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Revisiting The Paradox of Well-Being: The Importance of National Context

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**Abstract**

**Objectives:** Despite age related changes or declines in circumstances, health or income, many older people are able to maintain subjective well-being (SWB) in later life. This is known as the paradox of well-being. To date, much research has focused on both individual (e.g. age, health and income) and country-level (e.g. national wealth, inequality) differences in SWB. Yet little is known about how these differences combine to affect people's ability to maintain SWB in later life.

**Methods:** This research uses the 2008-2009 European Social Survey to test the multilevel hypothesis that economic circumstances, reflected by a country's Gross Domestic Product (GDP) affect the paradox of well-being, i.e. the relationship between age and SWB, even after accounting for other relevant psychological, individual, and country differences. Possible avenues by which GDP affects SWB are also explored.

**Results:** The multilevel analysis revealed that GDP disproportionally affects the SWB of older people relative to younger people, such that the paradox of well-being is only observed in countries with higher GDP. In countries with lower GDP, older people report significantly lower levels of SWB than younger people. The same pattern of results was obtained when the analyses were repeated on a subsample of respondents aged 60 years and over (?).

**Discussion:** The findings clarify the relationship between age and SWB by demonstrating that the paradox of well-being is conditional on the economic context. Implications for individual and country-level strategies for successful aging are discussed.

*Keywords*: Old age, Subjective well-being, GDP, paradox of well-being, Multilevel analysis

Revisiting The Paradox of Well-Being: The Importance of National Context

The economic, health, practical and social challenges posed by aging populations present pressing policy concerns for both developed and under-developed nations (Borsch-Supan, 2008; Lloyd-Sherlock, 2000). Many contend that a key policy objective should be to maintain, promote and improve well-being (Layard, 2010; Lepper & McAndrew, 2008; Stiglitz, Sen, & Fitoussi, 2008; Seaford, 2011). This is partly due to increasing recognition that people's health and longevity are affected substantially by their subjective well-being (SWB). Indeed, Diener and Chan's (2011) comprehensive review of evidence from economically developed nations concluded that differences in SWB can account for as much as 10 years difference in life expectancy. To date, a plethora of research shows that SWB is associated with both individual differences, such as age, income and health (for a review see Diener, Suh, Lucas & Smith, 1999), and differences between countries, such as economic development, defined by Gross Domestic Product (GDP; Diener, Diener & Diener, 1995). Yet, typically individual differences have been analyzed separately from country-level differences. This paper addresses this important void in the literature by testing whether the paradox of well-being (i.e. the absence of a relationship between age and SWB) varies according to GDP, and whether specific differences between countries, account for any influence of GDP on older people´s SWB in later life.

**Age differences in SWB**

Despite age related declines in circumstances, such as income or health, which are negatively related to SWB, research contends that SWB does not necessarily decrease with age across the life span (Diener & Suh, 1998), until impending death, approximately 3 to 5 years prior to end of life (Gestorf, Ram, Mayraz, Hidajat, Lindenberger & Wagner, 2010). This phenomenon that SWB does not necessarily decrease with age is known as the 'paradox of well-

being' (Hansen & Slagsvold, 2012; Krauss-Whitbourne & Sneed, 2002; Kunzmann, Little, & Smith, 2000; Mroczek & Kolarz, 1998). To date, no research has systematically investigated whether this paradox exists across different countries, or the extent to which differences between countries economic development might influence age differences in SWB.

SWB is not a unitary construct but comprises of both cognitive and affective components. The cognitive components involve people's judgments and evaluations about their life, which are usually measured as a global evaluation of life satisfaction (Diener, Suh, Lucas & Smith, 1999). One explanation for the paradox of well-being is that older people may accommodate or shift their expectations and goals in accordance to what is achievable in later life. Therefore, despite age related declines in income and physical or cognitive abilities, people are able to maintain life satisfaction because an accommodative shift means their aims and goals are in line with what is achievable (Brandstadter & Greve, 1994, Brandstadter, & Rothermund, 2002; Krauss Whitbourne & Sneed, 2002). This process of shifting expectations has also been widely applied to coping with illness, disease and disability (Kravetz & Roe, 2007, Brandstadter, & Rothermund, 2002). Related to this, downward social comparison appears to elevate SWB in face of objective loses (Mroczek & Kolarz, 1998, Wood, 1996, Diener & Fujita, 1997).

The affective component, or emotional well-being, is usually assessed by asking about the level of happiness (see Kunzmmann, Little & Smith, 2000, Diener et al., 1999). Older people's ability to maintain happiness in later life despite age-related declines (Mroczek & Kolarz, 1998) is thought to be due to their improved ability to regulate emotions (Carstensen, 1995; Lawton, Kleban, Rajagopal & Dean, 1992) and ability to develop a mature set of coping strategies and defense mechanisms that enable them to deal more effectively with emotional challenges (Krauss Whitbourne & Sneed, 2002). Related to this notion, socioemotional selectivity theory proposes

that with life experience older adults have found ways to successfully control and avoid potentially negative experiences such as ageism, by selecting social partners (e.g. family, friends) who provide positive emotional feedback and support (Carstensen, 1992; Carstensen, Isaacowitz & Charles, 1999).

Yet, a major limitation of previous research examining the paradox of well-being is that it has been conducted predominantly in wealthier countries (Krauss-Whitbourne & Sneed, 2002). A number of cross-national studies suggest that the relationship between age and SWB may be not as clear as suggested within the paradox of well-being paradigm. Research that has combined responses from the 43 nations that took part in the World Values Survey II does not appear to support the idea that happiness is maintained in later life, revealing that positive affect was lower in older respondents , while levels of life satisfaction did not differ across age groups (Diener & Suh, 1998). Moreover, Inglehart's (1990) analysis of the Eurobarometer (surveys from 1980 to 1986) and World Values Survey I, revealed that those aged 65 years and over only had the highest levels of life satisfaction and happiness across the life span once individual differences in objective circumstances in income, education and marital status were controlled for.

These differences between studies may reflect which indicators of SWB are measured, and which explanatory variables, if any, are included in the analysis. However, a more interesting possibility is that they also depend on the country or continents in which the data were collected. Since these studies reported only the overall (i.e., average) association between age and SWB across all countries, a possible variation in this association may have been obscured.

For instance, Lucas and Gohm (2000) showed that the correlation between age and life satisfaction was positive in some countries but negative in others. Blanchflower and Oswald's

(2008) curvilinear analysis of the relationship between age and SWB showed that the lowest level of happiness, among an American sample, and life satisfaction, among a European sample, occurred at different ages (at age XY in the American sample and age XY in the European sample). However, it is unclear whether this is due to underlying differences between countries, or differences between the aspects of SWB. Yet, the role of GDP in maintaining older people's SWB has not been empirically tested.

**Cross-Country Differences in SWB in Later Life**

Previous research has established that SWB is related to a country's wealth, specifically its GDP per capita, which reflects the total value of goods and services produced in a country in a given year (European Commission, 2011a). For example, happiness and averaged measures of SWB are higher in countries with a higher GDP per capita (Diener, et al., 1995; Schyns, 1998). Economic development can improve SWB by increasing a country's capacity to go beyond provision of basic needs such as, food, water, health and sanitation (Diener et al., 1995). GDP per capita has in itself been used a proxy for a population's well-being because it provides an indication of a country's capacity to deal with the material needs of its population (Giovannini, Hall, & d'Ercole, 2007). On average individuals within wealthier nations are likely to have better standards of living that allow a higher level of needs and goals to be achieved. Therefore, it follows that wealthier nations should be better equipped to deal with the needs of aging populations.

Indeed, a study by Deaton (2008) using the Gallup World Poll, revealed that the relationship between age and life satisfaction varied according to GDP. In most of the countries, life satisfaction declined linearly with age but the decline was smallest for countries with lowest GDP and largest in countries with mid-levels of GDP (mostly eastern European countries).

Moreover, there was a curvilinear U-shape in countries with the highest GDP, such as the US, Canada, UK, Australia and New Zealand. These findings support the notion that the wider economic context may buffer against some of the adverse effects of age on well-being, but the research has several limitations.

First, ordinary least squares regression was used for clustered data, i.e. individuals within countries. This method increases the risk of Type I errors, meaning that the analysis may overestimate the relationship between age and SWB.

*[The problem is that we do not know how the relationship between age and LS holds at the ind-level as within and between association are not necessarily the same (see ecological fallacy)]*

Second, the depiction of age differences was descriptive and the analysis did not adjust for (covary) other variables that have previously been shown to influence the relationship between age and SWB. Lastly, the study did not test possible explanations as to why GDP may have more or less impact on older people's SWB.

The present research addresses these limitations by applying a multi-level approach to explore cross-country differences in the paradox of well-being. Multilevel modeling can be applied to data that is 'nested' (e.g. individuals within countries) and allows for the simultaneous testing of differences between countries and differences between individuals within countries.

We expect age to be significantly related to SWB, but it is unclear whether the paradox of well-being will also be supported across different levels of GDP.  Previous research shows that GDP should have a positive influence on SWB but we hypothesize that GDP should also moderate the effect of age on SWB and test whether the paradox of well-being holds across poorer and wealthier countries. Countries with higher GDP should be better able to provide as a

whole for their entire population so that older adults may not be adversely affected in their

SWB. However, in countries with lower GDP the relative paucity of resources may be more

consequential for older people and therefore age seems more likely to be associated with lower

levels of SWB. In the following section, we will theorize why GDP may affect older people´s

SWB and which mechanisms are most to have an effect on the relationship between age and

SWB.

**Why would GDP affect older people's SWB?**

We propose that health care expenditure and societal attitudes towards older people are two

possible avenues that could account for competing effects of GDP on the relationship between

age and SWB.

**Health policies**. Government expenditure plans depend on GDP and estimates of

economic growth (e.g. Disney, 2000). Therefore, GDP influences policy strategies to deal with

challenges of aging populations, such as those related to health care provisions (European

Commission, 2011b). We might expect that countries with higher GDP per capita are better able

to provide a wider range of, and more substantial, support for older people, including better

health-care systems, better services and better infrastructure for older people (Gerdtham,

Sogaard, Andersson, & Jonsson, 1992; Lucas & Gohm, 2000). It seems reasonable then to expect

government investment in health care services has implications for SWB, particularly the SWB

of older people who are more likely to be using health care services.

**Societal attitudes.** According to modernization theory (Cowgill, 1986) higher GDP might

reduce SWB in later life.  Modernization theory posits that more modern and industrialized

societies, indicated by higher GDP, are likely to devalue older workers. This makes older people

more vulnerable to experiences of prejudice and discrimination, which can have a detrimental

impact on well-being (Garstka, Schmitt, Branscombe, & Hummert, 2004; Pascoe & Smart Richman, 2009). Therefore, the level of prejudice against older people within a society might be associated with GDP, impact upon well-being in later life and contribute to cross-country differences in the relationship between age and SWB.

*[I´m a bit confused now with our hypothesis. Do we hypothesize clearly that we expect lower levels of SWB in older adults in poorer compared to richer countries? If so, we explanation (or possible mechanism as you say which is basically a possible mediator) could indeed be differences in health policies. But the section on societal attitudes goes the other way around. So, here we would expect that it is in the richer countries that older people suffer from less SWB… It´s also not clear to me whether these sections are about possible other moderator variables (cross-level interaction effects) or main effects explaining mean differences in SWB across countries. I think it would be better to focus on cross-level effects (we aim to find other variables that also work as cross-level interactions…).*

**Additional Bases of Individual and Country Differences in SWB**

In addition we acknowledge that the literature on SWB is vast, at the individual level various studies have indicated that being married, employed, religious, having better health, higher income, more social support and higher educational attainment can each be positively related to aspects of well-being (Diener, 2000; Ellison, 1991; Diener et al., 1999; Kunzmann et al., 2000; Rentfrow et al., 2009; Warr, Butcher, Robertson, & Callinan, 2004). At the country-level, research suggest stronger political rights and civil liberties, greater individualism, less inequality, higher mean retirement age, and longer life expectancy should each be positively related to SWB (Diener, et al. 1995; Diener & Chan, 2011; Litwin & Shiovitz-Ezra, 2006; Kim & Moen, 2002). Religiosity at the country level may also help maintain SWB in later life although this depends

on the extent to which religion promotes conformity and individuality (Argue, Johnson, &

White, 1999; McFadden, 1995). For further information on how these variables related to SWB

see supplementary materials. These variables will be included in the analyses to see whether

controlling for relevant differences in individuals' circumstances and contextual differences

between countries impact upon the relationship between age, GDP and SWB **Method**

We used data from 53,773 respondents in 27 countries in the 2008/ 2009 European Social

Survey (ESS) (Norwegian Social Science Data Services, 2008). The ESS draws random

(probability) samples from the eligible residential populations aged 15 to 105 ($M_{age} = 47.53$ $SD =$

18.52) in 32 countries across the European region. Consistent with prior research investigating

the relationship between age and SWB (see Diener & Suh, 1998; Mroczek & Kolarz, 1998;

Deaton, 2008; Blanchflower & Oswald, 2008; Stone et al. 2010) we use data from the whole age

range available because the paradox of well-being involves a comparison between older and

younger respondents' SWB. However, because we are specifically interested in older people's

SWB we also provide analysis on a sub-sample aged 60 and over.

The ESS offers an ideal evidence base because the data span a diverse set of countries but

with rigorously validated cross-national measurement. The ESS data set currently includes 32

countries. However, data from four countries were excluded because the data were collected over

a year later than the others. Data from one country were excluded due to missing information on

the GINI index, the indicator for inequality. Two measures of SWB are included in the ESS,

these are standard measures of life satisfaction and happiness. The measure of life satisfaction

was; 'All things considered, how satisfied are you with your life as a whole nowadays?'

Responses to this item were recorded on an 11-point scale (from 0 to 10) with higher scores

indicating greater life satisfaction. The measure of happiness was; 'Taking all things together,

how happy would you say you are?' Responses were recorded on an 11-point scale (from 0 to 10) with higher scores indicating greater happiness. These components of SWB correlate at levels that are sufficient to infer they are parts of a higher order construct, namely SWB (see Diener 1994 for review). Indeed they were highly correlated, within countries, at the individual level, $r = .65$, $p < .001$. At the country-level average levels of life satisfaction and happiness were indistinguishable, $r = .97$, $p < .001$. Therefore, it was deemed appropriate to combine life satisfaction and happiness into a mean score of SWB, which was used as the dependent variable.[1] We then computed the intraclass correlation coefficient (ICC), which is the amount of variance associated with country differences. SWB had an ICC of .196, showing that 19.6% of variance was associated with differences between countries, thus there is sufficient variation to employ a multilevel approach.

Individual-level variables were gender (recoded as '0' = male, '1' = female), education level ('0' = not complete primary education to '6' = completed second stage of tertiary), marital status (recoded as '0' = no partner, '1' = marital status with partner), religiosity ('0' = not religious at all' to '10' = very religious), employment status ('0' reflects that respondents' main activity in the last seven days involved no paid employment, '1' their activities involved some paid employment), subjective poverty ('1' = living comfortably on present income to '4' = finding it very difficult on present income), subjective health ('1' = very good to '5' = very bad) and social contact ('1' = never meets socially with friends to '7' = meets socially with friends every day).

Country-level variables were GDP (higher numbers indicating a higher gross domestic product), inequality was indicated by GINI Index (higher numbers indicating more inequality of the income distribution within a country), life expectancy at birth, cultural individualism (higher

numbers reflect endorsement of autonomy values and lower numbers reflect more endorsement of embeddedness values), political rights and civil liberties (higher numbers representing less political and civil freedom), health care expenditure, religiosity (country's mean level of the individual's religiosity within that country), statutory retirement age for men and prejudice towards people over 70 (computed from the individual level variable, with '0' = feeling extremely negative about people over 70, to '10' = feeling extremely positive). See Table 1 for a summary of sample characteristics. For more information about individual and country-level variables see the supplementary materials, and Table S1 and S2 for full sample characteristics.

**Analytic Strategy**

The hypotheses were tested in three steps. The first analysis tested a model in which respondent's age, GDP and the hypothesized age by GDP interaction were used as predictors of SWB. The second step tested a model in which we included a set of individual-level variables that have been shown to significantly relate to either life satisfaction or happiness. The aim was to see whether controlling for relevant differences in individuals' circumstances impacted upon the relationship between age, GDP and SWB. Given that we are specifically interested in the paradox of well-being in later life we repeated these analyses on a subsample of respondents aged 60 and over in order to see whether the hypothesized age by GDP interaction arises within that subsample.

The third step unpacked effects of GDP by examining more specific country-level differences that theoretically relate to SWB, GDP or age. We considered two potential avenues through which GDP is likely affect older people's SWB and then tested the robustness of the hypothesized age by GDP interaction by testing whether alternative country-level variables interacted with age. This allowed us to understand whether other differences between countries

influenced the relationship between age and SWB. This was done in separate models to maintain maximum degrees of freedom at the country-level. Any variables with significant cross-level interactions with age were then tested in subsequent models alongside the age and GDP interaction in order to see whether the interactions account for unique variance. If the age by GDP interaction remained significant despite the inclusion of alternative predictors, we might cautiously conclude that GDP accounted for other cross-level interactions and that these collectively provide insight into the avenues through which GDP has an impact.

The models were analysed using HLM 6.0 (Raudenbush, Bryk, & Congdon, 2004), all variables were grand mean centred and the ESS design weight was applied to level one data.

## Results

### The Relationship between Age, GDP and SWB

The first model tested how SWB is affected by people's age (an individual-level variable) and the GDP per capita in their country (a country-level variable), as well as the cross-level interaction that indicates whether the relationship between age and SWB varies depending on GDP. This analysis revealed a significant negative effect of age and a significant positive effect of GDP, as expected. The hypothesized cross-level interaction was also significant, i.e. the effect of age on SWB varied depending on GDP, see Table 2, Model 1a. We are aware that $n = 28$ for the clustering level is lower than ideal for testing cross-level interactions in multilevel modeling. However, recent developments suggest that a Bayesian approach provides an appropriate multilevel test even with smaller cluster-level sample sizes (Asparouhov & Muthén, 2010; Browne & Draper, 2006). The Bayesian multilevel analysis (with Mplus 6.12 and Markov chain Monte Carlo estimations with non-informative priors) confirmed the cross-level interaction and

added to our confidence in the robustness of the finding, with Bayesian 95% credibility intervals indicating cross-level effects by GDP on SWB (95% CI = 0.10, 0.18).

An extended model re-tested these effects while controlling for the set of individual-level variables -- being married, employed, religious, health, subjective income, social contact and educational attainment. In these models the effect of age on SWB remained negative and significant even after controlling for all these differences among individuals, demonstrating a general decline in SWB with age. All but one of the individual-level variables was significantly related to SWB. The model revealed that having better subjective health, being female, married, religious, feeling comfortable with one's income, having more social contact, and not having worked within the last 7 days were independently related to higher levels of SWB.

Despite inclusion of these individual-level variables in the model, the main effect of GDP and the cross-level interaction between age and GDP remained significant (see Table 2, Model 2a). As expected, respondents in countries with higher GDP, such as Switzerland, Nordic countries and other northern European countries, such as Great Britain, Belgium and Germany, reported higher SWB. Importantly, however, SWB varied little with age in countries with higher GDP but decreased with age in countries with lower GDP, which include Eastern European countries. This supports the hypothesis that SWB in later life is more likely to be maintained in countries with higher GDP. Put another way, the gap in well-being between poorer and wealthier countries is larger among older than younger people (see Figure 1).

**Curvilinear Effect of Age**

Previous evidence has indicated that the relationship between age and SWB is curvilinear, with lower levels of SWB during middle-age than in youth or old age (Blanchflower & Oswald, 2008). We extended model 2a by adding the curvilinear (quadratic) effect of age on

SWB at level 1. The linear and curvilinear effects of age were significant ($B_{linear}$ = -.07, $p$ < .001; $B_{curvilinear}$ = .001, $p$ < .001). In this model we substituted the cross-level interaction between GDP and the linear effect of age with the cross-level interaction between GDP and the curvilinear effect of age. The cross-level interaction was significant (B = .001, $p$ <.001). In an additional model the cross-level interaction between GDP and linear effect of age was re-entered (in addition to the GDP by curvilinear effect of age). The GDP by linear effect of age interaction was marginally significant (B = .13, $p$ = .065), but the GDP by curvilinear age interaction was not ($p$ = .282). This suggests that although the data can fit a GDP by curvilinear age interaction, it is more parsimonious to fit a simple GDP by age linear interaction without adding the curvilinear term.

**Aged 60 and Over**

Our final analyses considered the effects of age and GDP among respondents aged 60 and over (n = 15,837, $M_{age}$ = 70.52, $SD$ = 7.66) given that, arguably, it is between pre and post retirement years that one might expect the largest effects of age on SWB. Consistent with this idea the ICC in this subsample revealed that there is more country-level variance in SWB (26.56%) than in the full age-range sample. We re-ran the first and second models on this subsample, see Table 2 for statistical results. The effect of age, GDP and the age by GDP interaction remained significant in both models. The interaction revealed a positive effect of age on SWB in countries with higher GDP, but SWB remained stable with age in countries with lower GDP. As before, the effect of GDP on SWB became greater with age, such that the relative disadvantage of being in a lower rather than higher GDP country increases with age. This is consistent with the idea that older people in wealthier countries are better able to maintain SWB. We also note that in contrast to the full age analysis, the relationship between age and

SWB became positive in model two, once adjusted for covariates, and the effects of gender and paid work were not significant.

**Further Analyses**

The final phase of analyses tests other cross-level interactions with age to determine what other country-level differences might impact on the SWB. In separate models, inequality (GINI), cultural individualism, political and civil freedom, life expectancy, government expenditure on health care, statutory retirement age, the level of age prejudice and religiosity were tested as level-two main effects and in a cross-level interaction with age. All level one predictors remained in the model.

The separate models revealed that individuals living in countries that value individualism, that have longer life expectancy, that spend more on health care, that have higher retirement age, or that are less religious have higher SWB. The relationships between SWB and inequality, level of prejudice and political rights and civil liberties were not significant

There were also significant cross-level interactions between age and inequality, cultural individualism, political and civil freedom, life expectancy, health care expenditure, retirement age and religiosity. These were similar in form to the interaction between age and GDP; the relationship between age and SWB maintains relatively stable in countries that are low in inequality, high in individualism, have longer life expectancy, have more political rights and civil liberties, greater health care expenditure, have a higher retirement age or are less religious. However, there is a more pronounced negative relationship between age and SWB in countries that are high in inequality or religiosity and countries low in individualism, life expectancy, political rights and civil liberties, health care expenditure, or that have a lower retirement age.

Put another way, the effect of each country-level variable increases with age, so that there is a larger difference in the SWB of older compared to younger respondents.

It is important to note these many of these cross-country differences also relate to GDP. Indeed, correlations among country-level indicators reveal that only GINI and prejudice levels are not significantly related to GDP (see Table 2, see Table 3 for correlations between individual-level variables). In follow up analyses we tested the robustness of these cross-level interactions to determine whether any were independent of, or could account for, cross-country differences in GDP. The analyses revealed that all of these county effects and cross-level interactions with age became non-significant when GDP, and the age by GDP interaction, were included into each separate model, see supplementary materials Table S3 results. Importantly the effect of GDP and the age by GDP interaction remained significant in all models, demonstrating the robustness of that interaction effect. An additional analysis revealed that the effects of GDP and the age by GDP interaction remained significant even when all level-two variables are entered simultaneously as covariates, although this reduced level two degrees of freedom to 16, see supplementary materials Table S4 for results.

## Discussion

The present research sheds new light on the relationship between age, GDP and SWB. The first and most basic model shows that SWB declines with age and that GDP is positively related to SWB. However, the relationship between age and SWB is qualified by a significant age by GDP interaction revealing that levels of SWB remain relatively stable across the life course in countries with higher GDP but they decline in countries with lower GDP. This is a new and robust finding that sheds important light on the nature of the paradox of well-being. The paradox of well-being in later life only exists in countries with higher GDP.

The second model shows that the effect of age, GDP and the age by GDP interaction are not attributable to other individual factors that are known to affect SWB, such as being married, feeling healthy and feeling more satisfied with income. In line with previous research, people who felt healthier, were married or in a partnership, more religious, felt comfortable living on their income and had more social contact reported higher levels of SWB. However, in contrast with previous research we found no evidence for an effect of education and, indeed, found that those classified as not working had higher SWB.  This latter finding may be due to the coding of the item used to measure employment status, which confounds those who are retired and those who have caring responsibilities with those who are unemployed.

The analyses on the subsample aged 60 give further insights into the nature of the paradox of well-being. In fact when individual circumstances are accounted for (Model 2b) SWB actually increases with age, confirming the paradox of well-being. In contrast to Model 2a, in which the relationship between age and SWB remains negative. This suggests that these circumstances have a greater negative impact on older people's SWB.   In addition, for this subsample being in paid employment within the last 7 days was not related to SWB. Thus, overall the analyses show that differences between countries' GDP may help to account for country differences in the relationship between age and SWB. Our finding suggests that SWB, and the paradox of well-being is maintained in countries with higher GDP, most notably northern European and Nordic countries, but not in countries with lower GDP, mostly eastern European countries.[2]

GDP potentially captures a variety of features that characterize a country as demonstrated by significant correlations with 6 out of 8 of the country-level variables (individualism, life expectancy, health care expenditure, average retirement age, religiosity and political rights and civil liberties). Surprisingly, levels of inequality, political rights or civil liberties, or prejudice

towards people over 70 were not related to SWB. However, we did find that country-level differences on several other variables were related to SWB. Individualism, life expectancy, health care expenditure and higher statutory retirement age were positively related to SWB, whereas religiosity (at the country-level) was negatively related to SWB. Thus, SWB in older age is more likely to be maintained in countries with less inequality, higher individualism, longer life expectancy, greater health care expenditure, higher statutory retirement age, lower religiosity and greater political rights and civil liberties. However, none of these country-level differences provide any additional explanatory power once GDP is accounted for. This may not be surprising given that the GDP and the cross-level interaction account for a very large percentage of the between country variance in SWB (81.9 per cent), which increased to 88.9 per cent among those aged 60 and over. For those aged 60 and over country-level differences and the effect of GDP may be more important given the increase in the ICC from 19.6 to 26.5 per cent. This suggests that the impact of GDP on SWB encompasses many more different elements than have been tested in the present study, and these may be more important in later life.

A number of mechanisms at the individual and psychological level have been proposed to explain how SWB can be maintained in later life, that unfortunately our analyses could not investigate. These include the ability to cope with negative life events, manage problems and psychologically adapt to changes in circumstance (Krauss-Whitbourne & Sneed, 2002). As circumstances change with age, so can standards of comparison, aspirations and expectations surrounding goal achievement, which form the basis of subjective evaluations of well-being. For instance, older people may lower their aspirations (Campbell, Converse & Rogers, 1976), adjust personal goals in relation to reduced resources and competencies (Brandstadter & Greve, 1994; Rapkin & Fisher, 1992) and use social comparison mechanisms to bolster subjective evaluations

(Heidrich & Ryff, 1993).  It seems then that there are two pathways to maintaining SWB in later life. The first would be to minimize age related declines in personal circumstances; the second would be to change expectations and comparisons that provide the subjective context for well-being. However, regardless of such individual strategies, the present study also suggests that living in a wealthy country can impact positively on evaluations of SWB.

The findings suggest that the larger effect of GDP on the SWB of older people may be a general effect, rather than being attributable to any single other characteristic that differs between countries, most notably health care expenditure and statutory retirement age. It is plausible that higher GDP sustains older people's well-being in a variety of ways through multiple characteristics and policies, and that the combination of these may differ in different countries. Even if some policies or variables have negative effects there can be others that compensate or have positive effects. However, maintaining sufficient avenues of support may depend on having sufficiently high GDP. The findings also imply that the well-being of aging populations in low GDP countries may be more difficult to maintain owing to the economic challenge of providing for their needs.

In sum, the results show that when a country's GDP is relatively lower, the negative effects on SWB are greater for older than younger people and the same holds true for the young-old compared to the old-old *(?) [integrate the findings]*. The evidence provides much clearer conclusions than previous research in two ways. First, the evidence shows that the 'paradox' of sustained well-being is not universal. In countries with higher GDP, SWB is sustained throughout later life, corroborating findings by Deaton (2008) on life satisfaction. However, well-being declines with age in countries with lower GDP, where the relationship between age and well-being has been less well studied. Second, extending Deaton's findings our multilevel

analysis shows that this finding cannot be readily attributed to individual circumstances, such as whether people have fewer educational qualifications, or lower income, or are employed. A further extension of Deaton (2008)  analyses also showed that other characteristics of countries impact on SWB, but that these are likely to be subsidiary to an overarching effect of GDP. For the first time, we also revealed evidence for potential avenues by which greater economic productivity may differently affect older people's SWB. This evidence disambiguates previous research because it accounts for both individual and country level sources of variability in SWB. It demonstrates the importance of GDP but also rules out the potential impact of a number of other plausible variables, such as levels of prejudice. Moreover, the age by GDP interaction remains when only considering those aged 60 and over, showing that the effect continues from earlier into later old age.

Much of the research demonstrating the paradox of well-being has been criticized for being conducted predominantly in wealthier countries (Krauss-Whitbourne & Sneed, 2002). Yet, both wealthy and less wealthy countries face challenges posed by aging populations. Accounting for country-level differences is important because the extent to which populations are aging varies considerably; the global population aged 60 and over is expected to reach nearly 2 billion by 2050, when 32 countries will have more than 10 million people over 60 (United Nations, 2010). The extent to which countries can accommodate demographic changes will also vary considerably (Lee, et al., 2010; United Nations, 2010) as will their existing political landscape and policy structure. Our analyses show that these factors have implications for the well-being of older people, and suggest important considerations for policy makers. For instance, the challenge of sustaining older people's well-being may be all the greater in the context of significant pressure to control government spending given the financial deficit many countries face at the

same time as projections of rising costs of sustaining an aging population (Lee et al., 2010).

**Limitations and Future Directions**

Because the present evidence is drawn from the European Social Survey, the results are of particular relevance to the European region. This means they may not generalise to other regions or continents. However, by using a multilevel modelling framework, we made the assumption that our clusters can be regarded as a random sample from a wider population allowing us theoretically and statistically to infer that the conclusions should also hold beyond the countries that were used in the analysis as long as they fall within the same range in terms of GDP and age (Raudenbush & Bryk, 2002).

The fact that many European countries share at least some common legal and economic frameworks makes them a meaningful set of countries for comparison of the effects of other factors. However, Europe does embrace considerable ethnic, linguistic and cultural diversity, providing a useful crucible for examining country level differences. The issue of age differences in well-being is especially important for Europe because the proportion of people of working age is declining. This increases the potential economic burden of aging populations on those of working age both as carers and as taxpayers. Indeed European level decisions that affect the GDP of particular countries will have a bearing on differences in the well-being of older people across this set of countries. Moreover, it is particularly valuable that the ESS has an extremely rigorous common measurement framework and instrument across all of the participating countries, ensuring that the data are of consistent and high quality. Although we would not extrapolate directly to other continents, many other countries are facing population aging, and therefore the present evidence is relevant to their future circumstances.

Although the effect of age remained significant once other individual differences had been controlled for, it should be considered in a broader context of variables that determine SWB. Nearly twenty per cent of variance in SWB was associated with differences between countries, leaving just over eighty per cent at the individual-level, within countries. In the present study variables included at level-one accounted for 19 per cent of the variance in SWB, implying that there remains a lot of unexplained variance at the individual-level. This is not surprising given that both momentary fluctuations and other individual differences can affect SWB. For example, personality and genetic factors are strong and consistent predictors of SWB (Bartels, & Boomsma, 2009; Diener at al. 1999; Weiss, et al., 2008). In the present research we were restricted by the scope of the ESS data and conceptual parsimony to only include variables that may influence the relationship of interest, that between age and SWB. Thus we examined primarily demographic and relatively sociological variables rather than highly specific personality measures or multi-item measures of psychological constructs that directly promote aspects of SWB (e.g, changing goals, expectations or aspirations as people age).  These remain interesting avenues for future research.

Life expectancy was included in the further analyses to ensure the age by GDP interaction was not an artefact of possible survey bias arising from country differences in mortality. However, survey samples such as the ESS may also bias our understanding of the relationship between age and SWB given increasing morbidity in later life. As life expectancy increases, so too does the prevalence of many diseases (e.g. dementia) that are likely to reduce the participation of the elderly population in survey-based research and might bias measured SWB upwards. Cross-country longitudinal research would be the only way to explore how GDP might influence how mortality and morbidity related changes in later life impact on SWB.

The present analyses also considered whether <mark>health care expenditure and societal attitudes</mark> to people over 70 were potential mechanisms through which GDP might differentially impact on older people's SWB. We found no evidence that prejudicial societal attitudes towards older people, an important focus of social research and policy (e.g. Abrams & Swift, 2012; Abrams, Vauclair & Swift, 2011),could explain the effects of GDP. In addition, although health care expenditure was positively related to SWB, and significantly interacted with age, the effects were not significant once the effect of GDP was accounted for. Therefore, health care expenditure did not make any unique contribution after GDP.  However, this does not mean that the potential mediating effect of health care expenditure should be ruled out by future research. The ESS data may have too few countries, thus potential power problems in detecting mediating effects.

There are other mechanisms through which GDP might disproportionately influence older people's SWB. Future research could consider the extent to which isolation, social or political engagement or exclusion could impact on older people's SWB.  There are also factors such as, trust in politics or political systems, political unrest or uncertainty or national crime statistics that might be worth considering. In addition, national levels of optimism might moderate effects of GDP on SWB. During recession people become more pessimistic as there are fewer opportunities in the employment markets and increasing competition for jobs. Older people may feel obliged to retire in order to make way for younger workers, or may be easy targets for organisations wishing to make cut backs. They may worry about affording retirement or helping family members financially who are affected by the recession, while their assets decrease in value.

**Conclusion**

This study provides a more complete picture than previously available of the relationship between age and SWB by combining both individual and country-level effects in one analysis. The analysis showed that GDP has a stronger impact on individuals' psychological well-being as they age. Given the now widely accepted impact of well-being on a host of other important outcomes such as health, productivity and longevity (Diener, 2000; Diener & Chan, 2011; Lyubomirsky, King, & Diener, 2005), it is of concern if the well-being of any section of a population is disproportionately affected by economic prosperity and decline. The combination of economic austerity, stagnation or depression and an aging population implies potentially greater harm to the well-being of large numbers of older people. This is important because, if not addressed, it could create a spiral of even greater national burdens of health and social care, which may itself further impede economic growth.

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Footnotes

[1] Analyses on separate SWB items are available from the corresponding author.

[2] An additional analysis showed the cross-level interaction between age and GDP remained after classifying countries as Eastern or Western Europe was entered as a covariate.

Table 1.

*Summary of Sample Characteristics*

| | N | Subjective Well-being | | Age | | GDP |
|---|---|---|---|---|---|---|
| | | Mean | *SD* | Mean | *SD* | |
| Belgium | 1760 | 7.46 | 1.60 | 46.46 | 18.73 | 0.98 |
| Bulgaria | 2230 | 4.75 | 2.42 | 51.84 | 17.66 | 0.79 |
| Switzerland | 1819 | 7.93 | 1.52 | 48.59 | 18.34 | 1.00 |
| Cyprus | 1215 | 7.24 | 1.54 | 44.81 | 17.79 | 0.92 |
| Czech Republic | 2018 | 6.71 | 1.85 | 47.10 | 17.34 | 0.92 |
| Germany | 2751 | 7.01 | 1.91 | 48.96 | 17.43 | 0.98 |
| Denmark | 1610 | 8.44 | 1.25 | 49.26 | 18.07 | 0.98 |
| Estonia | 1661 | 6.44 | 1.91 | 47.78 | 19.24 | 0.89 |
| Spain | 2576 | 7.44 | 1.58 | 46.83 | 19.16 | 0.96 |
| Finland | 2195 | 7.98 | 1.37 | 47.97 | 18.76 | 0.98 |
| France | 2073 | 6.68 | 1.92 | 48.65 | 18.72 | 0.97 |
| Great Britain | 2352 | 7.23 | 1.87 | 49.15 | 18.57 | 0.98 |
| Greece | 2072 | 6.33 | 1.90 | 45.04 | 16.75 | 0.94 |
| Croatia | 1484 | 6.61 | 2.04 | 47.31 | 18.26 | 0.85 |
| Hungary | 1544 | 5.63 | 2.26 | 47.78 | 19.07 | 0.87 |
| Israel | 2490 | 7.46 | 1.97 | 45.42 | 19.10 | 0.93 |
| Latvia | 1980 | 6.15 | 2.06 | 48.32 | 18.57 | 0.85 |
| Netherlands | 1778 | 7.67 | 1.34 | 49.31 | 17.78 | 0.99 |

Table 1.

*Cont.*

| | | Subjective Well-being | | Age | | GDP |
|---|---|---|---|---|---|---|
| | | Mean | *SD* | Mean | *SD* | |
| Norway | 1549 | 7.93 | 1.48 | 45.76 | 17.85 | 1.00 |
| Poland | 1619 | 7.00 | 2.00 | 44.64 | 18.96 | 0.85 |
| Portugal | 2367 | 6.02 | 1.95 | 52.75 | 19.96 | 0.91 |
| Romania | 2146 | 6.04 | 2.17 | 46.08 | 17.67 | 0.8 |
| Russian Federation | 2512 | 5.68 | 2.16 | 47.21 | 19.00 | 0.83 |
| Sweden | 1830 | 7.84 | 1.56 | 47.60 | 19.27 | 0.99 |
| Slovenia | 1286 | 7.08 | 1.85 | 46.56 | 18.91 | 0.93 |
| Slovakia | 1810 | 6.50 | 1.90 | 50.09 | 17.15 | 0.89 |
| Turkey | 2416 | 5.52 | 2.41 | 39.61 | 16.49 | 0.81 |
| Ukraine | 1845 | 4.68 | 2.27 | 48.84 | 18.68 | 0.71 |

Table 2.

*Multilevel Regression Models Predicting Subjective Well-Being*

|  | Model 1a | Model 2a | Sub-sample aged 60 and over | |
|---|---|---|---|---|
|  |  |  | Model 1b | Model 2b |
| Intercept | 6.80*** (0.08) | 6.75*** (0.07) | 6.55*** (0.09) | 6.48*** (0.07) |
| Individual-level effects |  |  |  |  |
| Age | -0.02*** (0.001) | -0.003** (0.001) | -0.01* (0.004) | 0.01** (0.004) |
| Subjective income (lower) |  | -0.38*** (0.04) |  | -0.45*** (0.04) |
| Marital status (partnership) |  | 0.37*** (0.04) |  | 0.47*** (0.04) |
| Education |  | 0.02 (0.01) |  | 0.02 (0.02) |
| Gender (female) |  | -0.11** (0.02) |  | -0.05 (0.04) |
| Paid work |  | -0.11*** (0.02) |  | 0.08 (0.06) |
| Religiosity |  | 0.05*** (0.01) |  | 0.07*** (0.01) |
| Subjective health (poorer) |  | -0.59*** (0.03) |  | -0.59*** (0.04) |
| Social contact |  | 0.16*** (0.01) |  | 0.11*** (0.01) |
| Country-level effects |  |  |  |  |
| GDP | 10.75*** (0.96) | 6.79*** (0.88) | 13.99*** (1.12) | 7.99*** (0.89) |
| Cross-level interaction |  |  |  |  |
| GDP x Age | 0.14*** (0.02) | 0.07*** (0.01) | 0.14* (0.05) | 0.10* (0.05) |
| Per cent of variance explained |  |  |  |  |
| Within countries | 3.94 | 19.50 | 0.67 | 19.00 |
| Between countries | 76.72 | 81.91 | 83.60 | 88.95 |

| Degrees of freedom | | | | |
|---|---|---|---|---|
| Within countries | 25 | 50263 | 25 | 14551 |
| Between countries | 25 | 24 | 25 | 24 |

*Note:* All entries are unstandardized regression coefficients. Bold coefficients are significant effects at $p < .05$ with standard errors in parentheses. All predictors are grand-mean centred. Data source: ESS 2009. Total N = 53773 respondents, 27 countries. Individual-level data are weighted by the ESS design weights. Significance levels indicated by *** $= p < .001$, ** $= p < .01$, * $= p < .05$.

Table 2.

*Correlations among Country-level Indicators*

| | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. |
|---|---|---|---|---|---|---|---|---|---|
| 1. Mean country level SWB | .873*** | -.264 | .677*** | .777*** | .762*** | .669*** | .138 | -.219 | -.460* |
| 2. GDP | | -.200 | .782*** | .873*** | .883*** | .593** | .053 | -.374* | -.515** |
| 3. GINI | | | -.191 | -.215 | -.327 | -.119 | -.145 | .354 | .452* |
| 4. Individualism | | | | .646*** | .784*** | .360 | -.016 | -.443* | -.366 |
| 5. Life expectancy [a] | | | | | .775*** | .651*** | -.043 | -.188 | -.705*** |
| 6. Health care expenditure | | | | | | .552** | -.089 | -.407* | .784*** |
| 7. Retirement age | | | | | | | .284 | .03 | -.481* |
| 8. Prejudice | | | | | | | | -.183 | -.052 |
| 9. Religiosity | | | | | | | | | .227 |
| 10. Political rights and civil liberties | | | | | | | | | |

*Note:* Significance levels indicated by *** = $p < .001$, ** = $p < .01$, * = $p < .05$.

[a] Life expectancy correlates with healthy life expectancy $r = .984$, $p < .001$.

Table 3.

*Correlations among Individual-level Indicators*

|  | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. |
|---|---|---|---|---|---|---|---|---|---|
| 1. SWB | -.135*** | -.393*** | .024*** | .071*** | .126*** | .003 | .146*** | -.391*** | .238*** |
| 2. Age | | .442*** | -.047*** | .180*** | -.299*** | .149*** | -.182*** | .028*** | -.234*** |
| 3. Subjective health (poorer) | | | -.090*** | .020*** | -.275*** | .094*** | -.204*** | .241*** | -.222*** |
| 4. Gender (female) | | | | .063*** | .137*** | -.173*** | .023*** | -.069*** | .045*** |
| 5. Marital status (partnership) | | | | | .108*** | .074*** | .029*** | -.069*** | -.147*** |
| 6. Paid work | | | | | | -.149*** | .345*** | -.193*** | .025*** |
| 7. Religiosity | | | | | | | -.178*** | .094*** | -.062*** |
| 8. Education | | | | | | | | -.222*** | .053*** |
| 9. Subjective income (lower) | | | | | | | | | -.136*** |
| 10. Social contact | | | | | | | | | |

*Note:* Significance levels indicated by *** = $p < .001$, ** = $p < .01$,* = $p < .05$.
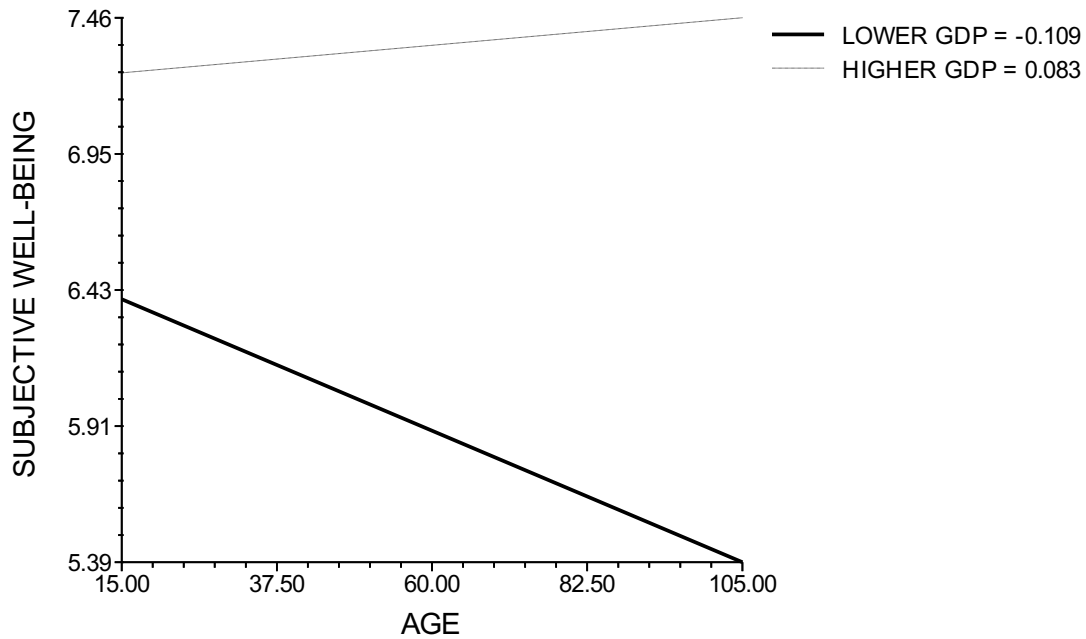
*Figure 1:* The relationship between respondents' age and subjective well-being as a function of

their country's GDP, after controlling for other individual differences (gender, marital status,

employment status, subjective health, subjective income, social contact and religiosity).

Note: GDP has been averaged at the upper and lower quartiles.
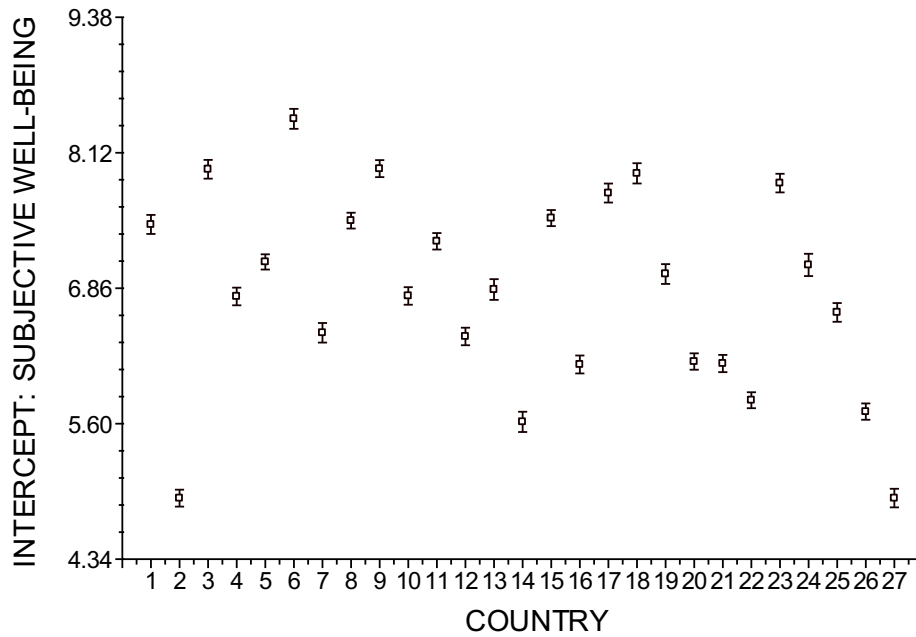
*Figure 2*. Unadjusted Confidence Intervals for Subjective Well-Being, valued at mean age

(47.53)

Note: Countries are, 1. Belgium, 2. Bulgaria, 3.Switzerland, 4. Czech Republic, 5. Germany, 6.

Denmark, 7. Estonia, 8. Spain, 9. Finland, 10. France, 11. Great Britian, 12. Greece, 13. Croatia,

14. Hungary, 15. Israel, 16. Latvia, 17. Netherlands, 18. Norway, 19. Poland, 20. Portugual,

21.Romania, 22. Russain Federation, 23. Sweden, 24. Slovenia, 25. Slovakia, 26. Turkey, 27.

Ukraine.