Well-being During Recession in the UK

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Abstract
It has been claimed that the well-being of people in the UK remained stable during the current economic crisis. Such claims are perhaps counterintuitive given the severity of the recession. The narrative of well-being that accompanies such major events is important at a time when governments are taking non-GDP measures of well-being more seriously than before. Claims that this recession has not significantly altered people's well-being could be taken to suggest that such economic crises are not of concern from a human welfare perspective. Here we critique the conceptualisation and operationalisation of well-being as synonymous with subjective well-being (SWB). Taking a realist perspective to study change over time in well-being, we argue that a multidimensional understanding of well-being provides a valid approach for evaluating the impact of the economic crisis. To test this claim, the simple evaluative measure of SWB as life satisfaction is compared to a more objective measure of well-being. Six years of panel data for the UK working-age population are used to estimate change in individual well-being from the pre-recession 'boom' into the recessionary 'bust'. Results confirm a decline in the more objective dimension of well-being.

Key words: well-being, life satisfaction, recession, multidimensional indicator, latent factor analysis, structural equation model.

Introduction

There is a small body of work that directly addresses the question of the impact of the 2007/8 economic crisis on well-being in the UK. One piece of research by Crabtree (2010) finds that "Britons' wellbeing has neither significantly improved nor deteriorated in recent years...despite five years of economic turmoil that included the country's longest recession on record." The findings referred to in the quote were unexpected but are not isolated. A similar description of well-being through the recession can be found in the UK Office for National Statistics (ONS) narrative of personal well-being (as opposed to national well-being) (Self *et al*., 2012; ONS, 2013). The economic crisis started in late 2007 and gathered momentum into 2008, and in the UK has arguably lasted up to the time of writing. After entering the Great Recession in 2008, Myers (2012) documents the slowest recovery of GDP on record in the UK, worse even than the 1930s depression. Given the scale of the crisis, claims of stable well-being are perhaps counterintuitive.

The narrative of well-being that accompanies such major events is important at a time when governments are taking non-GDP measures of success more seriously. Claims that events such as recession do not significantly alter people's well-being could be taken to suggest that such economic crises are not of concern from a human welfare perspective. If this is true then economic crises and policy responses become primarily an issue of economic concern. However, if evidence of stable well-being does not hold up to scrutiny then such

evidence risks masking human welfare issues. In this paper we analyse these claims by critiquing the conceptualisation and operationalisation of well-being as synonymous with subjective well-being and argue for a more valid approach for evaluating the impact of the economic crisis. We ask the question, how did the recession affect more objective measures compared to subjective well-being measures in the UK working age population between 2004 and 2010? Finally, we suggest that though aggregate measures provide a starting point, the well-being impact of the recession should be understood contextually and present a brief description of how well-being trajectories differed within the UK working age population under study.

Background

Well-being and recession

Crabtree's (2010) report based on a Gallup poll highlights the stability of British people's well-being, with the score on a scale from 0-10 hovering around seven annually between 2005 and 2010. As shown by the quote in the first paragraph of this paper, the message from the report is clear: people's well-being was stable through recession. It is a similar message to that which has emerged in reports from the UK Office for National Statistics (Self *et al*., 2012; ONS, 2013) reporting of 'personal well-being'. Data from the World Database of Happiness (from 2002-2011) finds that "life satisfaction remained broadly stable throughout the last decade" (Self *et al*., 2012: 11), its mean again hovering around seven on a 0-10 scale. In *Personal Well-being in the UK* (ONS, 2013: 10), there is another description of a "picture of stability in life satisfaction in the UK," supported by data from the European Quality of Life Survey in which this measure of personal well-being is unchanged in the UK from 2007 to 2011, in contrast to other European countries.

Reports of stable well-being through economic crises are counterintuitive as there are many mechanisms through which we may expect recession to impact on well-being. These range from financial pressures and losing a job (Mandemakers and Monden, 2013; Gush *et al*., 2013) to reductions in the socially provided services (Meegan *et al*., 2014). Indeed, in the United States, Graham *et al*. (2010) find evidence that there was a U-shaped trend in happiness which coincided with the onset of the economic crisis in 2008, and bottomed out in March 2009 when the stock markets stabilised. This trend was found in very different data however, coming from a daily survey which continued for 18 months. We may also expect well-being to have fallen during the Great Recession because of evidence that well-being declined during past recessions in the UK. Clark (2011) for example documents a decline in employee well-being associated with the early 1990s recession in Britain, which it is suggested may have been due to "lower incomes, a greater overall feeling of insecurity, or more generally to feelings of empathy" (*ibid*: 136). Though no two crises are identical, studies have shown that the macroeconomic conditions we associate with economic crises are themselves associated with changed aggregate well-being. Di Tella *et al*. (2001) use repeated cross-sectional data from 12 European countries to show that, at an aggregate level, people are happier when inflation and unemployment are low, and that of these measures unemployment has the largest effect. Blanchflower (2007) also finds that interest rates are negatively associated with well-being, and in poorer countries GDP per capita is found to be positively associated.

It is not illogical therefore to challenge reports of stable well-being during the Great Recession. We question whether a particular conceptualisation and operationalisation of well-being as general life satisfaction is responsible for the narrative of stable well-being.

Measuring well-being

The concept of well-being is broad and multidimensional and as a result has been conceptualised and operationalised in a variety of ways within empirical research across and within disciplines (for the taxonomy of well-being and related concepts, see Anand *et al.*, 2009; Burchardt and Vizard, 2011; Gasper, 2010; McGillivray, 2007). In line with Gasper (2010: 353), in this paper we advocate an approach to studying well-being which recognises and values the breadth and multidimensionality of well-being. From this approach we proceed by measuring single dimensions of well-being. Focusing on specific dimensions does not imply that other outcomes cannot be good, but it offers a well-argued empirical approach to some key questions which highlight salient well-being concerns.

This approach can be contrasted with the approaches which have generated the findings that well-being remained stable during recession; findings which are based on singular 'evaluative' measures of subjective well-being (SWB), measures common within economics and psychology (Dolan *et al*., 2008). Diener *et al*. (1999: 277) describes SWB as "a general area of scientific interest rather than single specific construct," and Jivraj *et al*. (2014) suggest that evaluative SWB is one of three approaches to studying SWB (with affective and eudaimonic SWB making up the others). Furthermore, the 'general area' of SWB is itself only part of the broader concept of well-being. Crucially, we argue, it is not average well-being that has remained stable through the economic crisis, but people's average evaluations of their subjective well-being. Crabtree's (2010) analysis of well-being through recession uses a question which asks respondents how they feel about their life compared to an imagined 'best possible life for you' (the Cantril Self-Anchoring Striving Scale). A similar but more direct question is the more typical 'life satisfaction' question used as one of four 'personal well-being' subjective measures adopted by the ONS (Self *et al*., 2012; ONS, 2013): "Overall, how satisfied are you with your life nowadays?" These questions are subjective measures of subjective concepts. Not only is the measurement process subjective, but the content and scope of factors which constitute satisfaction or the 'best possible life' may well be different for each subject and change over time. Plagnol and Scott (2011) argue there is such instability , giving evidence of change over the life course and differences between genders in the conceptualisation of well-being. Sen (1987) suggests that subjective well-being measures such as happiness and life satisfaction have value in the study of well-being only if it is recognised that they are only one constituent part, since they are not the only items of value. Yet this is not how these measures are presented in the literature that aims to measure the impact of recession on well-being, and as such we suggest that some of the more positive summary statements about well-being holding steady in the UK have been misplaced.

The absence of a trend could be explained by the hedonic treadmill model developed by Brickman and Campbell (1971) which describes a process interlinked with adaptation. This model proposes that changes to individual subjective well-being are only transitory, short lived experiences, followed by a return to a set point which varies between individuals. The model has been modified more recently. Diener *et al*. (2006: 312) show that these processes

of adaptation are actually much more complex and that we are not "doomed by the hedonic treadmill". Yet there is evidence that to a large extent, in response to many events, people's subjective well-being fluctuates only temporarily, returning to a neutral state irrespective of variation in the initial external cause (recession in our case). Thus, the extent to which these subjective well-being measures vary sufficiently *for our specific research motivation* in response to external stimuli is questioned. If we instead attempt to measure the impact of an event on people's well-being by measuring 'conditions and circumstances'[1] (as opposed to cognitive and emotional states) that are dimensions of well-being grounded in a moral consensus of what constitutes a good life, we overcome the weaknesses of the single evaluative measure of subjective well-being. This does not by any means remove subjectivity from the measurement process, but it does provide a *more* objective approach because the frame of reference from which to assess well-being across people and time is comparable.

The distinction between objectivity and subjectivity can be contentious, especially when working in a multidisciplinary field. They perhaps overlap in the experience of well-being. When considering these two terms in depth it becomes increasingly difficult to treat them as a natural dichotomy and increasingly appealing to use terms which overlap and operate on multiple levels. Following Gasper (2010: 352), it is helpful to conceive of many relevant interpretations of subjectivity and objective well-being in order to overcome semantic and taxonomic limitations, thereby focussing on the context-specific distinction. Relative subjectivity is found to be deep-rooted in single evaluative measures of well-being.

In this paper, the purpose of analysis is to understand the impact the economic crisis had on people in the UK, i.e. changes in well-being associated with this event. This is necessary for governance. An understanding of how the population - and importantly for sociological explanation, subsections within it - have been affected enables informed social policy decisions. Furthermore, understanding the implications of macroeconomic change, which is manipulated through policy levers, similarly enables more informed decision making. Evaluating well-being using more objective measures meets these requirements in that these measures are less prone to adaptation, they are more readily affected by policy intervention and they can be more readily compared within and between individuals. Measures of subjective well-being could form part of a consensus of a decent life for the population, but they are by no means sufficient. Furthermore, there is evidence that subjective well-being adapts to unemployment – a more prevalent experience during recession (Burchell, 2011). A person who becomes unemployed, loses their home, lacks nourishment and is unable to carry out normal social activities may well adapt to such a point as to express an equal level of happiness as someone who has all these things. As a result, meaningful comparison over time or between people is not possible.

To assert that the well-being of the UK population remained stable during recession on the basis that life satisfaction levels did not change strongly implies that recession does not really affect peoples' lives. Yet there are plenty of indications that many lives have been substantially negatively affected. These range from increased prescriptions of medication related to depression and anxiety (Spence *et al*., 2014) to the introduction of the first Red Cross food aid campaign in the UK since the Second World War (McDonald-Gibson, 2013). Such reports suggest declining overall well-being during the current recession, which can be

and perhaps has been masked by measuring aggregate subjective well-being. How we conceptualise well-being is therefore critical to our interpretation of events.

In this paper we ask how the recession affected more objective measures compared to subjective well-being measures in the UK working age population between 2004 and 2010. It is hypothesised that the stability of well-being through recession will be dependent on how well-being is measured: more objective measures of well-being dimensions will record a decline in well-being associated with the recession period, whereas subjective measures of well-being will remain comparatively stable throughout the recession period.

Methodology

Data

Central to exploring how individual well-being has changed over time is the use of secondary longitudinal data that covered the period of the recession. This was provided by Understanding Society (USoc (ISER)) and the British Household Panel Survey (BHPS (ESRC)). These large scale surveys use an annual panel design and are therefore especially well suited to analysing how people experience and respond to change in their socioeconomic environment (Taylor *et al*., 2010). The BHPS ended in 2008 being replaced by USoc which is a different but complimentary survey which incorporates the BHPS sample within it. This has to some extent enabled individual level analysis to continue, though much potentially useful data is not comparable across the two surveys. The BHPS sub-sample remains independent of the main USoc sample, therefore it is the BHPS survey design which is key to analysing the combined dataset, a detailed account of which can be found in Taylor *et al*. (2010).

Analyses are run on six survey waves from 2004 to 2010 (2009 omitted as the BHPS sub-sample are not included in this wave of USoc) with three waves in the pre-recession period and three waves in the recessionary period. The data is primarily conducted through face-to-face surveys, though a multi-instrument approach is used to increase response rates, including a self-completion questionnaire which captures one of the key variables used in this study. The population of interest is people of working age in the UK, excluding fulltime students, people who have retired and those in government training schemes. Working age is defined as 16-59 years for women and 16-64 years for men. The analysis tracks the sample from the 2004 wave over the subsequent five waves, allowing respondents to drop out and return or attrit (exit), creating an unbalanced dataset. The sample size is 10,260 respondents who provide 46,751 observations over the study period (a description of sample characteristics can be found in appendix 1).

Key variables

As mentioned above, this study takes a focussed empirical approach in which a single dimension of well-being is presented as an example which highlights the value of a contrasting approach to SWB. Focussing on salient well-being concerns individually adds to the body of work which operates within the framework of multidimensional well-being, whilst avoiding the demanding informational requirements of developing a full multidimensional measure of well-being.

The analysis compares two outcome variables: one is an evaluative measure of subjective well-being and the other is a measure of psychological health, considered here as a single dimension of well-being. The measure of subjective well-being used in this analysis is a universal assessment of life satisfaction, a comparable measure from USoc/BHPS to those used in the literature presented earlier (ONS, 2013; Self *et al*., 2012). This question asks "how dissatisfied or satisfied are you with your life overall", and respondents answer on a scale from 1 (not at all satisfied) to 7 (completely satisfied). Six respondents had item-missing data on this variable (and valid data for the psychological health variable) and were dropped from this analysis reducing N to 10,254. A summary of the *life satisfaction* variable is presented in Table 1.

The measure of psychological health is developed using a measurement model based on 6 items from the 12-item General Health Questionnaire (GHQ-12) contained in the self-completion section of the main questionnaires. Huppert and Whittington (2003) argue from a theoretical perspective that the measurement of positive psychological symptoms in the GHQ is not simply the inverse of negative psychological symptoms that are also measured. The authors put forward a strong case that the two are not only theoretically different (though clearly related), but also empirically different with regard to their distribution in the population and to related predictors. Several studies have also suggested that the factor structure of the GHQ supports a multiple factor solution (Graetz, 1991; Rajabi and Sheykhshabani, 2009; Vanhoutte, 2014). Using the GHQ-12 as a single measure of psychological health is therefore rejected in favour of the more theoretically coherent distinction between positive and negative traits. A *positive psychological health* variable was created using the six items of the GHQ-12 which measure positive traits[2]. The ordinal items were analysed using categorical confirmatory factor analysis (CFA) in Mplus to develop a measurement model and to statistically test the theorised positive construct. This was preferred over an aggregate classical scale as a measurement model does not assume error-free measurement of the latent factor (*positive psychological health*). It also does not assume interchangeability between items. The factor structure was estimated for the six waves simultaneously, with the resulting model exhibiting good fit statistics (RMSEA=0.014, CFI=0.98, TLI=0.98) providing confidence in the measurement of the underlying variable *positive psychological health*. A summary of the resulting variable is presented in Table 1. The analysis uses a two-stage approach in which the factor scores that emerge from the CFA are treated as observed variables in the latent curve model (described below). This option was preferred over the alternative of simultaneously modelling the CFA and the latent curve model in one stage. Very many parameter estimates would be needed for factor scores when combining multiple categorical observed items with six linked waves of data.

The means of the two outcome variables by wave is presented in Table 1. For *life satisfaction* no clear trend over time is observable in the bivariate values, in line with the 'stable well-being' studies discussed earlier. For *positive psychological health* there is preliminary support for the hypothesis that this variable would be relatively stable in the pre-recession period compared to the recession period.

Table 1. Description of outcome variables: *life satisfaction* and *positive psychological health*

	Life Satisfaction (S.E.)	*Positive Psychological Health* (S.E.)
At wave 1 in 2004		
Mean	5.13	0.03
Standard deviation	1.17	0.61
Minimum	1	-2.54
Maximum	7	1.94
By wave (i.e. year)		
Wave 1 mean (2004)	5.134 (0.015)	0.019 (0.008)
Wave 2 mean	5.059 (0.016)	0.019 (0.008)
Wave 3 mean	5.101 (0.016)	0.014 (0.010)
Wave 4 mean	5.116 (0.017)	0.014 (0.010)
Wave 5 mean	5.107 (0.017)	-0.021 (0.010)
Wave 6 mean (2010)	5.088 (0.026)	-0.096 (0.011)

Population aged 16-59/64 (F/M). BHPS UK sample, wave 2004 to waves 2008 and Understanding Society BHPS cohort wave 2010. Weighted estimates, standard errors adjusted for within-person dependency by multilevel structure. Life satisfaction lay on its natural scale 1-7. Positive Psychological Health lay on an approximately normal distribution curve with most cases lying from -2 to +2, and was constructed using the six ordinally measured GHQ items.

Covariates

The main purpose of covariates in this analysis is as control variables rather than having substantive interest relating to a hypothesis. The longitudinal method which follows a cohort across the study period is good for studying change, but changes in the cohort over time due to non-response, attrition and changes in sample characteristics such as ageing may introduce bias. Covariates are added to the model to act as control variables, providing greater confidence that the trajectory of change is reflective of changes in the population and not just the sample. Covariates were selected based upon relationships with well-being established in the literature. These include sex, age band, labour market status, marital status, having children living at home, educational attainment, tenure, disability and household income (details of these variables can be found in appendix 1). Many of the variables are time-varying, but have been reworked into time-constant versions for the purpose of this analysis to reduce the model and theoretical complexity. The relationships explored with time-constant covariates represent no more than associations between variables since no changes are observed with which causal mechanisms can be tested.

Modelling approach

Latent curve models (LCM), also referred to as growth curve models, are used for this analysis. The model is introduced to analyse change in the dependent variable over time where the primary cause of change in the outcome variable is conceived as a latent factor which is not directly observable (Muthén and Muthén, 2010). This model can be contrasted against an autoregressive model in which the primary cause of the outcome variable is considered to be the prior value of that variable.

Modelling change as a trajectory is appealing as it overcomes the narrow conceptualisation of change as an increment between two points (Singer and Willett 2003). It also enables measurement error to be distinguished from true change, which is not possible with only two data points (Rogosa and Willett 1985). The more points in time we have observations

for the greater the precision with which the trajectory of change can be estimated. The six waves of data therefore provide motivation for conceptualising change as a process.

The latent curve model is estimated in a structural equation model (SEM) framework. The data is held in a 'wide' multivariate outcome structure which allows the trajectory to be estimated in a single level, compared to a multilevel (MLM) approach in which the observations are nested within individuals. One benefit of the single-level SEM approach is that it allows the shape of the curve to be estimated very flexibly. Here we implement a piecewise trajectory, a variation of the linear model in which the trajectory of the outcome variable is estimated in a series of 'pieces'. The aim of this model is to test the theory that the recession period represents a change in macro conditions that one would expect to be associated with a decrease in well-being. Therefore two pieces (or slopes) are defined, one representing the pre-recession period (from 2004-2006) and the second the recession period (2007-2010). The models are estimated using Mplus' MLR maximum likelihood estimator which is robust to non-normality and is the default when a complex survey design is specified as in this case (Muthén and Muthén, 2012). The piecewise latent curve model takes the following form:

(1) $y_{ti} = \eta_{0i} + \eta_{1i}x_{1t} + \eta_{2i}x_{2t} + \varepsilon_{ti}$
(2) $\eta_{0i} = \alpha_0 + \boldsymbol{\beta_0 X}_i + \zeta_{0i}$
(3) $\eta_{1i} = \alpha_1 + \boldsymbol{\beta_1 X}_i + \zeta_{1i}$
(4) $\eta_{2i} = \alpha_2 + \boldsymbol{\beta_2 X}_i + \zeta_{2i}$

where y_{ti} is the outcomes variable at time t for person i, η_0 is the intercept factor, η_1 is the slope factor for the pre-recession period, η_2 is the slope factor for the recession period, x_{1t} and x_{2t} are respective time scores for each period, and ε is the residual term. The intercept factor can be thought of as the initial status or starting value. The slope factors are the trajectories, which progress according to the time values by which they are multiplied. In the latent curve model the values of time are the factor loadings which can be estimated or fixed. Here the time values are fixed to specify the distance between observed waves and the start and finish of each slope: 0, 1, 2, 3, 3, 3 for the first slope to represent the linear trajectory of the first piece which progresses from the intercept at $t = 0$ (2004) to transition point at $t = 3$ (2007), at which point the value remains the same until T (2010). The loadings of the second piece are 0, 0, 0, 0, 1, 3. The two trajectories are joined at the transition point ($t = 3$) by setting the first loading within the second piece to 0, then progressing linearly (with no score of 2 as there were no observations in 2009).

In equation (2), the intercept factor is defined by the mean outcome at first time point α_0, conditional on a vector of covariates $\boldsymbol{X}$ and their coefficients $\boldsymbol{\beta}$, plus an individual variance ζ_{0i}. In equations (3) and (4) the slope factors are defined by the conditional mean trajectory for the respective time period, plus the factor specific covariate structure and variance terms. This enables an initial value and trajectory for both time periods to be estimated for each covariate group. In this way, the covariates can have a different structural relationship with the outcome variable in the pre-recession period compared to the recession period. The i subscripts on the variance terms denote a random effects model, providing information about how individuals differ in initial status and trajectory from the mean.

Equation (1) assumes that the mean of ε_{ti} is zero, that the latent variables η_{0i}, η_{1i} and η_{2i} are uncorrelated with ε_{ti}, that each person has the same variance within a given time, but that residual variance can differ over time, and that residuals are not correlated over time (Bollen and Curran 2006, p20). In addition ε_{ti} is assumed to be uncorrelated with ζ_{0i}, ζ_{1i} and ζ_{2i}.

In the analysis below piecewise estimates are used to compare the trajectories of mean *life satisfaction* and *positive psychological health* across the pre-recession and recession periods. The key parameters in this analysis are the mean latent slopes, which indicate the presence or absence of significant change in well-being over time.

Results

Comparing pre-recession and recession period trajectories

Overall the regressions were a good fit and showed microdata patterns of association with well-being over time, as expected. Table 2 presents the results from the two piecewise latent curve models. The intercept, slope 1 and slope 2 parameters are interpreted conditionally upon the average of the continuous covariates and upon the reference categories of the ordinal covariates (see Table 3). For ease of interpretation, we instead take advantage of the mean intercept and slope estimates derived from the model provided by the 'tech 4' output in Mplus. For clarity these are presented in italics in Table 2. The intercept regression is similar to a grand means model, and the factors affecting the slope can be seen as those which significantly affect trajectories.

Table 2. Piecewise latent curve models for *life satisfaction* (Model 1) and *positive psychological health* (Model 2)

	Model 1. Life satisfaction[+]		Model 2. Positive psychological health[++]	
Means/intercepts	**Estimate**	**(S.E.)**	**Estimate**	**(S.E.)**
Intercept,	5.698	(0.081)	0.276	(0.049)
mean intercept[^]	*5.107*	*(0.018)*	*0.030*	*(0.008)*
Slope 1 (pre-recession)	-0.040	(0.033)	0.005	(0.022)
mean slope (slope 1)[^]	*-0.002*	*(0.006)*	*-0.002*	*(0.003)*
Slope 2 (recession)	0.063	(0.051)	-0.054*	(0.024)
mean slope (slope 2)[^]	*-0.002*	*(0.009)*	*-0.038***	*(0.004)*
Residual variances				
Intercept	0.759	(0.031)	0.187	(0.010)
Slope 1 (pre-recession)	0.038	(0.005)	0.018	(0.002)
Slope 2 (recession)	0.033	(0.009)	0.022	(0.003)
Model fit				
RMSEA		0.008		0.011
CFI		0.995		0.987
TLI		0.990		0.977

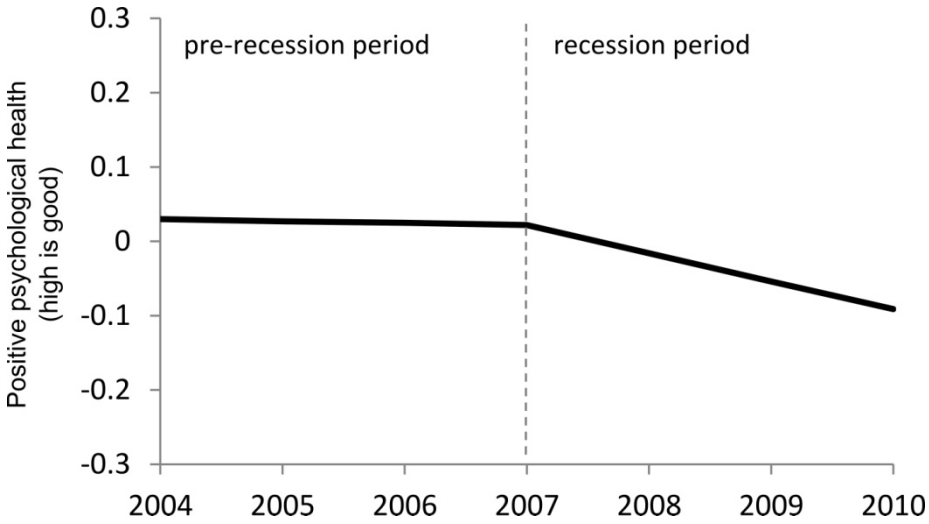
**p<0.05 **p<0.0005. [+]N=10,254; [++]N=10,260. Population aged 16-59/64 (F/M). BHPS UK sample, wave 2004 to waves 2008 and Understanding Society BHPS cohort wave 2010. Weighted estimates. [^]These are model estimated means (obtained using the 'tech 4' option in Mplus).* The model estimated means calculated in Mplus are based upon model coefficients. For example, $model\ estimated\ mean\ of\ slope\ 1 = intercept\ of\ slope\ 1 + \beta_1 * mean\ of\ \mathrm{X}_1 + \beta_2 * mean\ of\ \mathrm{X}_2 \ldots \beta_k * mean\ of\ \mathrm{X}_k$, where k is the number of covariates. It is an aggregate value which accounts for covariates, sample design and weights. Note: the covariate coefficients are presented separately.

Starting with the model for *life satisfaction* (Model 1, Table 2), no evidence is found of significant change over time in either the pre-recession period (mean slope of -0.002, S.E.=0.006) or during the recession period (mean slope of -0.002, S.E.=0.009). This pattern of stability supports both the previous research and our hypothesis. The model for *positive psychological health* (Model 2, Table 2) also shows no significant change in the pre-recession mean slope (-0.002, S.E.=0.003), though in contrast to Model 1, there is a significant decline in *positive psychological health* in the recession period (-0.038, S.E.=0.004). This further supports the hypothesis that change in this variable would be associated with the recession period. The model estimated mean trajectories for Model 1 and 2 are plotted in figures 1 and 2 respectively, with the y-axis for each graph spanning approximately one standard deviation of the respective scales.

Figure 1. Estimated mean *life satisfaction* trajectory

Note: The y-axis range covers approximately 1 standard deviation.

Figure 2. Estimated mean *positive psychological health* trajectory



Note: The y-axis range covers approximately 1 standard deviation.

In the table, measures of goodness of fit show strong support for both models fitting the data. Inferences from this sample to the population of those aged 16-59 in 2004 (or 16-64 for men in 2004) would be deemed valid given that the two fit indices take very high values such as 0.995. The root mean squared error of approximation is another measure that corroborates the good fits. These measures relate to the panel data regression with its three equations. In the background, the stage 1 latent factor analysis in Mplus which created the Model 2 dependent variable was also a very good fit.

Individual variation

Having provided evidence to challenge the narrative of stable well-being at the aggregate level, we now focus in on the model for *positive psychological health* (Model 2) and explore the individual trajectories of change over the study period, thus providing a richer description of change.

The first column of Table 3 presents the covariate coefficients relating to the intercept. The results show that lower levels of *positive psychological health* are associated with women, people in older age bands (35-49 and 50 plus), those that considered themselves disabled, and people with lower average household income. The consistently economically inactive, people who are in-and-out of employment, and people who move between unemployment and economic inactivity during the study period also have lower levels of *positive psychological health* than those who were employed across the six waves. Respondents who were consistently unemployed however, did not have significantly different results to the consistently employed (though this may be due to the small sample in this category). In total, around 55% of the variance in the intercept factor is explained by the starting value and set of covariates, leaving significant unexplained between-person variation (residual variance=0.187, S.E.=0.010). There are potentially additional systematic characteristics that could be modelled to reduce this variance, though some variance will always be expected in the random effects model due to individual idiosyncrasies.

In contrast to these covariate relationships with the intercept factor variable, the covariate relationships with both pre-recession and recession slopes were almost exclusively non-significant. This suggests that the mean trajectory in each period was largely descriptive of the mean trajectory in each category. This was expected for the pre-recession period, but for the recession period this was surprising as some groups have reportedly been more affected by the crisis than others. It may be expected, for example, that young people who have reportedly been hard hit by the economic crisis would experience a greater decline on average than other age groups. Another way of looking at these results is that the time-constant covariates did not sufficiently describe groups of people who had quantitatively different experiences of the recession. This is a weakness of the model specification, which as discussed earlier was not set up to maximise analysis of covariates.

Table 3. Covariate coefficients for Model 2, piecewise latent curve model for *positive psychological health*

	Intercept		Pre-recession slope		Recession slope	
	Estimate	**(S.E.)**	**Estimate**	**(S.E.)**	**Estimate**	**(S.E.)**
Sex: Men†						
Women	-0.063**	(0.015)	-0.005	(0.006)	-0.004	(0.007)
Age band: 16-24†						
25-34	-0.045	(0.037)	-0.006	(0.015)	0.015	(0.018)
35-49	-0.185**	(0.037)	-0.006	(0.016)	0.010	(0.018)
50-59/64	-0.211**	(0.040)	-0.007	(0.017)	0.020	(0.018)
Labour market and employment status: Employed†						
Unemployed	0.001	(0.103)	0.032	(0.045)	-0.013	(0.053)
Economically inactive	-0.231**	(0.042)	0.023	(0.017)	-0.009	(0.021)
In and out of employment	-0.081**	(0.019)	0.008	(0.009)	-0.004	(0.010)
Between unemployed and inactive	-0.183**	(0.050)	-0.018	(0.023)	-0.006	(0.022)
Children in household: No children†						
Children	-0.005	(0.020)	-0.007	(0.008)	0.011	(0.009)
Marital status: Couple†						
Single	0.027	(0.028)	0.011	(0.011)	-0.004	(0.011)
Ex-couple	-0.072	(0.039)	0.038*	(0.014)	-0.023	(0.015)
Widow/widower	-0.114	(0.076)	0.024	(0.040)	0.018	(0.060)
Educational attainment: High†						
Intermediate	-0.015	(0.020)	-0.008	(0.009)	-0.001	(0.010)
No qualifications	-0.006	(0.028)	-0.015	(0.014)	0.026	(0.015)
Tenure: Owned: outright†						
Owned: mortgage	-0.020	(0.021)	0.004	(0.009)	0.004	(0.010)
Rent: social	-0.021	(0.031)	-0.011	(0.013)	0.015	(0.015)
Rent: private/other	-0.065	(0.035)	0.016	(0.014)	-0.019	(0.018)
Disability: Not disabled†						
Considers self disabled	-0.247**	(0.044)	-0.012	(0.018)	0.007	(0.020)
Average household Income(centred) (log)	0.036*	(0.018)	0.007	(0.008)	0.007	(0.009)

† *= reference category*

**p<0.05 **p<0.0005. N=10,260. Population aged 16-59/64 (F/M). BHPS UK sample, wave 2004 to waves 2008/9 and Understanding Society BHPS cohort wave 2010. Weighted estimates. Note: The covariate table for Model 1 is presented in appendix 2 as it is not central to the research question.*

Despite the covariates not performing well, there is strong evidence that people's *positive psychological health* trajectories varied substantially from the mean over the study period. The model estimated individual trajectories (estimated from the individual variance parameters) show that 23% of the sample was estimated to have improving *positive psychological health* over the recession period (compared to 44% in the pre-recession period), with only around 1% showing no change in each period. Looking at more extreme cases, around 3.6% of respondents had an estimated trajectory which reduces their *positive psychological health* by over one standard deviation, compared to around 1% whose estimated trajectories increased by over one standard deviation. The use of model estimated individual trajectories is valid here since it offers a summary that smoothes out deviant individuals' paths but is, overall, an excellent fit to the time series data. The relatively large amount of "residual variance" compared with the variance of the slope estimates for the two slopes (pre-recession=0.018, S.E.=0.002; recession=0.022, S.E.=0.003) requires a little interpretation. It shows that cross-sectional variations in well-being in

Model 2 were not fully explained by the model whereas change over time had a good fit. This finding supports the capacity to do future investigation with a more appropriate covariate model structure. In brief, the model is parsimonious whilst offering one of the first linear growth curve estimates of well-being.

Conclusions

Factor analysis was used to create an indicator of well-being which can measure both upward and downward change. A detailed positive psychological well-being indicator, based on six well-established items from the General Health Questionnaire (GHQ), shows variation over time and across the sample in response to changes in life circumstances. The indicator's measurement parameters were stable over the time period 2004-2010 and it had a good fit to the data. The apparent constancy of well-being reported by others during the current recession may have been masking real changes. *Positive psychological health* was put forward as an example of a single dimension of well-being, set within a framework where well-being is defined more objectively and is understood as multidimensional.

The approach used here also fit linear growth curves to examine the overall average change over time. With an excellent model fit, we showed that the positive psychological health indicator did slope downward overall during the current recession. A piecewise fit was the best way to represent this, 2004-6 differing from 2007-2010. A wide range of controls were used. Life satisfaction measures, which sit in a broad class of overall evaluative subjective measures, do not show this downward slope because of widespread adaptation. The *positive psychological health* measure is more responsive. It is well placed to help us understand the impact of economic events as it is based on people's conditions and circumstances, not only on their cognitive and emotional state. The results corroborated previous research that showed that people's subjective overall assessments of their well-being remained relatively stable, on average, throughout an economic crisis.

A reduction in *positive psychological health* became the norm during the recession period. Though the mean decline is modest, there are cases where the change in positive psychological health is substantial, with 4% of cases estimated to have increased or decreased by over one standard deviation during the recession period alone. (The whole scale, as is usual when a latent factor is set up to approximate a normal distribution, runs across six standard deviations in a rough Bell curve shape.) The variation in individual trajectories, coupled with a lack of significant group-based associations, shows that the mechanisms through which the economic crisis affects people are not necessarily clearly differentiated along standard socio-demographic lines. This may point to discrete events, such as becoming unemployed, being bankrupt or having a house repossessed, driving more extreme patterns of change. Gender differences in the trajectories were muted.

Readers may be curious whether the 16+ aged youth experienced worse outcomes during the recession, but this paper cannot comment directly on that because the youngest cohort in the 2004-2010 data would have been 20+ years old entering the recession period in 2007. Further research can be carried out later on the youngest and eldest cohorts using the BHPS and Understanding Society data. The method used here brought a focus on the core working-age groups who were from age 16 to 53/58 in 2004 when our panel began (53 for

women and 58 for men). Those in the older age group, aged 54-59 in 2004 (59-64 for men) would have had incomplete data for this panel period.

The methods used here are robust to both selectively missing data and this kind of incompleteness by age-group at the panel edges. We used an unbalanced panel. Both confirmatory factor analysis and latent growth curve modelling with Mplus offer robust measures of fit in these circumstances. The methods used here are an alternative to fixed-effects longitudinal econometric models in which structural factors are often constants which 'drop out' of all estimates. Gender, education, and disability were allowed for here, whereas they are typically invisible in econometric time-series studies. Women and people who considered themselves disabled had consistently lower psychological health but they did not experience more rapid deterioration over time, compared with others.

Those who were unemployed for the whole period were very rare; those who moved in-and-out of employment had lower psychological health than the base case who had employment throughout. Here 'out of employment' refers to unemployment or economic inactivity and so it is not necessarily an exogenous change. As a result the lower *positive psychological health* shown in Model 2, Table 3 should be interpreted as an association only. The change is shown as an 'intercept factor' i.e. overall lower health, whereas the rate of decline of health was not greater than average for such people.

We did not test the thesis of re-adaptation upward after downward changes in circumstances. Instead we fit Model 1 to reflect the typical literature that rests upon assumptions about adaptation, and we fit Model 2 to reflect an alternative assumption that measures with a more objective cast (being also less socially relative, and less subjective) offer better glimpses of how people are faring. Our future research will widen the indicators used to include housing and other basic human capability measures in a multidimensional indicator (*a la* Anand, 2009). More research on adaptation can be conducted using the piecewise or adaptive linear growth curve models. Mplus software proved durable and helpful in measuring how well models fit. With its multilevel capability the software would also be applicable in international comparative contexts.

A secondary aim of the paper was to describe cross-sectional variations in the recession experience using a limited number of time-constant covariates. The 'effects' of these are to some extent hiding background structural and contextual factors. Further research into the role of labour market statuses and household structures in mediating the effects of the economic crisis on well-being can to some extent overcome this limitation. In particular, one-off events such as becoming unemployed should be distinguished carefully from a series of changes of employment status. The patterns over time should in turn ideally be tested in interaction with gender, education, and disability because these structural contexts may have moderating effects.

The well-being measure used in this paper was presented as an example. A full understanding of the well-being implications of recession necessarily requires analysis of a wider variety of well-being dimensions within an explicit framework. This is informationally demanding, but the comprehensive understanding that results will be a strength in this growing literature about well-being.

References

Anand, P., Hunter, G., Carter, I., Dowding, K., Guala, F.and Van Hees, M. (2009). The Development of Capability Indicators. *Journal of Human Development and Capabilities*, **10** (1), 125–152.

Blanchflower, D. G. (2007). Is Unemployment More Costly Than Inflation? *NBER Working Paper Series*, 13505.

Brickman, P. D. and Campbell, D. T. (1971). Hedonic relativism and planning the good society. In M. H. Appley (Ed.), Adaptation Level Theory. New York: Academic Press.

Burchardt, T. and Vizard, P. (2011). "Operationalizing" the Capability Approach as a Basis for Equality and Human Rights Monitoring in Twenty-first-century Britain, *Journal of Human Development and Capabilities*, **12** (1), 91–119.

Burchell, B. (2011). A Temporal Comparison of the Effects of Unemployment and Job Insecurity on Well-being, *Sociological Research Online*, **16** (1), 9.

Clark, A. E. (2011). Worker Well-Being in Booms and Busts. In Gregg, P. and Wadsworth, J. (Eds.), *The labour market in winter: The state of working Britain* (pp. 128-143). Oxford: Oxford University Press.

Crabtree, S. (2010). Britons' Wellbeing Stable Through Economic Crisis. *Gallup*. [online] Available at: http://www.gallup.com/poll/144938/Britons-Wellbeing-Stable-Economic-Crisis.aspx. [Accessed 5th September 2013].

Di Tella, R., MacCulloch, R. J. and Oswald, A. J. (2001). Preferences over inflation and unemployment: Evidence from surveys of happiness, *The American Economic Review*, **91** (1), 335–341.

Diener, E., Lucas, R. E. and Scollon, C. N. (2006). Beyond the hedonic treadmill: revising the adaptation theory of well-being, *The American psychologist*, **61** (4), 305–14.

Diener, E., Suh, E. M., Lucas, R. E. and Smith, H. L. (1999). Subjective Well-Being: Three Decades of Progress, *Psychological Bulletin*, **125** (2), 276–302.

Dolan, P., Peasgood, T. and White, M. (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** (1), 94–122.

Gasper, D. (2010). Understanding the diversity of conceptions of well-being and quality of life, *The Journal of Socio-Economics*, **39** (3), 351–360.

Graetz, B. (1991). Psychiatric Epidemiology Multidimensional properties of the General Health Questionnaire, *Social Psychiatry and Psychiatric Epidemiology*, **26**, 132–138.

Gush, K., Scott, J. and Laurie, H. (2013). Households' responses to spousal job loss: "all change" or "carry on as usual"? *Understanding Society Working Paper Series*, 2013-04.

Huppert, F. A. and Whittington, J. E. (2003). Evidence for the independence of positive and negative well-being: implications for quality of life assessment, *British journal of health psychology*, **8** (1), 107–22.

Jivraj, S., Nazroo, J., Vanhoutte, B. and Chandola, T. (2014). Aging and Subjective Well-Being in Later Life. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, 1–12.

Mandemakers, J. J. and Monden, C. W. (2013). Does the effect of job loss on psychological distress differ by educational level? *Work, Employment & Society*, **27** (1), 73–93.

McDonald-Gibson, C. (2013). Exclusive: Red Cross launches emergency food aid plan for UK's hungry. The Independent. [online] Available at: http://www.independent.co.uk/news/uk/home-news/exclusive-red-cross-launches-emergency-food-aid-plan-for-uks-hungry-8872496.html [Accessed 11.10.13].

McGillivray, M. (2007). *Human well-being: Concept and measurement*. Basingstoke: Palgrave Macmillan.

Meegan, R., Kennett, P., Jones, G. and Croft, J. (2014). Global economic crisis, austerity and neoliberal urban governance in England. *Cambridge Journal of Regions, Economy and Society*, **7** (1), 137–153.

Muthén, L. K. and Muthén, B. (2010). Growth Modeling With Latent Variables. Using Mplus: Introductory and Intermediate Growth Models. *Mplus Short Course Topic 3.* [pdf] Available online at http://www.statmodel.com/course_materials.shtml. [Accessed 2nd December 2013].

Muthén, L.K. and Muthén, B. (2012). *Mplus User's Guide*. Seventh Edition. Los Angeles, CA: Muthén & Muthén.

Myers, M. (2012). Economic Review, April 2012. *Office for National Statistics*. [pdf] Available online at http://www.ons.gov.uk/ons/dcp171766_263951.pdf. [Accessed 20th October 2013]

ONS (Office for National Statistics) (2013). *Personal Well-being in the UK, 2012/13*. [pdf] Available at: http://www.ons.gov.uk/ons/dcp171778_319478.pdf. [Accessed 7th October 2013].

Plagnol, A. C. and Scott, J. (2010). What Matters for Well-Being: Individual Perceptions of Quality of Life Before and After Important Life Events. *Applied Research in Quality of Life*, **6** (2), 115–137.

Rajabi, G. and Sheykhshabani, S. H. (2009). Factor Structure of the 12-Item General Health Questionnaire, *Journal of Education & Psychology*, **3** (2), 81–94.

Self, A., Thomas, J. and Randall, C. (2012). Measuring National Well-being: Life in the UK, 2012. Office for National Statistics. [pdf] Available at: http://www.ons.gov.uk/ons/rel/wellbeing/measuring-national-well-being/first-annual-report-on-measuring-national-well-being/art-measuring-national-well-being-annual-report.html. [Accessed 1st October 2013].

Sen, A. (1987). The Standard of Living. In Hawthorn, G. (Ed.), *The Standard of Living* (pp. 1–38). Cambridge: Cambridge University Press.

Spence, R., Roberts, A., Ariti, C. and Bardsley, M. (2014). Focus On: Antidepressant prescribing. Trends in the prescribing of antidepressants in primary care, *The Health Foundation and the Nuffield Trust.* [pdf] Available online at

http://www.nuffieldtrust.org.uk/publications/focus-antidepressant-prescribing. [Accessed 7th June 2014].

Taylor, M. F., Brice, J., Buck, N. and Prentice-Lane, E. (2010). British Household Panel Survey User Manual Volume A: Introduction, Technical Report and Appendices. Colchester: University of Essex.

Vanhoutte, B. (2014). The Multidimensional Structure of Subjective Well-Being In Later Life. *Journal of Population Ageing*, **7** (1), 1–20.

Notes

1. A phrase used by Gasper (2010: 352) to distinguish more objective measures from 'subjective states'.

2. The 6 questions from the GHQ-12 used are: Here are some questions regarding the way you have been feeling over the last few weeks. For each question please tick the box next to the answer that best describes the way you have felt. Have you recently....

1) been able to concentrate on whatever you're doing?
2) felt that you were playing a useful part in things?
3) felt capable of making decisions about things?
4) been able to enjoy normal day-to-day activities?
5) been able to face up to problems?
6) been feeling reasonably happy, all things considered?

Response options:

i) Better/more so than usual
ii) Same as usual
iii) Less than usual
iv) Much less than usual....

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Appendix 1. Sample characteristics.

Time-constant variable	Wave 1 (start of pre-recession period)	Wave 4* (start of recession period)
	proportion	*proportion*
***Sex**:* male	.49	.49
Female	.51	.51
***Age band**:* ^16-24	.08	.09
25-34	.19	.20
35-49	.40	.43
50-59/64	.33	.28
***Labour market status**~:* Employed	.66	.65
Unemployed	.003	.002
Economically inactive	.05	.04
In and out of employment	.26	.27
Between unemployed and inactive	.03	.03
***Children in household**^^:* No children	.63	.59
Child(ren)	.37	.41
***Marital status**^^:* Couple	.71	.71
Single	.20	.20
Ex-couple	.08	.08
Widow/widower	.01	.01
***Educational attainment**^^:* High	.20	.21
Intermediate	.69	.69
No qualifications	.11	.10
***Tenure**^^:* Owned: outright	.21	.18
Owned: mortgage	.58	.61
Rent: social	.12	.12
Rent: private/other	.09	.09
***Disability**^^:* Not disabled	.95	.95
Considers self disabled	.05	.05
Income (monthly)	*mean*	*mean*
Average actual household income	£3,605	£3,696
Average logged household income (ALHI)	8.05	8.09
Unlogged equivalent of ALHI	£3,124	£3,252

**Note that a change in proportion across waves is acheived only by missing data and attrition as the variables are time-constant. Population aged 16-59/64 (F/M). BHPS UK sample, wave 2004 and 2007.*

^Status in 2007. ^^Status in 2007, or the closest preceding, then subsequent non-missing wave.~Groups 'Employed', 'Unemployed' and 'Economically inactive' refer to cases where the nominal labour market status was constant across all waves (allowing for missing observations). 'In and out of employment' describes cases who changed from employment to non-employed status, or vice versa, at least once. 'Between unemployed and inactive' describes cases who changed from unemployment to inactivity, or vice versa, at least once, and who were never employed in the study period.

Appendix 2. Covariate Coefficients for Model 1, Piecewise Latent Curve Model for *Life Satisfaction.*

	Intercept (η_{0i})		Pre-recession slope (η_{1i})		Recession slope (η_{2i})	
	Estimate	**(S.E.)**	**Estimate**	**(S.E.)**	**Estimate**	**(S.E.)**
Sex: Men†						
Women	0.040	(0.027)	-0.004	(0.010)	-0.001	(0.016)
Age band: 16-24†						
25-34	-0.225*	(0.065)	0.063*	(0.026)	-0.054	(0.035)
35-49	-0.400**	(0.071)	0.041	(0.028)	-0.040	(0.038)
50-59/64	-0.329**	(0.072)	0.065*	(0.027)	-0.060	(0.042)
Labour market and employment status: Employed†						
Unemployed	-0.254	(0.292)	-0.033	(0.093)	0.036	(0.230)
Economically inactive	-0.501**	(0.100)	0.017	(0.030)	-0.024	(0.052)
In and out of employment	-0.200**	(0.037)	0.022	(0.013)	-0.031	(0.019)
Between unemployed and inactive	-0.350*	(0.116)	-0.055	(0.040)	-0.092	(0.054)
Children in household: No children†						
Children	0.030	(0.038)	-0.021	(0.013)	-0.032	(0.017)
Marital status: Couple†						
Single	-0.310**	(0.052)	0.018	(0.019)	0.006	(0.030)
Ex-couple	-0.543**	(0.062)	0.065*	(0.025)	0.030	(0.036)
Widow/widower	-0.500**	(0.124)	-0.062	(0.060)	0.100	(0.132)
Educational attainment: High†						
Intermediate	-0.001	(0.035)	0.000	(0.013)	-0.029	(0.018)
No qualifications	0.057	(0.065)	-0.034	(0.026)	0.019	(0.034)
Tenure: Owned: outright†						
Owned: mortgage	-0.078*	(0.039)	-0.013	(0.015)	0.010	(0.024)
Rent: social	-0.245**	(0.067)	-0.020	(0.026)	0.021	(0.034)
Rent: private/other	-0.268**	(0.064)	0.020	(0.024)	-0.021	(0.036)
Disability: Not disabled†						
Considers self disabled	0.381	(0.094)	-0.050	(0.033)	0.026	(0.040)
Average household Income(centred) (log)	0.093*	(0.031)	0.015	(0.012)	0.043*	(0.019)

† *= reference category*

**p<0.05 **p<0.0005. N=10,254. Population aged 16-59/64 (F/M). BHPS UK sample, wave 2004 to waves 2008/9 and Understanding Society BHPS cohort wave 2010. Weighted estimates.*