Aging, Death and Life Satisfaction: Evidence from the HILDA Survey

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Short description

This article uses longitudinal data from the HILDA Survey data to examine the relationship between life satisfaction and age, and especially how trends in life satisfaction evolve in old age.

Abstract

Does subjective well-being rise or fall with age, or are most people, and especially those in old age, sufficiently resilient that levels of subjective well-being are very stable over the life course? This paper uses longitudinal data from the HILDA Survey and finds that self-reported life satisfaction among a large sample of Australians does vary over time. Nevertheless, over much of adulthood – between age 25 and 65 – the range in this variation is very small. As people enter old age, however, life satisfaction falls quite sharply. Further, this fall does not appear to be entirely driven by mortality, with the decline beginning many years prior to death.

1. Introduction

Possibly the most impressive outcome of modern economic growth and technological progress has been the marked and steady improvement in life expectancy. According to data compiled by the Australian Bureau of Statistics (ABS 2014), males born in Australia during 2011 to 2013 could expect, on average, to live to 80 years of age, 12 more than for those born in the early 1960s. For females average life expectancy at birth is 84 years, 10 more than the 1960s level. Life expectancy has also increased at older ages. An Australian man aged 65 in the early 1960s could expect to live another 12.5 years; whereas today men of this age can expect to live another 19 to 20 years. But do longer lives necessarily mean better lives? Aging is often associated with a range of negative experiences, such as declining health and a contraction in social networks, and hence we might expect individual evaluations of life and personal well-being to decline in old age. In fact, the consensus view around the turn of the century was that measures of subjective well-being (SWB) remain relatively stable throughout adulthood (Diener et al. 1999). Such findings are often interpreted as consistent with theories that emphasise the self-regulating ability of individuals to cope with and adapt to changing life circumstances (e.g., Headey and Wearing 1992, Frederick and Loewenstein 1999, Cummins 2010).

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There are, however, at least two strands of research that challenge the notion that SWB is stable throughout adult life. The first comes largely from within economics, with a large number of studies, mostly using large cross-section data sets, reporting a U-shaped relationship between age and SWB once other influences on SWB are controlled for (see Blanchflower and Oswald 2008 and the references cited therein). In other words, on average SWB is actually higher among older individuals than among people in mid-life. And indeed it has become common practice for age to be specified as a quadratic when included in econometric studies seeking to explain interpersonal differences in measures of SWB.

More recent studies adopting more flexible specifications for age, however, typically find relationships that are less suggestive of a U-shape and more consistent with the presence of a hump that is centred around the traditional age of retirement (e.g., Wunder et al. 2013, Baetschmann 2014). Thus life satisfaction is found to rise once people reach their 50s and 60s before declining as people enter their later years. Less clear is how important this hump is; the variation in life satisfaction over most of the life span is still quite small.

Very differently, it has also been argued that findings from previous research, especially when based on cross-section data, reflect unobserved traits that are correlated with age, and do not identify a true aging effect. Differences in reported life satisfaction from people of different ages might, for example, simply reflect a cohort effect, where persons born in different eras are more or less likely to evaluate life favourably. Identifying an ageing effect instead requires data that are collected from the same people at multiple points in time, and then examining how life satisfaction differs across different points in the life cycle for these same people. This typically involves the estimation of panel data models where within-person changes are isolated through the incorporation of individual-specific fixed effects. Such models have been estimated by a number of recent studies employing household panel survey data (Gwodz and Sousa-Poza 2010, Frijters and Beaton 2012, Kassenboehmer and Haisken-DeNew 2012, Li 2016), all of which find the U-shape that is so prominent in cross-section data largely disappears. Further, in these models self-reported life satisfaction (the measure used in all of these studies) is found to be relatively stable over most of the life course, before declining quite markedly in older ages (beyond 70).¹

This finding that life satisfaction is declining in old age is also in line with findings from the second strand of research, which comes out of studies focused on the end of life. In this line of research it is not age that is critical, but time to death, with levels of SWB found to decline sharply in the last five or so years of life (e.g., Gerstorf et al. 2008, 2010).

In this paper we revisit the relationship between age and self-reported life satisfaction, but with a particular focus on the nature of this relationship in late life, using longitudinal data for Australia from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. We first examine the relationship between age and self-reported life satisfaction over the entire life span, before focussing more explicitly on the decline that occurs in late life, and whether that decline is more closely related to time to death than age.

2. Data

2.1 Sample

As just noted, the data used here come from the HILDA Survey, a longitudinal study that has been following members of a nationally representative sample of Australian households on an annual basis since 2001 (see Watson and Wooden 2012). More specifically, we use data from the first 14 waves spanning the period 2001 to 2014, which provides up to 200,311 observations from 28,794 individual respondents (aged 15 years or older).

2.2 Outcome Variable

The outcome variable used in this analysis is a self-reported measure of overall life satisfaction. It is constructed from responses to the question, “All things considered, how satisfied are you with your life”?, with participants instructed to provide an answer on a 0 to 10 scale, where 0 indicates “totally dissatisfied” and 10 “totally satisfied”. The question is administered by an interviewer, and is associated with very little item non-response – less than 0.1% – giving a total useable sample of 200,166 observations.

This variable has been used in a large number of research studies into subjective well-being in Australia, including a number of the previously cited studies on the relationship with age (Frijters and Beaton 2012, Li 2016, Cheng et al. forthcoming).

2.3 Identifying Deaths

Critical to the analysis in Section 4 on the influence of proximity to death is the identification of respondents who have died. This is a function of two processes. First, and most obviously, in the course of attempting to contact sample members at each survey wave, many of the persons who have died since they last responded will be identified (with attempts made to ascertain and record the date of those deaths). In total, 1357 sample members (including children and other non-responding sample members) have been identified during fieldwork as having died since commencement of the HILDA Survey panel in 2001. Second, and given the identification of deceased sample members during fieldwork will be both incomplete and imperfect (especially for persons that were living alone when last interviewed), in early 2014 the HILDA Survey sample was matched to the National Death Index, resulting in the identification of an additional 304 deceased persons (see Watson and Summerfield 2014). Once we restrict our sample to persons who have responded to at least one survey wave, we have a total of 1528 deceased persons.

3. Life Satisfaction and Age

We begin by reporting, in Figure 1, the raw relationship between life satisfaction scores and age (using the mean score for each year of age, as measured on the 30th June preceding interview each year) for the pooled cross-section sample. Given the small sample sizes in the oldest age groups, we have truncated the sample at an age of 95 years. As is immediately obvious, over much of life (between ages 15 and 75) a U-shaped relationship is apparent, with the mean scores declining from almost 8.5 among 15 year olds to around 7.6 for those in their mid-40s, and then gradually rising again with age and peaking among persons in their late 70s / early 80s at around 8.4. Thereafter, scores are much more variable, reflecting the increasingly smaller samples, but there do not appear to be any obvious signs that life satisfaction is falling with additional years of life. However, it must be recognised there is an obvious selection effect here – our respondents are all survivors who, at younger ages, might be expected to be relatively more healthy and satisfied with their lives than other members of their cohort who would die earlier.

Note also that these mean scores vary within a fairly narrow band around a sample-wide mean of 7.9. While this mean score is higher than estimates from other sources, the difference is not so great that it cannot be explained by differences in methods and sample composition. For example, the General Social Survey (GSS), a large cross-sectional survey conducted by the ABS that collected data on life satisfaction for the first time in its 2014 round, reported a mean score of 7.6 (ABS 2015), whereas the equivalent population weighted mean from the 2014 wave of the HILDA Survey was (again) 7.9. While these two surveys sample from very similar populations and ask an almost identically worded question about life satisfaction, the

response scales employed differently labelled anchor points. In the GSS a response of zero means “not at all satisfied”, which is very different to the “totally dissatisfied” anchor used in the HILDA Survey. We speculate that the former might be regarded by respondents as less extreme and so attract a relatively greater proportion of responses. This would explain the lower mean score in the GSS.

While not reported in detail here, we also checked whether there were any differences between men and women. The observed patterns among men and women were very similar, but with women, at least when aged between 20 and 60, reporting slightly higher satisfaction scores than men. While this might seem unexpected given evidence that the incidence of depression is higher among women than men (Piccinelli and Wilkinson 2000), this finding is consistent with previous cross-sectional research (Diener et al. 1999).

We next estimate a simple fixed-effects regression model where the only time-varying control variables are age dummies. With the fixed-effects method we are now constraining all estimates of the relationship between age and life satisfaction to be person-specific; we are looking at how life satisfaction varies over time for the same individuals, and thus eliminating any confounding effects from inter-personal differences. It thus comes much closer to isolating a true aging effect. Further, and unlike previous analyses of this issue, we do not impose a specific functional form on the age-satisfaction relationship. Rather, we include a set of single year age dummies, thus providing the most flexible relationship possible.

The predicted mean life satisfaction scores from this estimation are presented in Figure 2 (shown by the solid line). The inclusion of individual fixed-effects results in a very different pattern to the one that appears when observations are simply pooled and the data treated as a cross-section. We now find that among those over 70 years of age, life satisfaction declines markedly with age. Further, for younger people there is no sign of any obvious U-shape. Self-reported satisfaction levels are still highest among teenagers, but throughout most of adult life, and more specifically the period between age 25 and age 72, mean life satisfaction only varies within a narrow range (just 0.3 of a point).

We also tested whether the inclusion of other (time-varying) controls would make any substantive difference to this predicted relationship. Selection of these additional variables was based on the specification estimated by Wooden and Li (2014) and included, among other things, measures of household income, housing wealth, labour force and employment status, various personal characteristics, and subsequent attrition from the sample.² The predicted life satisfaction scores from this model are shown by the dashed line in Figure 2. As can be seen, inclusion of additional controls makes only a small difference, with slightly higher mean satisfaction scores at younger ages and slightly lower scores at older ages. In other words, the decline in life satisfaction with age becomes slightly steeper. However, the general pattern is unaffected – life satisfaction scores are reasonably stable through much of mid-life before declining quite sharply in old age. In the specification with additional controls this drop in old age is about 1.5 points, from around 7.9 when an individual is in their mid-60s to about 6.4 by their early 90s. As a guide to how significant this drop is, we can make comparisons with the effect of changes in other variables included in the model. For example, the loss in life satisfaction that is associated with moving from age 65 to 90 is about three times the loss of life satisfaction that is associated with the onset of a severe disability or long-term health condition.

4. Life Satisfaction and Proximity to Death

We next consider whether, and to what extent, this negative association between life satisfaction and age is associated with proximity to death. To investigate this we restrict our sample to the sub-sample of HILDA Survey participants who died after the panel commenced, and more specifically to those who died aged 50 years or older.

We again use the fixed-effects panel model to isolate within-person effects. Further, we also examine whether controlling for the effects of declining health, by including variables identifying the presence of long-term illness conditions and disabilities as well as two measures of subjective health, makes any marked difference. The disability variables are simple dummy variables identifying the presence of a mild, moderate or severe long-term health condition or disability, where severity is based on the extent to which the condition is work limiting (for more details of their construction, see Wooden and Li 2014). The subjective health variables are derived from responses to the Medical Outcomes Study Short Form (SF36) Health Survey, which is administered every year as part of the self-completion component of the HILDA Survey. The two variables included are derived from multi-item scales with scores normalised to range from 0 to 100, and designed to measure physical functioning and general health (see Ware et al. 1993).

Figure 3 shows that when the sample is restricted to those persons known to have died, there is an even stronger negative association between age and life satisfaction. Among those who die at relatively old ages (at age 70 or older), for example, the predicted decline in life satisfaction is spectacular – from a score of around 9.5 when someone is aged in their early to mid-60s to less than 7 by the time they reach their 90s. Few other events in life are associated with such a marked change in life satisfaction. Further, and somewhat surprisingly, the inclusion of the additional health measures made only a modest difference to the estimated patterns, at least for those dying at older ages (70 year or older).

The steeper declines suggested in Figure 3, relative to what is shown in Figure 2, suggests that the decline in life satisfaction in older age may be closely associated with the approach of death. Nevertheless, and despite our attempt to distinguish between different cohorts of persons who die at different ages, the evidence presented in Figure 3 is not a direct test of this hypothesis. Instead, and as suggested by Gerstorf et al. (2010), it might be preferable to examine how life satisfaction varies with time to death rather than with age. We thus repeated our fixed-effects estimation after replacing the age dummies with year to death dummies. We present, in Figure 4, the predicted scores from these models, both with and without the health controls. While it is true that life satisfaction, as expected, declines as death approaches, the expected kink in the relationship occurs quite close to death (one to two years prior) and the associated acceleration in the decline is relatively modest. Indeed, the kink is only prominent for those dying prematurely (that is aged 50 to 69); for those who died at an age over 70 it is not obvious that there is any marked acceleration in the decline in life satisfaction near end of life.

5. Discussion

We have shown that among older Australians (those older than 65 years), life satisfaction declines with age. Further, the magnitude of this decline is large, both in absolute terms and relative to other influences on well-being. This decline, however, only became apparent after isolating within-person changes, which we argue provide a much better guide to the true effect of ageing. We also attempted to control for other time-varying influences on life satisfaction, such as health and income, but this made little difference to our findings. This

suggests that there must be other things going on in old age that are adversely affecting subjective reports of well-being. Following other research, we suspected that this decline might be part of a terminal decline process that occurs as death draws near. Yet the evidence presented here suggests that the decline in satisfaction only accelerates marginally as death approaches.

The decline in reported life satisfaction with age thus appears to be much more closely associated with population ageing than it is with death per se. This, in turn, might imply that increasing longevity will not necessarily be associated with a marked improvement in quality of life among older Australians; more Australians will simply be spending more years in a relatively dissatisfied state. Such a conclusion has important and far reaching conclusions. Indeed, it implies that public resources should be diverted away from activity focused on extending life (as is the focus of much medical research) towards investing in activity intended to improve the quality of life.

Nevertheless, drawing such a strong conclusion from the analysis reported would be premature. Our study does not directly address the question of whether the relationship between life satisfaction and age is changing. We have clearly demonstrated a negative relationship between ageing and life satisfaction, but we have not attempted to identify any shift in this relationship over time. This, of course, is critical for drawing inferences about change in quality of life. But with only 14 years of survey data currently available from the HILDA Survey, attempting such an analysis we believe would be both premature and inconclusive. Nevertheless, as further waves of data are accumulated this is something that we (and / or other researchers) should investigate.

The most critical weakness of this study, however, is that it only documents the relationship between ageing and life satisfaction; it does not provide an explanation for what is observed. While we have tried to control for other influences on life satisfaction that would be of particular importance to the aged, such as health, the measures used are extremely crude. This reflects the fact that health states are complex and so not easily captured in any single measure or indicator, let alone measures derived from surveys. It thus remains a distinct possibility that declines in physical and mental functioning associated with the ageing process explain our findings.

But there are many other potential contributing factors. Perhaps most often mentioned is the shrinkage and loss of family and social networks that can accompany ageing. Increasing anxiety about longevity risk may also play a role. While impending death seems to play a minor role, the timing of death is very uncertain even for people with life-threatening illnesses. As one gets older one knows that death is more likely, but there is still a lot of uncertainty on an individual basis. Another possibility is a physiological change with age in the brain. And yet another possibility is the presence of a social culture that values youth above age.

Without having a clearer idea of why there is such a substantial decline in life satisfaction as people age, one does not have a firm basis for designing policy to prevent this decline because one does not know what policy levers to pull nor whether pulling them would be cost-effective in offsetting the decline.

Endnotes

1. In a spirited defence of the U-shape, Cheng et al. (forthcoming) report evidence of an upward sloping relationship between annual changes in life satisfaction and age in four longitudinal data sets (including the HILDA Survey data used here), at least when the

sample is truncated at age 70. This is consistent with the presence of a U-shape between the level of life satisfaction and age. However, they do not consider the possibility that the data are more consistent with the presence of other functional forms, and in particular a quadratic relationship between first differences in satisfaction and age. This would suggest the presence of a cubic relationship between age and satisfaction levels, which is much closer to the relationship that we observe in the HILDA Survey data.

2. The complete list of these time-varying is as follows: whether partnered (married or in a de facto) relationship; number of own children aged less than 15 years living with the respondent; number of persons aged 15 years or older living in the household; three variables identifying the presence of a long-term health condition and the extent to which it limits work; four variables identifying labour force status, and if employed, whether prefer to work fewer or more hours per week; the log of real equivalised household disposable income, accompanied by an indicator identifying non-positive incomes; whether a homeowner, and if so the real value of the net equity in that home; three variables identifying the degree of remoteness of the respondent's residential location; whether interviewed by telephone; whether others were present during the interview; and whether did not respond at the next survey wave.

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Figure 1 Mean Life Satisfaction by Age (pooled cross-section data)

**Figure 2 Predicted Mean Life Satisfaction by Age
(from fixed-effects regression models)**

Figure 3 Predicted Mean Life Satisfaction by Age
(from fixed-effects regression models; sample = persons who died aged 50+)

Figure 4 Predicted Mean Life Satisfaction by Years to Death
(from fixed-effects regression models; sample = persons who died aged 50+)

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