

This article was downloaded by: [University College London]

On: 24 March 2015, At: 07:06

Publisher: Routledge

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



## Psychology & Health

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/gpsh20>

### Longitudinal associations between social connections and subjective wellbeing in the English Longitudinal Study of Ageing

Aparna Shankar<sup>a</sup>, Snorri Bjorn Rafnsson<sup>a</sup> & Andrew Steptoe<sup>a</sup>

<sup>a</sup> Department of Epidemiology and Public Health, University College London, London, UK

Accepted author version posted online: 28 Oct 2014. Published online: 04 Dec 2014.



CrossMark

[Click for updates](#)

To cite this article: Aparna Shankar, Snorri Bjorn Rafnsson & Andrew Steptoe (2014): Longitudinal associations between social connections and subjective wellbeing in the English Longitudinal Study of Ageing, *Psychology & Health*, DOI: [10.1080/08870446.2014.979823](https://doi.org/10.1080/08870446.2014.979823)

To link to this article: <http://dx.doi.org/10.1080/08870446.2014.979823>

PLEASE SCROLL DOWN FOR ARTICLE

Taylor & Francis makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications on our platform. Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Versions of published Taylor & Francis and Routledge Open articles and Taylor & Francis and Routledge Open Select articles posted to institutional or subject repositories or any other third-party website are without warranty from Taylor & Francis of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. Any opinions and views expressed in this article are the opinions and views of the authors, and are not the views of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor & Francis shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Terms & Conditions of access and use can be found at <http://www.tandfonline.com/page/terms-and-conditions>

It is essential that you check the license status of any given Open and Open Select article to confirm conditions of access and use.

## Longitudinal associations between social connections and subjective wellbeing in the English Longitudinal Study of Ageing

Aparna Shankar\*, Snorri Bjorn Rafnsson and Andrew Steptoe

*Department of Epidemiology and Public Health, University College London, London, UK*

*(Received 29 July 2013; accepted 20 October 2014)*

**Objective:** The role of social relationships in determining well-being may be particularly salient in ageing populations. There is only limited longitudinal research examining the relationship between different dimensions of social relationships and change in well-being over time. The present analysis explores the association between isolation, loneliness and two measures of subjective well-being over six years using data from the English Longitudinal Study of Ageing.

**Design:** Measures of social relationships were obtained at baseline and associations with well-being over the following six years were analysed using mixed models.

**Main outcome measures:** Hedonic and evaluative well-being assessed every two years over the six-year period.

**Results:** Levels of well-being showed a U-shaped relationship with time. At baseline, higher isolation and loneliness were associated with lower levels of hedonic and evaluative well-being. Individuals with high levels of isolation and loneliness initially showed a smaller decrease in evaluative well-being. The subsequent rise in well-being was, however, also diminished in this group. In contrast, loneliness was not associated with rate of change in hedonic well-being, while high levels of isolation were associated with a sustained decrease in hedonic well-being.

**Conclusion:** Social isolation and loneliness show different associations with changes in evaluative and hedonic well-being over time.

**Keywords:** social isolation; loneliness; subjective well-being; older adults; ELSA

### Introduction

Psychologists have long since been interested in understanding subjective well-being. Following the publication of the Stiglitz Commission report, which recommended complementing traditional drivers of policy-making such as GDP with indicators of national well-being; this has also gained attention from other disciplines and from policy-makers (Stiglitz, Sen, & Fitoussi, 2009). This has led to increased efforts in the UK and worldwide in developing appropriate measures of well-being and in gaining an increased understanding of determinants of well-being. The world is also experiencing a major demographic shift, with an increase in the number of older adults. Over the next

---

\*Corresponding author. Email: [aparna.shankar@ucl.ac.uk](mailto:aparna.shankar@ucl.ac.uk)

20 years, England is expected to have a 39% increase in the population aged 65–84 years and a 106% increase in those aged 85 years and over (The King's Fund, 2013). Hence, understanding factors that affect the health and well-being of older adults is particularly important.

Well-being is a complex and multidimensional construct. Research in the area indicates three broad dimensions, including *evaluative or cognitive well-being* which refers to global evaluations of satisfaction with life in general or specific areas of one's life, *hedonic or affective well-being* which captures mood or feeling within a specific time period and *eudaimonic well-being* which relates to satisfaction of basic psychological needs and self-determination (Dolan, Layard, & Metcalfe, 2011). While most studies focus on only a single aspect of well-being, it is clear that a consideration of these multiple dimensions is essential to gain a complete picture of an individual's state of well-being. Further, studies show that these dimensions may be associated with different predictors. A meta-analysis by Luhmann and colleagues showed that life events such as marriage and divorce have a greater effect on evaluative than on hedonic well-being, while the pattern of effects for events such as childbirth and employment differ for both forms of well-being (Luhmann, Hofmann, Eid, & Lucas, 2012). Analyses of Gallup data from 132 countries show that positive and negative feelings were more strongly predicted by a consideration of whether participants' basic psychological needs were met or not, while life evaluations showed stronger associations with material wealth (Diener, Ng, Harter, & Arora, 2010).

Social relationships are found to be an important predictor of well-being across the lifecycle (Diener & Seligman, 2002; Diener & Oishi, 2006), but may be particularly salient for older adults (Bowling et al., 2003; Matheson, 2011). Social relationships include multiple dimensions such as the size of individuals' social networks, frequency of contact with people within the network, feelings of loneliness or engagement in social activities. Older adults are often at a greater risk of isolation and loneliness due to the many life changes that take place in later life, including retirement, bereavement and children and friends moving away. Hence, our analysis focuses on the association of these variables with well-being in older adults. Social isolation is an objective measure, incorporating aspects such as network size, diversity, frequency of contact with network members and participation in social activities. Loneliness, on the other hand, is a subjective assessment and relates to individuals' perceived levels of isolation and satisfaction with existing relationships (Cornwell & Waite, 2009; de Jong Gierveld & Havens, 2004).

Although interrelated, the association between these constructs is usually small to moderate (Cornwell & Waite, 2009) and this association may be further attenuated in old age. One reason is that older adults may be more prepared to cope with changes to their social networks as they age, and many of these events are viewed as normal parts of ageing. Hence, despite the changes to social network size or frequency of contact with certain members, they may not feel lonely (Cornell & Waite, 2009). While most research suggests that loneliness and social isolation are detrimental to well-being (Dolan, Peasgood, & White, 2008), the association between social relationships and well-being may also be more complex in older ages. Most Western countries, including the UK and USA show a U-shaped association between age and different measures of well-being with high levels of well-being in early adult life falling in the 40s and 50s before rising into old age (Blanchflower & Oswald, 2008). However, studies of loneliness also

indicate a similar relationship with age, with teenagers and older adults reporting particularly high levels of loneliness, and low levels seen in middle age (Victor & Yang, 2011). On the other hand, analyses by the New Economics Foundation suggest that while satisfaction with life is generally low, satisfaction with personal relationships is high in older adults (Michaelson, Abdallah, Steur, Thompson, & Marks, 2008), while other work shows that older adults may have more positive ties when compared with younger groups (Fingerman & Charles, 2010). In an analysis, using the National Social Life, Health, and Aging Project (NSHAP) data, Cornwell and colleagues found that reported closeness to network members and the number of non-primary ties decreased, while certain aspects of social participation increased in older adults. The authors suggest that lower levels of closeness may be associated with decreased frequency of contact with network members (Cornwell, Laumann, & Schumm, 2008).

Socioemotional selectivity theory (SST) (Carstensen, Isaacowitz, & Charles, 1999) provides a framework for us to consider why isolation and loneliness may affect well-being in older age. According to SST, individuals' perception of time affects the emphasis they place on different goals. This differing emphasis, in turn, has implications for the nature of social interactions chosen to achieve these goals. In particular, older age is associated with a view of time as being limited and, thus, goals associated with emotion regulation are prioritised. This leads to a greater focus on close established relationships at the expense of network diversity. However, close relationships that fail to meet expectations and are unsatisfying may cause distress and be associated with lower levels of well-being. Thus, we might expect that dissatisfaction with relationships or loneliness, rather than social isolation, would be particularly detrimental to well-being. It is unclear, however, whether the effects are likely to be similar for hedonic well-being and evaluative well-being. Given the increasing emphasis on close ties, we may expect that dissatisfaction with these ties may cause individual to evaluate their lives less favourably over time. But, in line with Diener et al.'s (2010) findings, it is possible that older adults consider other factors when evaluating their life, or that feelings of loneliness are actually more situational with limited effect on global life satisfaction. Similarly, hedonic well-being like loneliness also has an affective dimension and hence, loneliness may be more important for hedonic well-being. Unsatisfying close ties and potential difficulties with forming new ties in older age may have a sustained effect on enjoyment of life. We aimed to examine this in a sample of older adults, using data from the English Longitudinal Study of Ageing (ELSA).

It must be noted that much of the research into social networks and subjective well-being is limited by its cross-sectional nature which offers us little understanding of how the well-being changes and how social relationships may affect well-being over time. To address this, we analysed data over a six-year period and used mixed models for analysis. The choice of mixed models also enabled us to deal with selective loss of data and different patterns of missingness, which is a common problem in many longitudinal studies. Such models offer a further advantage over traditional linear regression techniques in that they enable us to determine the trajectory of change in outcome over time (Singer & Willett, 2003). While we expected that both isolation and loneliness would be related to baseline levels of well-being, we hypothesised that loneliness rather than isolation would be associated with changes in well-being over time. We did not make any specific predictions regarding different effects for the evaluative and hedonic well-being.

## Methods

### Participants

Data were obtained from waves 2 to 5 of ELSA. ELSA is a nationally representative panel study of individuals aged 50 years and over. Fieldwork for the first wave of ELSA was carried out in 2002/2003 with follow-ups every two years. Further details regarding sampling and data collection are available elsewhere (Banks, Breeze, Lessof, & Nazroo, 2006; Marmot, Banks, Blundell, Lessof, & Nazroo, 2003). Wave 2 of ELSA was the first wave to include a measure of loneliness and hence is used as the baseline for these analyses. When compared with the wave 1 sample, those from wave 2 who were included in this analysis were younger (mean age 64.0 years vs. 67.9 years,  $p < .001$ ,  $d = .4$ ) and reported higher levels of hedonic well-being (mean score 13.5 vs. 13.1,  $p < .001$ ,  $d = .2$ ). They were also more likely to be in the top quintile of wealth (22.9% vs. 15.%,  $p < .001$ , Cramer's  $V = .2$ ) and less likely to suffer from a limiting long-standing illness (31.7% vs. 43.5%,  $p < .001$ , Cramer's  $V = .1$ ).

Follow-up data on measures of well-being were obtained at waves 3 (2006/2007), 4 (2008/2009) and 5 (2010/2011). The present analysis included 7724 participants at baseline. Four thousand and fifty-eight participants had provided data at every wave and 6484 participants had data at at least one other wave. In general, participants who drop out between ELSA waves have been shown to be less healthy, wealthy, socially connected and more lonely than those who remain in the study (Scholes, Taylor, Cheshire, Cox, & Lessof, 2008; Shankar, Hamer, McMunn, & Steptoe, 2013; Shankar, McMunn, Banks, & Steptoe, 2011) and report poorer well-being.

### Measures

An index of *social isolation* was computed, based on not living with a partner (scored as 1), not belonging to any organisations, clubs or religious groups (scored as 1), and having less than monthly contact with friends, family or children (each scored as 1). Scores on the index ranged from 0 to 5, with higher scores indicative of a greater degree of isolation (Shankar et al., 2011).

*Loneliness* was measured using the short form of the revised UCLA Loneliness scale (Hughes, Waite, Hawkey, & Cacioppo, 2004). The scale consists of three items. Responses to the items were summed and scores on this scale ranged from 3 to 9, with higher scores indicating greater loneliness. The scale was found to show strong positive correlations with the full UCLA loneliness scale and moderate correlations with negative emotions and perceived stress (Hughes et al., 2004). The scale showed acceptable internal reliability (Cronbach's  $\alpha = .82$ ).

Identical measures of well-being were obtained at baseline and at each of the follow-ups.

*Hedonic well-being* was measured using the four-item pleasure subscale of the CASP quality of life questionnaire (Hyde, Wiggins, Higgs, & Blane, 2003). An example of a typical item would be '*I enjoy the things I do*' with response options *Never*, *Not often*, *Sometimes* and *Often*. Responses were summed to form the enjoyment of life scale, which has been shown to predict all-cause mortality in older adults (Steptoe & Wardle, 2012). Scores ranged from 0 to 12, with higher scores indicating greater enjoyment of life (Cronbach's  $\alpha$  ranged from .65 to .70 across the four waves).

*Evaluative well-being* was measured using the Diener Life Satisfaction scale (Diener, Emmons, Larsen, & Griffin, 1985; Pavot & Diener, 1993). The scale consists of five items examining how satisfied the individual is with his/her life, with response options on a seven-point scale ranging from *Strongly agree* to *Strongly disagree*. An example of a typical item would be *'In most ways my life is close to my ideal'*. Responses were reversed and summed so scores ranged from 0 to 30, with higher scores indicating greater satisfaction with life (Cronbach's  $\alpha = .89$  at each wave).

### **Covariates**

Details on gender and age were obtained in the interview. Total (non-pension) wealth was used as a measure of socio-economic status, and was divided into quintiles for the purposes of analysis. Participants were also asked if they had any long-standing health condition and if it limited their activities. Based on their responses, participants were classified as having a limiting long-standing illness or not (McMunn, Hyde, Janevic, & Kumari, 2003). Previous research shows that these variables are closely associated with isolation and loneliness (Shankar et al., 2011) and are also key determinants of well-being in older adults (Dolan et al., 2008).

### **Statistical analysis**

Participants were included in the analytical sample for each wave as long as they had responded to at least one item on the life satisfaction or the enjoyment of life questionnaire at that wave. Item-wise missing values on covariates, predictors and measures of well-being, were imputed (for variables imputed: median percentage missing = 1.33; mean = 1.54; maximum = 3.12). Following this, mixed models (Singer & Willett, 2003) were used to analyse the effect of social isolation and loneliness at baseline on changes in enjoyment of life and life satisfaction over the six-year period. As scores on both isolation and loneliness were positively skewed, scores were categorised. Individuals were classified as reporting low (score of 0), intermediate (score of 1) and high levels of isolation (score of 2 and over), roughly corresponding to tertiles of isolation. Two groups were formed for loneliness, corresponding to those who reported never being lonely (score of 3) and those who reported being lonely some or all of the time (scores greater than 3). Wave, centred at the first wave, was used as a metric of time. Alternative functional forms were explored for the time metric and the best fitting model was chosen using Akaike's Information Criterion. Based on this, both a linear and a quadratic term were retained for time. The linear term for time corresponds to instantaneous rate of change, while the quadratic term corresponds to the acceleration or deceleration in growth over time (Holt, 2008). The final analysis reports a total of four models, with two each for evaluative well-being and hedonic well-being. The main predictor (isolation or loneliness) and its interactions with time were considered along with adjustment for all covariates. Models of isolation were adjusted for loneliness categories and vice versa. All analyses were adjusted for age, gender, limiting long-standing illness and wealth. Analyses were carried out using SAS v.9.3 and PASW 21.

## Results

Table 1 indicates characteristics of participants at baseline. Mean age of the participants was just over 66 years at baseline, and more than half the participants were women. Over a third reported having a limiting long-standing illness. Scores on the enjoyment of life and the life satisfaction scale were negatively skewed. Mean scores at follow-up (not presented here) indicated a small drop in scores on well-being at the first follow-up but then showed increases at subsequent follow-ups.

### *Changes in well-being over time*

In models for hedonic and evaluative well-being including only an intercept and linear and quadratic time terms, the linear term for time was significant and negative ( $B = -.25$ , 95% CI:  $-.29$  to  $-.21$  for hedonic well-being;  $B = -1.24$ , 95% CI:  $-1.39$  to  $-1.11$  for evaluative well-being) suggesting an instantaneous fall in scores for both measures of well-being. The quadratic term, however, was positive ( $B = .05$ , 95% CI:  $.04$ – $.07$  for hedonic well-being;  $B = .38$ , 95% CI:  $.33$ – $.42$  for evaluative well-being) suggesting that this drop is not maintained and an acceleration in well-being scores takes place over time. Figure 1(a) and (b) show the unadjusted changes in scores on well-being over time.

### *Social isolation and well-being*

In analyses adjusted only for age, gender and the time parameters, greater isolation was associated with lower levels of hedonic well-being (when compared with the low isolation group,  $B = -.36$ , 95% CI:  $-.44$  to  $-.27$  for the intermediate isolation group and  $B = -.97$ , 95% CI:  $-1.06$  to  $-.88$  for the high isolation group) and lower evaluative well-being (when compared with the low isolation group,  $B = -1.44$ , 95% CI:  $-1.74$  to  $-1.15$  for the intermediate isolation group and  $B = -3.36$ , 95% CI:  $-3.67$  to  $-3.06$  for the high isolation group). In fully adjusted models including the interaction with the time parameters, the interaction of social isolation with the linear time parameter was significant for both models (Table 2) such that individuals in the highest isolation

Table 1. Characteristics of study population.

Variables	Baseline sample ( $N = 7724$ )
Age – mean (SD)	66.4 (9.7)
Men (%)	44.8
Limiting long-standing illness (%)	34.6
Social isolation categories (%)	
Low	30.1
Intermediate	36.8
High	33.1
Loneliness categories (%)	
Low	53.3
High	46.7
Enjoyment of life – mean (SD)	10.0 (1.8)
Life satisfaction – mean (SD)	21.2 (6.1)



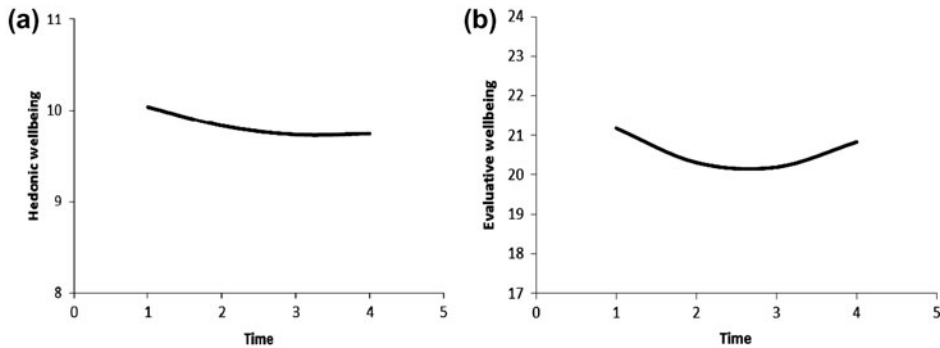


Figure 1. Changes in scores for hedonic well-being (a) and evaluative well-being (b) over time.<sup>a</sup>  
 Note: <sup>a</sup>Unadjusted values.

category showed a smaller instantaneous drop in scores on well-being when compared to those in the low isolation group. No significant difference was seen between the low and intermediate isolation groups. The interaction with the quadratic time parameter was also significant, although in the opposite direction, suggesting that the rate of change over time for the high isolation group was diminished compared with other groups.

Figure 2(a) and (b) illustrate the association of baseline social isolation with changes in scores on well-being. Individuals in the low isolation group showed the highest levels of well-being, while those in the high isolation group showed the lowest levels of well-being. All groups showed an initial drop in levels of well-being, although this drop was less pronounced among individuals with the highest levels of isolation. For individuals with low or medium isolation, scores on life satisfaction and enjoyment of life then increased. In contrast, the high isolation group showed a sustained decline on scores of enjoyment of life and only a small rise on scores of life satisfaction.

Table 2. Social isolation as a predictor of changes in well-being.<sup>a</sup>

	Enjoyment of life <i>B</i> (95% CI)	Life satisfaction <i>B</i> (95% CI)
Social isolation		
Low	Reference	Reference
Medium	-.14 (-.23 to -.05)	-.73 (-1.04 to -.43)
High	-.56 (-.67 to -.48)	-2.08(-2.39 to -1.77)
Social isolation × time		
Low	Reference	Reference
Medium	-.03 (-.14 to .07)	.03 (-.31 to .37)
High	.14 (.03-.25)	.46 (.11-.91)
Social isolation × time		
Low	Reference	Reference
Medium	.01 (-.03 to .04)	-.002 (-.11 to .11)
High	-.05 (-.08 to -.01)	-.12 (-.24 to -.01)

<sup>a</sup>Analyses were adjusted for time, time<sup>2</sup>, age, wave × age, gender, limiting long-standing illness, quintile of wealth and loneliness category.

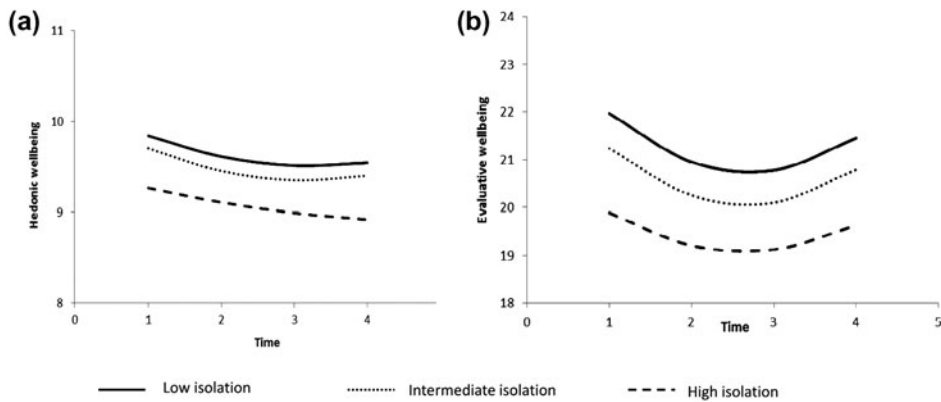


Figure 2. Scores on hedonic well-being (a) and evaluative well-being (b) over time by levels of social isolation.<sup>b</sup>

Note: <sup>b</sup>Models were adjusted for time, time<sup>2</sup>, age, gender, limiting long-standing illness, quintile of wealth and loneliness category.

### Loneliness and well-being

Individuals who reported being lonely some or all of the time reported poorer initial well-being (for those who reported being lonely some or all of the time  $B = -1.18$ , 95% CI:  $-1.25$  to  $-1.12$  for enjoyment of life and  $B = -4.43$ , 95% CI:  $-4.66$  to  $-4.20$  for evaluative well-being, when compared with those who were never lonely; analyses adjusted for age, gender and time parameters only). In models including the interaction with time and other covariates (see Table 3), the loneliness  $\times$  time interaction was non-significant in the model for hedonic well-being, as was the loneliness  $\times$  time<sup>2</sup> interaction, indicating that loneliness was not associated with a change in scores on hedonic well-being over time. However, in the model for evaluative well-being, the loneliness  $\times$  time interaction was significant, such that individuals who reported being lonely some or all of the time showed a smaller initial decrease in scores on life satisfaction. As with the model for social isolation, however, the loneliness  $\times$  time<sup>2</sup> interaction was sig-

Table 3. Loneliness as a predictor of changes in well-being.<sup>a</sup>

	Enjoyment of life $B$ (95% CI)	Life satisfaction $B$ (95% CI)
Loneliness		
Never lonely	Reference	Reference
Sometimes/always lonely	$-0.97$ ( $-1.04$ to $-.89$ )	$-4.12$ ( $-4.37$ to $-3.86$ )
Loneliness $\times$ time		
Never lonely	Reference	Reference
Sometimes/always lonely	$.08$ ( $-.02$ to $.17$ )	$.89$ ( $.60$ – $1.17$ )
Loneliness $\times$ time <sup>2</sup>		
Never lonely	Reference	Reference
Sometimes/always lonely	$-.01$ ( $-.04$ to $.02$ )	$-.17$ ( $-.26$ to $-.07$ )

<sup>a</sup>Analyses were adjusted for time, time<sup>2</sup>, age, gender, limiting long-standing illness, quintile of wealth and isolation category.

nificant and indicated that the rate of growth for the lonely group at later assessments was smaller.

As seen in Figure 3(b), individuals who reported never feeling lonely had higher levels of evaluative well-being at baseline. They initially showed a more rapid rate of decline but then showed a sharper increase when compared to those who reported feeling lonely some or all of the time. In contrast, the scores for hedonic well-being show a similar U-shaped curve for both groups. Individuals with high levels of loneliness show consistently lower levels of hedonic well-being.

Repeating the analysis with continuous values on isolation (log-transformed) and loneliness (reflected and inversed) led to substantively similar findings.

## Discussion

Levels of well-being in this sample of individuals aged 52 years and above were high. Over a six-year period, well-being showed an initial drop but then increased. This supports previous research showing increases in well-being after the age of 50 in most developed nations (Deaton, 2010).

Our analyses show that social isolation and loneliness were associated with poorer well-being at baseline in older adults. Both isolation and loneliness were associated with changes in the trajectory of evaluative well-being over time. Contrary to expectations, the initial decrease in evaluative well-being was actually lower among those with high levels of isolation or loneliness. The subsequent increase in well-being was, however, diminished in these groups. Individuals in the high isolation and high loneliness group already reported lower levels of evaluative well-being when compared with those who were less isolated or lonely. It must be noted, however, that the scores on well-being for this group were still towards the upper end of the scale and this is unlikely to be indicative of a floor effect. This may be explained by a number of factors. Firstly, it may indicate that older adults adapt to having poorer social relationships. While this

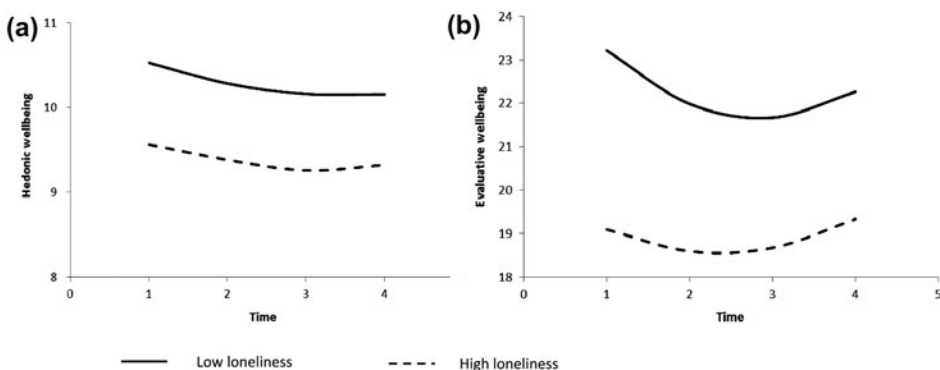


Figure 3. Scores on hedonic well-being (a) and evaluative well-being (b) over time by levels of loneliness.<sup>c</sup>

Note: <sup>c</sup>Models were adjusted for time, time<sup>2</sup>, age, gender, limiting long-standing illness, quintile of wealth and isolation category.

does affect overall levels of well-being relative to those with more social relationships, when evaluating their life these individuals may focus on other factors. Older adults have also been shown to focus on more positive information in attention and memory, and disregard negative information to promote greater well-being, i.e. the positivity effect (Reed & Carstensen, 2012). A further explanation is this may reflect the importance of other factors such as material resources in determining evaluative well-being (Diener et al., 2010). In contrast, those in the low isolation and low loneliness categories experienced the expected increases in well-being that are usually found with ageing. In line with SST, the general pattern of increase in well-being in older age may be attributed the nature of emotional self-regulation on older age (Carstensen, Isaacowitz, & Charles, 1999). For low isolation and low loneliness groups, close and satisfying ties as well as a larger network are likely to provide positive associations and memories. The importance attached to these may increase over time leading to sustained increases in well-being.

In accordance with our hypothesis, loneliness at baseline was associated with lower hedonic well-being. However, it showed no significant effect on the trajectory of hedonic well-being. Both high and low loneliness groups followed a similar trajectory of initial decrease in enjoyment of life followed by an increase, with the high loneliness group reporting consistently lower levels of well-being when compared with the low loneliness group. In contrast, increased isolation was associated with poorer hedonic well-being at baseline and with sustained decreases in hedonic well-being over the six-year period. Contact with a wider group of people, even those who may not be particularly close, may help individuals to gain knowledge, information and other practical skills which may promote increased well-being. A recent study showed that a greater number of daily interactions with others, even those who were not close network members was associated with higher levels well-being (Sandstrom & Dunn, 2014). Thus, even casual, daily interactions with others have the power to influence well-being. Further, it has been suggested that hedonic well-being acts as a marker of underlying health-related or dispositional processes (Stephoe & Wardle, 2012). Hedonic well-being has been found to be associated with poorer health, such that individuals who reported greater enjoyment of life (a measure of hedonic well-being) were less likely to develop limitations in activities of daily living and incident coronary heart disease (Stephoe, Demakakos, & de Oliveira, 2012). Sustained effects of social isolation on hedonic well-being may be associated with these health-related factors. Efforts to improve social integration among older adults may have substantial benefits for health and well-being.

Our results also offer some support to recent work examining the effects of structural and functional measures of social relationships on health and well-being. Isolation is a structural measure, while loneliness could be regarded as a functional measure. Huxhold and colleagues found that only structural measures of social relationships were associated with increases in positive affect over time, while both structural and functional measures (emotional support) were associated with changes in life satisfaction (Huxhold, Fiori, & Windsor, 2013). The authors also found that changes in emotional support over time were associated with decreases in negative affect but not positive affect. This suggests that functional measures may play a stronger role in alleviating unpleasant mood states rather than promoting positive ones. Our analyses did not examine a measure of negative affect and this represents an interesting avenue for future work.

### **Strengths and limitations**

A major strength of this analysis was the ability to examine changes in well-being over a period of six years using a large sample of older adults. A further strength of ELSA is the availability of multiple measures of well-being as well as of social connections and hence, we were able to compare changes in two measures of well-being and examine their relationships with two measures of social relationships. The use of mixed models also allowed us to deal with dropout and different patterns missingness in longitudinal data by using all the data provided by participants. However, we were unable to account for dropout between waves 1 and 2 of ELSA and we did not include participants who failed to complete the self-completion questionnaires at follow-up. Participants who dropped out following wave 1 were in poorer health and of a lower socio-economic status and our analysis revealed small to moderate levels of selectivity. The measure of hedonic well-being used in this analysis also showed low levels of internal reliability which may be cause for concern.

Naturally feelings of loneliness and levels of isolation are likely to change over time and in response to life events and as noted earlier, this may be particularly true for older adults. The present study examined measures of isolation and loneliness at a single point in relation to changes in well-being over time and further research could examine dynamic changes in well-being in response to changes in isolation and loneliness. Further, specific aspects of social networks may change in old age, with increases in activities such as religious participation or volunteering but decreases in network size (Cornwell et al., 2008). As with isolation and loneliness, these specific dimensions of social isolation may affect well-being differentially and future research could consider these aspects separately.

### **Conclusion**

Social isolation and loneliness show different associations with changes in evaluative and hedonic well-being over time. Interventions to improve the social networks of older adults are likely to be beneficial in improving hedonic well-being, while efforts to change evaluation of life are likely to require a greater consideration of other factors such as material resources.

### **Funding**

This study was supported by the Economic and Social Research Council Secondary Data Analysis Initiative [grant number ES/K003178/1]. The English Longitudinal Study of Ageing was developed by a team of researchers based at University College London, the Institute of Fiscal Studies and the National Centre for Social Research. Funding for the English Longitudinal Study of Ageing was provided by the National Institute on Aging [grant number 2R01AG7644-01A1], [grant number 2R01AG017644] and by a consortium of UK government departments coordinated by the Office for National Statistics. The data are lodged with the UK Data Archive.

### **References**

- Banks, J. A., Breeze, E., Lessof, C., & Nazroo, J. (2006). *Retirement, health and relationships of the older population in England: The 2004 English Longitudinal Study of Ageing (Wave 2)*. London: The Institute for Fiscal Studies.

- Blanchflower, D. G., & Oswald, A. (2008). Is well-being U-shaped over the life cycle? *Social Science and Medicine*, *66*, 1733–1749.
- Bowling, A., Gabriel, Z., Dykes, J., Dowding, L. M., Evans, O., Fleissig, A., ... Sutton, S. (2003). Let's ask them: A national survey of definitions of quality of life and enhancement among people aged 65 and over. *International Journal of Ageing and Human Development*, *56*, 269–306.
- Carstensen, L. L., Isaacowitz, D. M., & Charles, S. T. (1999). Taking time seriously: A theory of socioemotional selectivity. *American Psychologist*, *54*, 165–181.
- Cornwell, B., Laumann, E. O., & Schumm, L. P. (2008). The social connectedness of older adults: A national profile. *American Sociological Review*, *73*, 185–203.
- Cornwell, E., & Waite, L. (2009). Social disconnectedness, perceived isolation, and health among older adults. *Journal of Health and Social Behavior*, *50*, 31–48.
- de Jong Gierveld, J., & Havens, B. (2004). Cross-national comparisons of social isolation and loneliness: Introduction and overview. *Canadian Journal of Aging*, *23*, 109–113.
- Deaton, A. (2010). Income, ageing, health and well-being around the world: Evidence from the Gallup World Poll. In D. A. Wise (Ed.), *Research findings in the economics of ageing* (pp. 235–263). The University of Chicago Press.
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment*, *49*, 71–75.
- Diener, E., Ng, W., Harter, J., & Arora, R. (2010). Wealth and happiness across the world: Material prosperity predicts life evaluation, whereas psychosocial prosperity predicts positive feelings. *Journal of Personality and Social Psychology*, *99*, 56–61.
- Diener, E., & Oishi, S. (2006). The nonobvious social psychology of happiness. *Psychological Inquiry*, *16*, 162–167.
- Diener, E., & Seligman, M. E. P. (2002). Very happy people. *Psychological Science*, *13*, 80–83.
- Dolan, P., Layard, R., & Metcalfe, R. (2011). *Measuring subjective well-being for public policy* (Special Paper No. 23). London: Centre for Economic Performance, London School of Economics and Political Science.
- Dolan, P., Peasgood, T., & 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*, 94–122.
- Fingerman, K. L., & Charles, S. T. (2010). It takes two to Tango: Why older people have the best relationships. *Current Directions in Psychological Science*, *19*, 172–176.
- Holt, J. (2008). Modeling growth using multilevel and alternative approaches. In A. A. O'Connell & D. B. McCoach (Eds.), *Multilevel modeling of educational data* (pp. 111–159). Charlotte, NC: Information Age.
- Hughes, M. E., Waite, L. J., Hawkey, L. C., & Cacioppo, J. T. (2004). A short scale for measuring loneliness in large surveys: Results from two population-based studies. *Research on Aging*, *26*, 655–672.
- Huxhold, O., Fiori, K. L., & Windsor, T. D. (2013). The dynamic interplay of social network characteristics, subjective well-being, and health: The costs and benefits of socio-emotional selectivity. *Psychology and Aging*, *28*, 3–16.
- Hyde, M., Wiggins, R. D., Higgs, P., & Blane, D. B. (2003). A measure of quality of life in early old age: The theory, development and properties of a needs satisfaction model (CASP-19). *Aging & Mental Health*, *7*, 186–194.
- Luhmann, M., Hofmann, W., Eid, M., & Lucas, R. E. (2012). Subjective well-being and adaptation to life events: A meta-analysis. *Journal of Personality and Social Psychology*, *102*, 592–615.
- Marmot, M., Banks, J. A., Blundell, R., Lessof, C., & Nazroo, J. (2003). *Health, wealth and lifestyles of the older population in England: The 2002 English Longitudinal Study of Ageing* (pp. 207–230). London: The Institute for Fiscal Studies.

- Matheson, J. (2011). *Measuring what matters: National statistician's reflections on the national debate on measuring national well-being*. UK Office for National Statistics. Retrieved April 2, 2012, from <http://www.ons.gov.uk/ons/guide-method/user-guidance/well-being/publications/measuring-what-matters-national-statistician-s-reflections-on-the-national-debate-on-measuring-national-well-being.pdf>
- McMunn, A., Hyde, M., Janevic, M., & Kumari, M. (2003). Health. In M. Marmot, J. A. Banks, C. Lessof, & J. Nazroo (Eds.), *Health, wealth and lifestyles of the older population in England: The 2002 english longitudinal study of ageing* (pp. 207–230). London: The Institute for Fiscal Studies.
- Michaelson, J., Abdallah, S., Steur, N., Thompson, S., & Marks, N. (2008). *National accounts of well-being: Brining real wealth onto the balance sheet*. London: New Economics Foundation.
- Pavot, W., & Diener, E. (1993). Review of the satisfaction with life scale. *Psychological Assessment*, 5, 164–172.
- Reed, A. E., & Carstensen, L. L. (2012). The theory behind the age-related positivity effect. *Frontiers in Psychology*, 3, 339. doi:10.3389/fpsyg.2012.00339.
- Sandstrom, G. M., & Dunn, E. W. (2014). Social interactions and well-being: The surprising power of weak ties. *Personality and Social Psychology Bulletin*, 40, 910–922.
- Scholes, S., Taylor, R., Cheshire, H., Cox, K., & Lessof, C. (2008). *Retirement, health and relationships of the older population in England: The 2004 English Longitudinal Study of Ageing Technical Report*. London: National Centre for Social Research.
- Shankar, A., Hamer, M., McMunn, A., & Steptoe, A. (2013). Social isolation and loneliness: Relationships with cognitive function during 4 years of follow-up in the english longitudinal study of ageing. *Psychosomatic Medicine*, 75, 161–170.
- Shankar, A., McMunn, A., Banks, J., & Steptoe, A. (2011). Loneliness, social isolation and behavioral and biological health indicators and older adults. *Health Psychology*, 30, 377–385.
- Singer, J., & Willett, J. (2003). *Applied longitudinal data analysis*. Oxford: Oxford University Press.
- Steptoe, A., Demakakos, P., & de Oliveira, C. (2012). The psychological well-being, health and functioning of older people in England. In J. Banks, J. Nazroo, & A. Steptoe (Eds.), *The dynamics of ageing: Evidence from the English longitudinal study of ageing 2002–2010 (Wave 5)* (pp. 98–182). London: Institute for Fiscal Studies.
- Steptoe, A., & Wardle, J. (2012). Enjoying life and living longer. *Archives of Internal Medicine*, 172, 273–275.
- Stiglitz, J. E., Sen, A., & Fitoussi, J.-P. (2009). *Report by the commission on measurement of economic performance and social progress*.
- The King's Fund. (2013). *Future trends: Demography*. Retrieved July 9, 2013, from <http://www.kingsfund.org.uk/time-to-think-differently/trends/demography>
- Victor, C. R., & Yang, K. (2011). The prevalence of loneliness among adults: A case study of the United Kingdom. *The Journal of Psychology*, 146, 85–104.