagement is positively related to life satisfaction. In the US, work by Helliwell, Huang and Wong (2013), shows higher

life satisfaction levels in US communities with greater social engagement. They use an indicator for social capital in US metropolitan areas which includes the percentage of people volunteering, donating and voting.

Using registration as a voter as an indicator of civic engagement, we find the latter to be positively correlated with happiness (Table 5). While registration as a voter is perhaps not the best existing measure to capture civic and political engagement, for instance the Better Life Initiative uses voter participation instead, in the United States voter registration is the responsibility of the individual, as there is no automatic registration. It can thus be argued that those taking the decision to register for voting are more engaged civically and politically than those that do not. Voting is perhaps the greatest means citizens have for civic engagement and to participate one must be registered. Indeed, surveys of civic engagement in the United States often use registration as a voter as an indicator of civic and political engagement (see, for instance, Rutgers, 2014).

Conclusion

In this study, we use the American Life Panel to study the relationship between subjective well-being and the well-being dimensions included in the OECD Better Life Initiative. In particular the focus of this study is on income, employment, housing, health status, work-life balance, education and civic engagement in the United States, which are the areas covered by the data. The results appear to be in line with the existing literature on subjective well-being. For instance, we find income to be a significant determinant of subjective well-being when measured using different measures of subjective well-being. A person employment status also plays a role. The retired show higher well-being levels, while being unemployed or disabled is associated with lower subjective well-being. We further confirm prior findings on the importance of health for well-being. Self-reported health is an important factor throughout all the dimensions of subjective well-being we study.

This paper further contributes to the literature that tries to understand the determinants of subjective well-being by investigating the relationship between well-being and the following less explored domains: housing, health insurance, work-life balance, and civic engagement. In this respect, we find that homeowners, registered voters and those with access to health insurance have higher levels of subjective well-being. Additionally, we investigate how people's time use impacts on their subjective well-being. We find that time spent walking or exercising is positively correlated with happiness. On the other hand, working more than 50 hours per week or spending time on health-related activities is negatively correlated with subjective well-being.

Table 1. Data sample characteristics

(Share of total unless indicated otherwise)

		Mean	SD
Gender	Male	0.42	0.49
Age	Average age	51.82	14.78
	Less than 25	0.04	0.19
	Between 25 and 34	0.12	0.33
	Between 35 and 44	0.13	0.34
	Between 45 and 64	0.52	0.50
	Older than 65	0.19	0.39
Marital status	Married	0.66	0.47
	Separated or divorced	0.15	0.35
	Widowed	0.05	0.22
	Never married	0.14	0.35
Education	High school or less	0.19	0.39
	Some college	0.37	0.48
	BA or BS	0.25	0.44
	Graduate	0.19	0.39
Ethnicity	White	0.86	0.35
	Black	0.06	0.24
	Hispanic	0.06	0.23
	Asian	0.02	0.13
	Other	0.01	0.11
Income	Less than 15 000	0.08	0.27
	15 000 to 24 999	0.08	0.27
	25 000 to 34 999	0.11	0.31
	35 000 to 49 999	0.17	0.38
	50 000 to 74 999	0.22	0.42
	75 000 and more	0.34	0.47
Work status	Working	0.56	0.50
	Unemployed	0.06	0.23
	Disabled	0.05	0.22
	Retired	0.19	0.39
	Other	0.15	0.35

Source: Authors' work using data from the American Life Panel.

Table 2. Better Life Initiative covariates

(Share of total unless indicated otherwise)

	N	Mean	S.D.	Min	Max
Own a house	61 812	0.74	0.44	0	1
Owe money on house	61 812	0.51	0.50	0	1
Log income	61 812	7.71	2.05	0	24.9
Voter registration	38 493	0.90	0.30	0	1
Very good or excellent health	61 812	0.86	0.34	0	1
With health insurance	61 812	0.88	0.33	0	1
Hours watching TV	2 393	2.29	2.09	0	16
Hours walking or exercising	2 393	0.59	1.13	0	20
Hours working or volunteering	2 393	4.40	4.35	0	18.0
Hours doing health-related activities	2 393	0.26	0.92	0	12
Hours traveling or commuting	2 393	1.02	1.64	0	24
Hours with family and friends	2 393	4.41	4.86	0	24
Hours alone at home	2 393	3.33	5.01	0	24
Working more than 50h/week	2 393	0.11	0.31	0	1

Source: Authors' work using data from the American Life Panel (2009-2013).

Table 3. Subjective well-being measures

	N	Mean	S.D.	Min	Max
Life satisfaction	61 812	3.71	0.87	1 (Very dissatisfied)	5 (Very satisfied)
Satisfaction with HH income	61 800	3.13	1.08	1 (Very dissatisfied)	5 (Very satisfied)
Satisfaction with job or daily activities	61 802	3.57	0.96	1 (Very dissatisfied)	5 (Very satisfied)
Happy in last 30 days	61 795	4.31	1.07	1 (None of the time)	6 (All of the time)
Felt worn-out in last 30 days	61 806	2.73	1.18	1 (None of the time)	6 (All of the time)
Overall satisfaction with life	2 393	6.96	2.29	0	10
Happy yesterday	2 392	3.18	2.67	0 (Not at all)	10 (Completely)
Anxious yesterday	2 393	6.83	2.10	0 (Not at all)	10 (Completely)

Source: Authors' work using data from the American Life Panel (2009-2013).

Table 4. Pooled OLS models including variables on time use

	Life satisfaction	Happiness	Anxiety
Time spent watching TV	-0.0462*	-0.0594**	0.0100
	(0.0259)	(0.0276)	(0.0296)
Time spent walking or exercising	0.136***	0.200***	-0.116***
	(0.0342)	(0.0384)	(0.0435)
Working > 50h/week	0.000820	0.0608	0.419**
	(0.157)	(0.163)	(0.198)
Time spent on health-related activities	-0.0999**	-0.165***	0.156***
	(0.0462)	(0.0571)	(0.0602)
Time spent traveling or commuting	-0.0348	-0.0132	0.00635
	(0.0282)	(0.0285)	(0.0313)
Time spent with family and friends	0.0237**	0.0479***	-0.0208
	(0.00960)	(0.0102)	(0.0129)
Time spent alone at home	-0.0174	-0.0144	0.0105
	(0.0110)	(0.0114)	(0.0141)
Control for gender	Yes	Yes	Yes
Control for age	Yes	Yes	Yes
Control for marital status	Yes	Yes	Yes
Some college	0.205	0.227	-0.232
	(0.159)	(0.171)	(0.183)
BA or BS	0.404**	0.339*	-0.152
	(0.171)	(0.183)	(0.203)
Master's to PhD	0.393**	0.210	-0.0436
	(0.192)	(0.206)	(0.222)
Control for ethnicity	Yes	Yes	Yes
< USD 15 000	-1.270***	-0.802***	-0.0928
	(0.301)	(0.309)	(0.309)
USD 15 000 to USD 25 000	-1.221***	-0.625***	0.511**
	(0.236)	(0.230)	(0.252)
USD 25 000 to USD 35 000	-0.914***	-0.874***	0.696***
	(0.203)	(0.227)	(0.248)
USD 35 000 to USD 50 000	-0.757***	-0.518***	0.276
	(0.151)	(0.161)	(0.197)
USD 50 000 to USD 75 000	-0.213*	-0.245*	0.196
	(0.125)	(0.143)	(0.170)
Unemployed	-0.850***	-0.470*	0.454
	(0.271)	(0.246)	(0.305)
Disabled	-0.999***	-1.056***	0.399
	(0.279)	(0.298)	(0.324)
Retired	0.793***	0.782***	-0.541***
	(0.149)	(0.164)	(0.201)
Student	-0.0465	-0.240	0.0961
	(0.507)	(0.508)	(0.949)
Homemaker	0.581***	0.433*	-0.452
	(0.199)	(0.222)	(0.285)
Number of children	-0.138***	-0.0969*	0.0979
	(0.0489)	(0.0531)	(0.0647)
Controls for wave	Yes	Yes	Yes
Constant	7.016***	6.609***	2.948***
	(0.712)	(0.744)	(0.791)
Observations	2,393	2,393	2,393
R-squared	0.188	0.124	0.052

Note: Estimation with pooled sample, standard errors clustered at the individual level. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Estimated using 2 waves of data collected at a minimum of 2 weeks apart in 2012. The results are robust to excluding the education variables, which are typically highly correlated with income. The reference groups for the binary variables are the following: Education: High school or less; Income: More than USD 75 000; Employment status: Working for pay.

Table 5. Pooled OLS models using different variables measuring subjective well-being

	Life satisfaction	HH income satisfaction	Satisfaction with job or daily activities	Frequency of being happy in last 30 days	Frequency of feeling worn out in last 30 days
Male	-0.0308	0.122**	-0.0458	-0.00489	-0.180***
	(0.0419)	(0.0553)	(0.0457)	(0.0576)	(0.0619)
Age < 25	0.427***	0.307*	0.241	0.440***	0.00314
	(0.131)	(0.171)	(0.169)	(0.163)	(0.200)
Age between 25 and 35	0.313***	0.256**	0.228**	0.261**	0.121
	(0.0928)	(0.124)	(0.106)	(0.125)	(0.161)
Age between 35 and 45	0.149*	0.0757	0.0185	0.113	-0.0642
	(0.0787)	(0.113)	(0.100)	(0.106)	(0.132)
Age between 45 and 65	0.0854	-0.00821	0.0662	0.0754	-0.107
	(0.0548)	(0.0720)	(0.0613)	(0.0743)	(0.0913)
Married or marriage-like	0.416***	0.462***	0.331***	0.345***	-0.0913
	(0.0606)	(0.0762)	(0.0642)	(0.0829)	(0.0835)
Widowed	0.374***	0.589***	0.399***	0.329**	-0.129
	(0.105)	(0.119)	(0.107)	(0.141)	(0.174)
Never married	0.0984	0.101	0.0860	0.0994	-0.117
	(0.0914)	(0.115)	(0.0999)	(0.127)	(0.124)
Some college	-0.0258	-0.0452	0.0165	0.125	-0.0228
	(0.0599)	(0.0847)	(0.0662)	(0.0842)	(0.0917)
Bachelor	0.116*	0.224***	0.161**	0.274***	-0.190**
	(0.0623)	(0.0867)	(0.0696)	(0.0886)	(0.0952)
Graduate degree	0.111	0.299***	0.131*	0.0890	-0.0407
	(0.0688)	(0.0924)	(0.0751)	(0.0955)	(0.106)
White	0.301*	0.577**	0.455*	0.164	-0.685**
	(0.171)	(0.229)	(0.260)	(0.326)	(0.341)
Black	0.473**	0.768***	0.729***	0.405	-0.975***
	(0.191)	(0.254)	(0.277)	(0.344)	(0.358)
Hispanic	0.215	0.275	0.429	0.336	-0.740*
	(0.218)	(0.302)	(0.302)	(0.357)	(0.412)
Asian	-0.0500	0.364	0.199	0.0291	-0.393
	(0.245)	(0.286)	(0.301)	(0.382)	(0.405)
Registered to vote	0.103	0.156	0.137*	0.295***	-0.0466
	(0.0719)	(0.0981)	(0.0822)	(0.103)	(0.109)
Number of children	-0.0328	-0.0569**	-0.0250	-0.0261	0.0644**
	(0.0213)	(0.0269)	(0.0226)	(0.0283)	(0.0326)
Unemployed	-0.457***	-0.783***	-0.981***	-0.321***	-0.0940
	(0.0850)	(0.0966)	(0.0958)	(0.105)	(0.102)
Disabled or sick	-0.658***	-0.517***	-0.913***	-0.958***	1.277***
	(0.124)	(0.139)	(0.128)	(0.149)	(0.155)
Retired	0.221***	0.385***	0.296***	0.267***	-0.225**
	(0.0537)	(0.0702)	(0.0589)	(0.0712)	(0.0903)
Student	0.0943	-0.367**	0.0823	-0.0747	-0.265
	(0.135)	(0.174)	(0.140)	(0.199)	(0.165)
Homemaker	0.0987	0.230*	0.197**	0.157	-0.354**
	(0.0871)	(0.128)	(0.0863)	(0.100)	(0.150)
Control for State	Yes	Yes	Yes	Yes	Yes
Control for Month and Year	Yes	Yes	Yes	Yes	Yes
Constant	3.185***	2.629***	3.012***	3.198***	4.762***
	(0.207)	(0.282)	(0.288)	(0.363)	(0.387)
Observations	38,320	40,160	40,162	40,158	40,162
R-squared	0.163	0.203	0.190	0.136	0.125

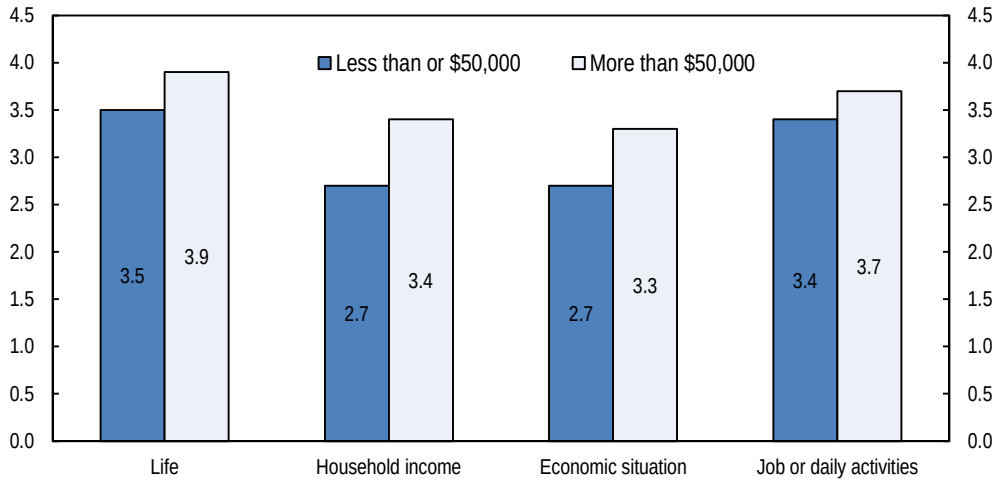
Note: Estimation with pooled sample, errors clustered at the individual level. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Estimated using 2 waves of data collected at a minimum of 2 weeks apart over 2009 to 2013. The results are robust to using a balanced panel of data across the regressions. The reference categories for the binary variables are the following: Age: 65 +, Marital status: Separated or divorced, Education: High school or less, Ethnicity: Other.

Table 6. Fixed effects OLS models using different variables measuring subjective well-being

	Life satisfaction	HH income satisfaction	Satisfaction with job or daily activities	Frequency of being happy in last 30 days	Frequency of feeling worn out in last 30 days
Own house	0.0964***	0.0906***	0.102***	0.0454**	0.0246
	(0.0191)	(0.0195)	(0.0211)	(0.0220)	(0.0246)
Owing money on house	-0.0279*	-0.0513***	-0.0603***	-0.0294*	0.00910
	(0.0149)	(0.0152)	(0.0165)	(0.0172)	(0.0193)
Log income	0.0103***	0.0209***	0.00819***	0.00927***	3.04e-06
	(0.00170)	(0.00173)	(0.00188)	(0.00196)	(0.00219)
(Very) good or excellent health	0.340***	0.176***	0.297***	0.412***	-0.436***
	(0.0112)	(0.0114)	(0.0124)	(0.0129)	(0.0145)
Having health insurance	0.0275**	0.0358***	0.0335**	0.00347	0.0561***
	(0.0132)	(0.0135)	(0.0146)	(0.0152)	(0.0171)
Working for pay	0.196***	0.183***	0.260***	0.130***	0.0743*
	(0.0315)	(0.0321)	(0.0350)	(0.0365)	(0.0407)
Unemployed	-0.163***	-0.350***	-0.456***	-0.0922**	0.000798
	(0.0329)	(0.0336)	(0.0365)	(0.0381)	(0.0426)
Disabled or sick	0.0973**	0.00351	0.0255	-0.0427	0.210***
	(0.0387)	(0.0395)	(0.0430)	(0.0448)	(0.0501)
Retired	0.165***	0.0935***	0.297***	0.158***	-0.0551
	(0.0351)	(0.0358)	(0.0389)	(0.0406)	(0.0454)
Homemaker	0.0976**	0.0466	0.152***	0.0738	0.0149
	(0.0388)	(0.0396)	(0.0431)	(0.0449)	(0.0502)
Student	0.184***	-0.109**	0.239***	0.0601	-0.0211
	(0.0432)	(0.0441)	(0.0479)	(0.0499)	(0.0559)
Controls for wave	Yes	Yes	Yes	Yes	Yes
Constant	3.209***	2.633***	3.039***	3.773***	3.011***
	(0.0396)	(0.0404)	(0.0439)	(0.0458)	(0.0512)
Observations	61,812	61,808	61,809	61,802	61,813
R-squared	0.039	0.037	0.055	0.025	0.022
Number of individuals	3,221	3,221	3,221	3,221	3,221

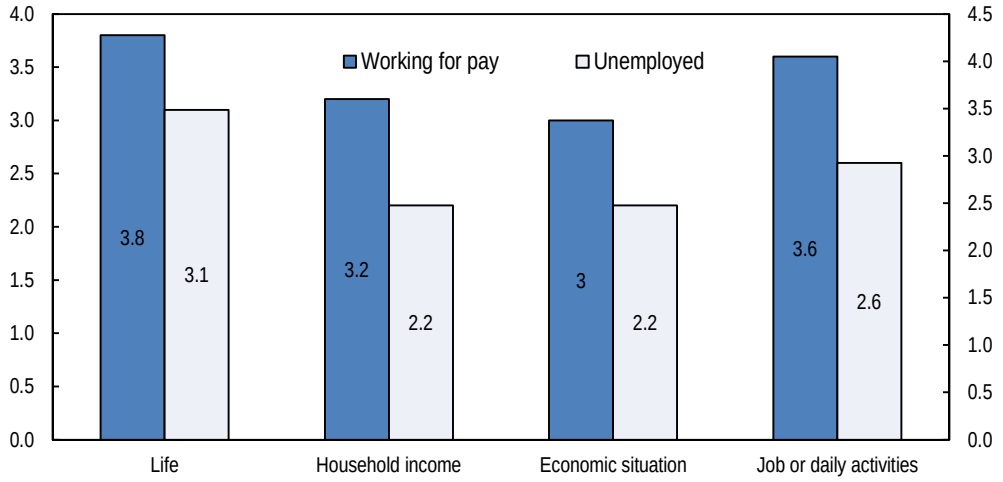
Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. Estimations with individual fixed effects and controls for wave. Estimated using 2 waves of data collected at a minimum of 2 weeks apart over 2009 to 2013. The results are robust to using a balanced panel of data across the regressions.

Figure 1. Satisfaction levels for households with income equal or lower than USD 50 000 and those with more than USD 50 000



Source: The American Life Panel.

Figure 2. Satisfaction levels for individuals by employment status



Source: The American Life Panel.

BIBLIOGRAPHY

Banks, J., A. Kapteyn, J. Smith and A. van Soest (2008), "Work Disability is a Pain in the *****, Especially in England, The Netherlands, and the United States", in D.M. Cutler and D.A. Wise (eds.), *Health at Older Ages. The Causes and Consequences of Declining Disability among the Elderly*, Chicago University Press, pp. 251-293.

Boarini, R., M. Comola, C. Smith, R. Manchin, and F. De Keulenaer (2012), "What Makes for a Better Life? (2012): The Determinants of Subjective Well-being in OECD Countries–Evidence from the Gallup World Poll", *OECD Statistics Working Paper*, No. 2012/3, OECD Publishing.

Boyce, C. J. (2011), "Understanding Fixed Effects in Human Well-being", *Journal of Economic Psychology,* 31(1): pp. 1-16.

Bricker, J., B. Bucks, A. Kennickell, T. Mach, and K. Moore (2011), "Surveying the Aftermath of the Storm: Changes in Family Finances from 2007 to 2009", Division of Research & Statistics and Monetary Affairs, Federal Reserve Board.

Brown, J. R., A. Kapteyn, and O. S. Mitchell (2011), "Framing Effects and Expected Social Security Claiming Behaviour", *National Bureau of Economic Research Working Paper,* No. 17018.

Bucchianeri, G. W (2009), "The American Dream or the American Delusion? The Private and External Benefits of Homeownership". *Wharton School of Business Working Paper Series*.

Clark, A. E., and A. J. Oswald (1994), "Unhappiness and Unemployment", *Economic Journal,* 104(424): pp. 648-59.

Deaton, A., and A. A. Stone (2013). "Two Happiness Puzzles." *The American Economic Review,* 103(3): pp. 591-597.

Delavande, A., and C. Manski (2010), "Probabilistic Polling and Voting in the 2008 Presidential Election: Evidence from the American Life Panel", *Public Opinion Quarterly*, 3: pp. 433-459.

Di Tella, R., J. Haisken-De New, and R. MacCulloch (2010), "Happiness Adaptation to Income and to Status in an Individual Panel", *Journal of Economic Behavior & Organization,* 76(3): pp. 834-852.

Diener, E., D. Kahneman, and J. Helliwell (2010*), International Differences in Well-being*, Oxford University Press.

Diener, E. (2009), "Subjective Well-being", in *The Science of Well-being*, pp. 11-58. Springer Netherlands.

Dolan P., T. Peasgood and M. White (2008), "Do We Really Know What Makes Us Happy? A Review of the Economic Literature on the Factors Associated with Subjective Well-being", *Journal of Economic Psychology*, 29: pp. 94-122.

Easterlin, R. (1974), "Does Economic Growth Improve the Human Lot? Some Empirical Evidence," in P. A. David and M. W. Reder (Eds.), Nations and Households in Economic Growth: Essays in Honour of Moses Abramovitz , New York and London: Academic Press.

Easterlin, R. (1995), "Will Raising the Incomes of All Increase the Happiness of All." *Journal of Economic Behavior & Organization*, 27(1): pp. 35-47.

Easterlin, R. L. Mcvey, M. Switek, O. Sawangfa and J. Zweig (2010), "The Happiness-Income Paradox Revisited", *Proceedings of the National Academy of Sciences*, 107(52): pp. 22463-22468.

Ferrer-i-Carbonell, A. and P. Frijters (2004), "How Important is Methodology for the Estimates of the Determinants of Happiness?", *The Economic Journal,* 114(497): pp. 641-659.

Fleche, S., C. Smith, and P. Sorsa (2011), "Exploring the Determinants of Subjective Well-being in OECD Countries", *OECD Economics Department Working Papers*, No. 921, OECD Publishing.

Frey, B. S., and A. Stutzer (2002), "What Can Economists Learn From Happiness Research?", *Journal of Economic literature,* 40(2): pp. 402-435.

Frijters, P., J. P. Haisken-DeNew, and M. A. Shields (2004), "Money Does Matter! Evidence From Increasing Real Income and Life Satisfaction in East Germany Following Reunification", *The American Economic Review,* 94(3): pp. 730-740.

Gardner, J. and A. J. Oswald (2007), "Money and Mental Well-being: A Longitudinal Study of Medium-sized Lottery Wins", *Journal of Health Economics,* 26(1): pp. 49-60.

Graham, C. and S. Pettinato (2002), "Frustrated achievers: Winners, Losers and Subjective Well-being in New Market Economies", *Journal of Development Studies* 38(4): pp. 100-140.

Gutsche, T. and A. Kapteyn, E. Meijer, and B. Weerman (2013), "The RAND Continuous 2012 Presidential Election Poll", *CESR Working Paper* No. 2013-003.

Guzi, M. and P. De Pedraza (2013), "A Web Survey Analysis of the Subjective Well-being of Spanish Workers", *IZA Discussion Paper*s No. 7618.

Hagerty, M. R. and R. Veenhoven (2003), "Wealth and Happiness Revisited–Growing National Income Does Go with Greater Happiness", *Social Indicators Research,* 64(1): pp. 1-27.

Hamermesh, D. S., H. Frazis, and J. Stewart (2005), "Data Watch: The American Time Use Survey", *The Journal of Economic Perspectives,* 19(1): pp. 221-232.

Helliwell, J. F. (2003), "How's life? Combining Individual and National Variables to Explain Subjective Well-being", *Economic Modelling,* 20(2): pp. 331-360.

Helliwell, J., R. Layard, and J. Sachs (2013), *World Happiness Report 2013*, UN Sustainable Development Solutions Network, New York.

Hurd, M. D., and S. Rohwedder (2010*), "*Effects of the Financial Crisis and Great Recession on American Households", *National Bureau of Economic Research, NBER Working Paper* No. 16407.

Kahneman, D. and A. Deaton (2010), "High Income Improves Evaluation of Life but not Emotional Well-being", *Proceedings of the National Academy of Sciences,* 107(38): pp. 16489-16493.

Kapteyn, A., J. Lee, C. Tassot, H. Vonkova, and G. Zamarro (2013), "Dimensions of Subjective Well-being", *CESR Working Paper series* 2013, No. 005.

Knight, J., L. Song, and R. Gunatilaka (2009), "Subjective Well-being and Its Determinants in Rural China", *China Economic Review,* 20(4): pp. 635-649.

Layard, R., A. Clark and C. Senik (2012), "The Causes of Happiness and Misery", in J. Helliwell, R. Layard and J. Sachs (Eds.), *World Happiness Report* 2012. New York: UN Sustainable Development Solutions Network.

Lucas R. (2007), "Long-Term Disability Is Associated with Lasting Changes in Subjective Well-being: Evidence from Two Nationally Representative Longitudinal Studies." *Journal of Personality and Social Psychology*, 92(4): pp. 717-730.

Luhmann, M., W. Hofmann, M. Eid, and R. E. Lucas (2012), "Subjective Well-being and Adaptation to Life Events: a Meta-analysis", *Journal of Personality and Social Psychology* 102(3): p. 592.

Lusardi, A. and O. S. Mitchell (2007), "Financial Literacy and Retirement Planning: New Evidence From the Rand American Life Panel", *CFS Working Paper* No. 2007/33.

OECD (2013), *OECD Guidelines on Measuring Subjective Well-being*, OECD Publishing.

Oswald, A. J., and N. Powdthavee (2008), "Does Happiness Adapt? A Longitudinal Study of Disability with Implications for Economists and Judges", *Journal of Public Economics* 92(5): pp. 1061-1077.

Parker, L., D. Watson, and R. Webb (2011), "Family Fortunes: Gender-based Differences in the Impact of Employment and Home Characteristics on Satisfaction Levels", *The Journal of Socio-Economics,* 40: pp. 259-264.

Rohe, W. M., and M. A. Stegman (1994), "The Effects of Homeownership: on the Self-esteem, Perceived Control and Life Satisfaction of Low-income People", *Journal of the American Planning Association*, 60(2): pp. 173-184.

Rutgers (2014), "Civic Engagement Index", Rutgers School of Public Affairs and Administration, Civic Engagement, 1(1).

Ryff, C. and B. Singer (2008), "Know Thyself and Become What You Are: A Eudaimonic Approach to Psychological Well-being", *Journal of Happiness Studies,* 9(1): pp. 13-39.

Sacks, D. W., B. Stevenson, and J. Wolfers (2012), "The New Stylized Facts about Income and Subjective Well-being", *Emotion,* 12(6): p. 1181.

Sacks, D. W., B. Stevenson, and J. Wolfers (2013), "Growth in Income and Subjective Well-being Over Time", *mimeo*.

Stevenson, B. and J. Wolfers (2013), "Subjective Well-being and Income: Is There Any Evidence of Satiation?", *American Economic Review*, 103(3): pp. 598-604.

Stevenson, B. and J. Wolfers (2008), "Economic Growth and Subjective Well-being: Reassessing the Easterlin Paradox", *National Bureau of Economic Research Working Paper,* No. 14282.

Strack, F., L. L. Martin, and N. Schwarz (1988), "Priming and Communication: Social Determinants of Information Use in Judgments of Life Satisfaction." *European Journal of Social Psychology* 18(5): pp. 429-442.

Van Praag, B. M. S., P. Frijters, and A.Ferrer-i-Carbonell (2003), "The Anatomy of Subjective Well-being." *Journal of Economic Behavior & Organization,* 51(1): pp. 29-49.

Zumbro, T. "The Relationship Between Homeownership and Life Satisfaction in Germany", *Housing Studies,* forthcoming, pp. 1-20.

ANNEX

Tabe A.1. Pooled ordinary logit models including variables on time use

	Life satisfaction	Happiness	Anxiety
Time spent watching TV	.	-0.0529**	0.0161
	(0.0225)	(0.0216)	(0.0210)
Time spent walking or exercising	0.135***	0.159***	-0.0718**
	(0.0331)	(0.0355)	(0.0293)
Working > 50h/week	-0.00116	0.0375	0.195
	(0.156)	(0.143)	(0.145)
Time spent on health-related activities	-0.119***	-0.142***	0.105***
	(0.0428)	(0.0462)	(0.0403)
Time spent traveling or commuting	-0.0432	-0.0273	0.0152
	(0.0267)	(0.0232)	(0.0209)
Time spent with family and friends	0.0249**	0.0395***	-0.0121
	(0.00981)	(0.00923)	(0.00953)
Time spent alone at home	-0.0177*	-0.0140	0.0107
	(0.0103)	(0.00948)	(0.00984)
Control for gender	Yes	Yes	Yes
Control for age	Yes	Yes	Yes
Control for marital status	Yes	Yes	Yes
Some college	0.139	0.155	-0.125
	(0.148)	(0.141)	(0.128)
BA or BS	0.262	0.159	-0.0597
	(0.162)	(0.152)	(0.140)
Master's to PhD	0.359**	0.132	0.0148
	(0.177)	(0.169)	(0.151)
Control for ethnicity			
<USD 15 000	-1.174***	-0.624**	-0.0254
	(0.298)	(0.266)	(0.217)
USD 15 000 to USD 25 000	-1.196***	-0.592***	0.381**
	(0.216)	(0.190)	(0.173)
USD 25 000 to USD 35 000	-0.847***	-0.700***	0.483***
	(0.192)	(0.183)	(0.173)
USD 35,000 to USD 50 000	-0.782***	-0.457***	0.218*
	(0.143)	(0.138)	(0.131)
USD 50 000 to USD 75 000	-0.254**	-0.195	0.149
	(0.122)	(0.121)	(0.117)
Unemployed	-0.679***	-0.679***	-0.679***
	(0.249)	(0.249)	(0.249)
Disabled	-0.807***	-0.807***	-0.807***
	(0.232)	(0.232)	(0.232)
Retired	0.761***	0.761***	0.761***
	(0.159)	(0.159)	(0.159)
Student	-0.0410	-0.0410	-0.0410
	(0.564)	(0.564)	(0.564)
Homemaker	0.623***	0.623***	0.623***
	(0.220)	(0.220)	(0.220)
Number of children	-0.130***	-0.0839**	0.0564
	(0.0433)	(0.0421)	(0.0432)
Control for wave	Yes	Yes	Yes
Observations	2,393	2,393	2,393

Note: Estimation with pooled sample, errors clustered at the individual level. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Estimated using 2 waves of data collected at a minimum of 2 weeks apart over 2009 to 2013. The results are robust to excluding the education variables, which are typically highly correlated with income. The reference categories for the binary variables are the following: Age: 65 +, Marital status: Separated or divorced, Education: High school or less, Ethnicity: Other.

Table A.2. Pooled ordinary logit models using different variables measuring subjective well-being

	Life satisfaction	HH income satisfaction	Satisfaction with job or daily activities	Frequency of being happy in last 30 days	Frequency of feeling worn out in last 30 days
Male	-0.0753	0.202*	-0.113	0.0117	-0.292***
	(0.111)	(0.114)	(0.108)	(0.115)	(0.108)
Age < 25	1.042***	0.525	0.513	0.716**	-0.0280
	(0.361)	(0.338)	(0.393)	(0.339)	(0.361)
Age between 25 and 35	0.743***	0.419	0.492*	0.473*	0.151
	(0.259)	(0.259)	(0.259)	(0.269)	(0.282)
Age between 35 and 45	0.340	0.111	0.0821	0.169	-0.108
	(0.214)	(0.240)	(0.237)	(0.221)	(0.235)
Age between 45 and 65	0.230	-0.0614	0.171	0.152	-0.198
	(0.152)	(0.157)	(0.153)	(0.160)	(0.161)
Married or marriage-like	1.086***	0.902***	0.762***	0.639***	-0.130
	(0.150)	(0.148)	(0.144)	(0.158)	(0.147)
Widowed	0.995***	1.200***	0.940***	0.758**	-0.359
	(0.281)	(0.251)	(0.261)	(0.295)	(0.279)
Never married	0.240	0.233	0.215	0.215	-0.191
	(0.222)	(0.230)	(0.226)	(0.244)	(0.222)
Some college	-0.0379	-0.0798	0.0597	0.237	-0.0517
	(0.159)	(0.172)	(0.152)	(0.167)	(0.162)
Bachelor	0.333**	0.456**	0.405**	0.531***	-0.334**
	(0.168)	(0.181)	(0.162)	(0.180)	(0.168)
Graduate degree	0.365*	0.624***	0.367**	0.173	-0.100
	(0.187)	(0.197)	(0.178)	(0.186)	(0.182)
White	0.787**	1.027**	0.956*	0.230	-1.067*
	(0.399)	(0.414)	(0.499)	(0.624)	(0.592)
Black	1.175**	1.309***	1.514***	0.663	-1.496**
	(0.459)	(0.471)	(0.558)	(0.670)	(0.629)
Hispanic	0.608	0.511	0.938	0.569	-1.247*
	(0.523)	(0.566)	(0.621)	(0.692)	(0.744)
Asian	-0.151	0.572	0.311	-0.00277	-0.592
	(0.593)	(0.535)	(0.597)	(0.744)	(0.702)
Registered to vote	0.218	0.314	0.278	0.526***	-0.107
	(0.184)	(0.198)	(0.179)	(0.195)	(0.198)
Number of children	-0.0848	-0.105*	-0.0702	-0.0592	0.118**
	(0.0537)	(0.0548)	(0.0518)	(0.0558)	(0.0564)
Unemployed	-1.054***	-1.501***	-1.952***	-0.585***	-0.133
	(0.190)	(0.197)	(0.191)	(0.195)	(0.192)
Disabled or sick	-1.434***	-0.971***	-1.809***	-1.678***	2.000***
	(0.269)	(0.275)	(0.262)	(0.266)	(0.262)
Retired	0.535***	0.743***	0.637***	0.506***	-0.362**
	(0.150)	(0.154)	(0.148)	(0.154)	(0.159)
Student	0.258	-0.699**	0.142	-0.216	-0.393
	(0.413)	(0.317)	(0.357)	(0.387)	(0.345)
Homemaker	0.242	0.473*	0.390	0.236	-0.675***
	(0.267)	(0.267)	(0.240)	(0.228)	(0.256)
Control for State	Yes	Yes	Yes	Yes	Yes
Control for Month and Year	Yes	Yes	Yes	Yes	Yes
Observations	38,320	40,160	40,162	40,158	40,162

Note: Estimation with pooled sample, errors clustered at the individual level. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Estimated using 2 waves of data collected at a minimum of 2 weeks apart over 2009 to 2013. The results are robust to using a balanced panel of data across the regressions. The reference categories for the binary variables are the following: Age: 65 +, Marital status: Separated or divorced, Education: High school or less, Ethnicity: Other.

Table A.3. Fixed effect ordinary logit models using different variables measuring subjective well-being

	Life satisfaction	HH income satisfaction	Satisfaction with job or daily activities	Frequency of being happy in last 30 days	Frequency of feeling worn out in last 30 days
Own house	0.464***	0.731***	0.462***	0.248***	-0.161
	(0.075)	(0.078)	(0.072)	(0.074)	(0.069)
Owing money on house	-0.126	-0.358***	-0.226***	-0.138**	0.128
	(0.062)	(0.063)	(0.058)	(0.061)	(0.057)
Log income	0.047***	0.095***	0.037***	0.034***	-0.002
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
(Very) good or excellent health	1.428***	0.803***	1.111***	1.398***	-1.331
	(0.047)	(0.048)	(0.045)	(0.045)	(0.043)
Having health insurance	0.189***	0.265***	0.162***	0.043	0.047
	(0.055)	(0.056)	(0.053)	(0.054)	(0.051)
Working for pay	0.718***	0.671***	0.954***	0.425***	0.160
	(0.138)	(0.138)	(0.132)	(0.137)	(0.127)
Unemployed	-0.065***	-1.422***	-1.366***	-0.341**	-0.067
	(0.144)	(0.145)	(0.138)	(0.143)	(0.133)
Disabled or sick	0.048	-0.257	-0.169	-0.385**	0.828
	(0.163)	(0.166)	(0.156)	(0.159)	(0.151)
Retired	0.709***	0.549***	1.201***	0.702***	-0.429
	(0.151)	(0.153)	(0.145)	(0.151)	(0.138)
Homemaker	0.545***	0.218	0.664***	0.358**	0.054
	(0.167)	(0.166)	(0.159)	(0.168)	(0.153)
Student	0.777***	-0.287	0.819***	0.195	-0.112
	(0.192)	(0.185)	(0.183)	(0.184)	(0.171)
Controls for wave	Yes	Yes	Yes	Yes	Yes
Observations	61,812	61,808	61,809	61,802	61,813
Number of individuals	3,221	3,221	3,221	3,221	3,221

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. Estimations with individual fixed effects and controls for wave. Estimated using 2 waves of data collected at a minimum of 2 weeks apart over 2009 to 2013. The results are robust to using a balanced panel of data across the regressions.

WORKING PAPERS

The full series of Economics Department Working Papers can be consulted at www.oecd.org/eco/workingpapers

1157. *Boosting the development of efficient SMEs in the Netherlands*
(August 2014) by Rafal Kierzenkowski and Jochebed Kastaneer

1156. *Making the banking sector more resilient and reducing household debt in the Netherlands*
(August 2014) by Rafal Kierzenkowski, Olena Havrylchyk and Pierre Beynet

1155. *US long term interest rates and capital flows to emerging economies*
(July 2014) by Eduardo Olaberria

1154. *Productivity measurement with natural capital and bad outputs*
(July 2014) by Nicola Brandt, Paul Schreyer and Vera Zipperer

1153. *Reducing income inequality and poverty and promoting social mobility in Korea*
(July 2014) by Randall S. Jones and Satoshi Urasawa

1152. *Fostering a creative economy to drive Korean growth*
(July 2014) by Randall S. Jones

1151. *Economic uncertainties and their impact on activity in Greece compared with Ireland and Portugal*
(July 2014) by Jan-David Schneider and Claude Giorno

1150. *Workplace stress in the United States: issues and policies*
(July 2014) by Michael Darden

1149. *Taxing the rent of non-renewable resource sectors: a theoretical note*
(July 2014) by Julien Daubanes and Saraly Andrade de Sá

1148. *Health, work and working conditions: a review of the European economic literature*
(July 2014) by Thomas Barnay

1147. *Making the best of new energy resources in the United States*
(July 2014) by Douglas Sutherland

1146. *Improving well-being in the United States*
(July 2014) by Aida Caldera Sánchez, Patrick Lenain and Sarah Fléche

1145. *Deconstructing Canada's housing markets: finance, affordability and urban sprawl*
(July 2014) by Calista Cheung
Restructurer les marchés canadiens du logement : financements, accessibilité financière et étalement urbain
(Juillet 2014) par Calista Cheung

1144. *Women's role in the Swiss economy*
(July 2014) by Richard Dutu
Le rôle des femmes dans l'économie suisse
(Juillet 2014) par Richard Dutu

1143. *Overcoming skills shortages in Canada*
(July 2014) by David Carey
Combler les pénuries de compétences au Canada
(Juillet 2014) par David Carey

1142. *Trade patterns in the 2060 world economy*
(July 2014) by Jean Chateau, Lionel Fontagné, Jean Fouré, Åsa Johansson and Eduardo Olaberria

1141. *The Demand for Skills 1995-2008: A global chain perspective*
(July 2014) by Bart Los, Marcel P. Timmer and Gaaitzen J. De Vries

1140. *International migration: The relationship with economic and policy factors in the home and destination country*
(July 2014) by Ben Westmore

1139. *Gross earning inequalities in OECD countries and major non-member economies: determinants and future scenarios*
(July 2014) by Henrik Braconier and Jenifer Valenzuela Ruiz

1136. *Long-term patterns of trade and specialisation*
(July 2014) by Asa Johansson and Eduardo Olaberria

1135. *Consequences of climate change damages for economic growth – a dynamic quantitative assessment*
(July 2014) by Rob Dellink, Elisa Lanzi, Jean Chateau, Francesco Bosello, Ramiro Parrado and Kelly de Bruin

1134. *Comparing the robustness of PAYG pension schemes*
(July 2014) by Falilou Fall

1133. *Overcoming vulnerabilities of pension systems*
(July 2014) by Falilou Fall and Debbie Bloch

1132. *Overcoming vulnerabilities of health care systems*
(July 2014) by Mauro Pisu

1131. *Overcoming vulnerability of unemployment insurance schemes*
(July 2014) by Jon Pareliussen

1130. *Vulnerability of social institutions: Lessons from the recent crisis and historical episodes*
(July 2014) by Falilou Fall, Mauro Pisu, Jon Pareliussen and Debbie Bloch

1129. *An update of the OECD international trade equations*
(June 2014) by Myriam Morin and Cyrille Schwellnus

1128. *What explains the volume and composition of trade? Industrial evidence from a panel of countries*
(June 2014) by Asa Johansson, Przemyslaw Kowalski, Eduardo Olaberria and Dario Pellegrino