Linking Concurrent Self-Reports and Retrospective Proxy Reports About the Last Year of Life: A Prevailing Picture of Life Satisfaction Decline

Frank J. Infurna,1,2 Denis Gerstorf,1–3 Nilam Ram,1,3,4 Jürgen Schupp,1,5 Mirjam A. G. Sprangers,6 and Gert G. Wagner1,4,7

1German Socio-Economic Panel Study, German Institute for Economic Research (DIW Berlin), Germany.
2Institute of Psychology, Humboldt University Berlin, Germany.
3Department of Human Development and Family Studies, Pennsylvania State University, University Park.
4Center for Lifespan Psychology, Max Planck Institute for Human Development, Berlin, Germany.
5Institute for Sociology, Free University of Berlin, Germany.
6Department of Medical Psychology, University of Amsterdam, The Netherlands.
7Department of Economics, Berlin University of Technology, Germany.

Objective. We examined the extent to which retrospective proxy reports of well-being mirror participant self-reports at 12–24 months before death and how proxy reports of well-being change over the last year of life. We also explored the role of sociodemographic, cognitive, and health factors of both participants and proxies in moderating such associations.

Method. We used retrospective proxy ratings obtained in the German Socio-Economic Panel Study (N = 164; age at death = 19–99 years).

Results. Results revealed moderate agreement between self- and proxy reports (r = .42), but proxies, on average, overestimated participants’ life satisfaction by two thirds of a scale point on a 0–10 scale (or 0.4 SD). Discrepancies were particularly pronounced when proxies themselves reported low life satisfaction. Over the last year of life, participants were viewed to have experienced declines in life satisfaction (–0.54 SD). Declines were stronger for ill participants and proxies who reported low life satisfaction.

Discussion. Results qualify theoretical expectations and empirical results based on self-report data that are typically available 1 or 2 years before death. We discuss that retrospective proxy reports in panel surveys can be used as a hypothesis-generating tool to gather insights into late life.

Key Words: Exit interviews—German Socio-Economic Panel Study—Late-life satisfaction—Proxy reports—SOEP.

In recent years, a number of large-scale longitudinal studies have consistently shown that the end of life is characterized by prevailing declines in well-being (Berg, Hassing, Thorvadsson, & Johansson, 2011; Diehr, Williamson, Burke, & Psaty, 2002; Gerstorf et al., 2008a, b, 2010; Mroczek & Spiro, 2005; Palgi et al., 2010; Schilling, Wahl, & Wiegering, 2012). However, those data have primarily tracked participants only up to 2 or 1 year prior to death, leaving many questions about how well-being changes in the last year of life unanswered. Retrospective reports provided by proxies such as spouses or adult children about how the deceased person experienced his or her last months of life may be useful. Several national studies now include exit interviews with participants’ families and thereby offer researchers an opportunity to study changes that occurred during the last year of participants’ lives (Survey of Health, Ageing, and Retirement in Europe, SHARE: Börsch-Supan, Hank, Jürges, & Schröder [2008]; Health and Retirement Study, HRS: Silveira, Kim, & Langa [2010]; Panel Study of Income Dynamics, PSID: McDonough, Duncan, Williams, & House [1997]). But there is still more or less no evidence how good these proxy reports are. In this report, we use data from an exit interview questionnaire embedded in the German Socio-Economic Panel (SOEP) in 2009 and 2010 and examine the utility and limitations of using proxy-provided data to examine life satisfaction at the end of life. To do so, we first examine the extent to which retrospective ratings of life satisfaction provided by proxies are congruent with ratings of life satisfaction provided by participants at around 12–24 months before death and explore how congruence is moderated by the sociodemographic, cognitive, and health characteristics of both participants and proxies. In a second step, we investigate how life satisfaction changes in the last year of life in the retrospective perspective of the proxy and explore possible predictors of proxy-reported change.

Using Exit Interviews for Examining Late Life

Longitudinal surveys typically assess participants once a year (e.g., British Household Panel Survey and SOEP)
or once every 2 years (e.g., HRS and SHARE). The sampling frequency constrains our ability to use these large sample data to study changes occurring in the weeks and months surrounding major life events (Fauth, Gerstorf, Ram, & Malmberg, 2012; Infurna, Gerstorf, & Ram, in press; Lucas, 2007a). Even with 1-year time intervals, this may hinder researchers’ ability to assess participants who have to withdraw from a study due to serious illness, compromised functioning, and institutionalization or death (Lindenberger, Singer, & Baltes, 2002). For example, although changes preceding death can, at the present time, be examined in the SOEP through analysis of yearly reports of life satisfaction obtained from 4,878 participants who have died in the 26 years since study inception, less than 1% of these participants (n = 30) provided data within 12 months prior of their death. As a consequence of the data constraints, we know very little from longitudinal surveys about how life satisfaction progresses in the very last year and the very last months of life and what factors distinguish those who maintain well-being from those who do not. In contrast, research from clinical hospice and palliative settings involving participants and proxies are able to collect more in-depth data in the time during end-of-life periods than panel surveys and have shown that ratings of quality of life differ by type of death (Smith, Goy, Harvath, & Glymour, Avendaño, Haas, & Berkman, 2007; McDonough and end-of-life living situations (DeFries et al., 2009; Infurna et al., 1997). Exit interviews are typically provided by a spouse, adult child, or close relative who was likely in close contact with the participant prior to his/her death and knew of possible difficulties the deceased person may have been confronted with. For example, exit interview data have been used to examine the role advance directives and surrogate decision making before death played in whether individuals received care that was in line with their preferences (Silveira et al., 2010).

Our objective in this study is to explore the utility and challenges of using retrospective proxy-provided reports to study the progression and correlates of life satisfaction (change) in the last 12 months of life using data obtained from a subsample in a large-scale national survey. Proxy reports may afford examination of late-life change through provision of data at closely spaced intervals relatively near event occurrence. However, proxy reports of life satisfaction may also be inherently compromised by the nature of their content. Life satisfaction is a subjective “self”-evaluation that is, by definition, influenced by one’s current state of functioning (Sneeuw, Spranger, & Aaronson, 2002). As such, reports of others’ life satisfaction must be inferred from cues such as observable physical functioning, behavior, and verbal expression (Cummins, 2002). Proxy’s evaluations may or may not be congruent with individuals’ self-reports and may be influenced by the reporter’s own characteristics, as well as physical and cognitive limitations of patients that may inhibit one’s ability to make an accurate report (McPherson & Addington-Hall, 2003). Similarly, patients themselves who complete reports on life satisfaction and quality of life toward the end of life may also have difficulties evaluating themselves because of genuine physical and cognitive limitations (e.g., when people are delirious, demented, or heavily sedated).

**Congruence Between Proxy and Self-Reports of Life Satisfaction**

In the psychological literature, reports from close others (e.g., family members) are often used to index experiences and evaluations of a target person. In quantifying the agreement between self-reports and proxy reports, we follow previous research that has used effect size and correlation standards (e.g., Cohen’s d: .20 = small, .50 = medium, .80 = large; correlations: r = .10 = small, r = .30 = medium, r = .50 = large). Studies using population-based samples in various age ranges and reports from particular subpopulations alike have consistently indicated moderate agreement between self-reports and proxy reports. For example, in studies involving children, agreement between child reports and parent reports on various components of children’s health-related quality of life ranged from r = .44 to r = .61 (Theunissen et al., 1998). Similarly, Schneider and Schimmack (2009) reported from a meta-analysis that the correlation between self- and proxy ratings of life satisfaction for adults was r = .42 (99% confidence interval = 0.390.45). Sneeuw and colleagues (2002) reported that the correlation of quality of life reports between people with chronic diseases and their informants ranged from r = .42 to r = .78. In clinical settings, proxy reports provided by friends or family members are often used to help assess and treat people with personality disorders or cognitive impairments. Klonsky, Oltmanns, and Turkheimer (2002) found the median correlation between those proxy reports and self-reports of people with personality disorders to be r = .36 (Klonsky et al., 2002). Finally, Jorm (1996) observed that for people with cognitive impairment, correlations between proxy scales and cognitive screening tests ranged from r = .37 to r = .78.

Proxy reports in studies of adulthood and old age have examined individuals’ cognitive capabilities, health, personality, social support, and life satisfaction across...
a number of different settings, including caregiving and intergenerational exchanges (Infurna, Gerstorf, & Zarit, 2013; Kim, Zarit, Eggebeen, Birditt, & Fingerman, 2011; Mak, 2011; Piercy et al., in press). For example, Sneeuw and coworkers (1997, 1998) evaluated the usefulness of caregiver ratings of cancer patients’ quality of life and found relatively close agreement (e.g., $r = .56$) between patient and caregiver ratings with mean differences being of relatively small magnitude. Discrepancies were observed to be smallest for patients with a relatively poor or good quality of life, and largest disagreement was found at intermediate levels of quality of life (Sneeuw et al., 1998). Additionally, Hoerger and colleagues (2011) highlighted the potential utility of risk-detection strategies that rely on proxy reports in the personality domain (e.g., use family and friend proxy observations when making decisions about patient’s condition). In the context of this moderate resemblance, however, caregivers often draw a less favorable picture than the care recipients themselves. For example, caregivers often overreport their care recipients’ difficulties with performing activities of daily living and their depressive symptoms, and at the same time underestimate life satisfaction and health-related quality of life (Andresen et al., 2001; Horowitz et al., 2004; McAvay, Raue, Brown, & Bruce, 2005; Reamy, Kim, Zarit, & Whittatch, 2011). Under particular circumstances, agreement between proxy and self-reports might be higher for specific dimensions of functioning, such as observable behaviors of carrying out certain Activities of Daily Living as opposed to global evaluations of internal emotional states (Cummins, 2002; McPherson & Addington-Hall, 2003; Sneeuw et al., 2002; Yasuda et al., 2004).

A number of different characteristics including sociodemographic, cognitive, and health factors from both the participant and the proxy may moderate the degree of congruence between self-reports and proxy reports. To begin with, larger discrepancies were observed for participants who are older and those who are women (Sneeuw et al., 1998), probably because of age and gender differences in life satisfaction concepts by proxies (e.g., assuming that older people and women suffer from poorer health; Smith & Baltes, 1997), which proxies may draw upon as cues in making their life satisfaction reports. Cognitive difficulties of the participant may lead to larger discrepancies because participants and proxies may not communicate as efficiently as they may have done in the past (Reamy et al., 2011). Poor health may also serve as a risk factor for incongruence because health impairments compromise the quality of information available to the proxy (see Funder, 2003; Hoerger et al., 2011; Sneeuw et al., 1998). We also evaluate the extent to which characteristics of the proxy moderate congruence. Empirical evidence suggests that discrepancies in life satisfaction between self- and proxy-reports are less pronounced when the proxies are older and women (Kristjanson et al., 1998), probably due to differences attributable to experiences of how well-being is considered and cues that proxies utilize when making well-being assessments in others (Allen, Walker, Shergill, D’Ath, & Katona, 1998; McAvay et al., 2005). More specifically, younger raters may have less stable perceptions of their well-being, which would lower accuracy of life satisfaction estimates for others (Schneider & Schimmack, 2009). Proximity between participant and proxy has also been demonstrated to be of crucial importance. As compared with friends or professional health care providers, for example, agreements and validities are highest for close relatives (Andresen et al., 2001; Shardell, Alley, Miller, Hicks, & Magaziner, 2012), probably because of insights into the participants’ ideals and knowledge about actual life circumstances (Schneider & Schimmack, 2009). Finally, proxies who themselves report lower life satisfaction and poorer health may be less aware of their participants’ behavioral cues and knowledge about their life circumstances (Pruchno, Burant, & Peters, 1997; Reamy et al., 2011), in turn resulting in smaller congruence between life satisfaction reports.

**Proxy’s Retrospective View of Late-Life Satisfaction Change**

Moving one step forward, we examine how proxies retrospectively perceive their loved one’s life satisfaction to have changed over the last year of life. It is largely an open question what such change looks like. One candidate scenario is suggested by empirical evidence from panel surveys on self-report data (e.g., Gerstorf et al., 2010; Mroczek & Spiro, 2005). Specifically, proxies may report that their loved one experienced deteriorations in life satisfaction with approaching death. A contrasting stability scenario may emerge out of adaptive attempts of the bereaved person to cope with the death of the loved person. Specifically, it may be adaptive to recollect that the deceased person did not suffer too much and was able to maintain life satisfaction into the last phase of life (Stroebe & Schut, 1999).

Proxy perception of late-life satisfaction change may also be moderated by characteristics of either the participant or the proxy. Participants who were older and women may be more likely to have been perceived as experiencing stronger declines in life satisfaction, due to an increased likelihood of having experienced functional limitations and chronic illnesses in late life (Smith & Baltes, 1998). Far less is known regarding how cognitive difficulties and health factors of participants may be related to the perception of declines in late-life satisfaction. It is possible that cognitive difficulties and poorer health may be perceived to constrain and undermine emotion regulation capacities and thereby result in perceiving stronger declines in life satisfaction. Proxy characteristics can also be expected to moderate how proxies viewed participants’ last year of life. For example, proxies who were younger and men may be less sensitive to participants’ life circumstances (Forsell & Winblad, 1997), resulting in retrospectively reporting shallower declines in...
life satisfaction within the last year of life (McAvery et al., 2005). Similarly, proxies who shared a close relationship with the participant (e.g., spouse or adult child) may report stronger declines in life satisfaction because they know about their loved one’s life circumstances (Schneider & Schimmack, 2009). Proxies who report better health and life satisfaction may perceive less or no declines in their loved one’s life satisfaction because they have a more positive view of what has happened (Herrmann, 1995; Ross, 1989; Stroebe, Strobe, & Schut, 2001).

The Present Study

Research on the convergence of self-reports and proxy reports on indices of mental health and quality of life at the end of life provides solid evidence for the relative utility and validity of proxy responses (for reviews and meta-analyses, see McPherson & Addington-Hall, 2003; Schneider & Schimmack, 2009; Sneeuw et al., 2002). In the context of relatively minor mean-level differences, proxies typically underestimate levels of happiness and life satisfaction (Bassett et al., 1990). Adding to research examining the viability of proxy data, we use exit interview data from the SOEP and explore in our first research question the congruence between participant and proxy life satisfaction reports 12–24 months prior to death and explore the role of participant and proxy characteristics. The literature on congruence between participant and proxy reports of life satisfaction has largely focused on clinical settings; our study aims to provide insights on the utility of proxy reports of life satisfaction within the context of large-scale longitudinal surveys. Longitudinal surveys that incorporate exit interviews are useful in extending current knowledge by utilizing data on the individual collected previously to predict end-of-life experiences. Second, we do not only include sociodemographic characteristics of the proxy but also examine the extent to which his/her life satisfaction and health moderate congruence. Proxies who have sustained lower levels of life satisfaction and/or poorer physical health may be less able to provide accurate reports of their beloved one’s functioning.

Following research on the role of acquaintanceship and intimacy for proxy accuracy (Schneider et al., 2010), we hypothesize that there is relative congruence (quantified by moderate correlations [i.e., $r = .3$ to $r = .5$] and small mean-level differences [i.e., $d = .2$ to $d = .4$]) between proxy and participants’ life satisfaction reports. We expect that less congruence emerges for participants who experienced poor cognitive and physical health within the last year of life. In our second research question, we examine how proxies retrospectively perceive their loved one’s change in life satisfaction over the last year of life and the extent to which participant and proxy characteristics predict perceived rates of change. Consistent with empirical reports that document life satisfaction to deteriorate with impending death, we hypothesize that proxies report that their loved one experienced declines in life satisfaction within the last year of life and declines will be magnified for participants who had poorer health.

Method

We examined our research questions using data from the German Socio-Economic Panel Study (SOEP; Headey, Muffels, & Wagner, 2010). Comprehensive information about the design, participants, variables, and assessment procedures in the larger study is reported in the study by Wagner, Frick, and Schupp (2007). A brief overview is given subsequently.

Participants and Procedure

The SOEP is a nationally representative annual longitudinal study of private households (panel study) initiated in 1984 that covers residents of former West and East Germany, including immigrants and resident foreigners. Data were primarily collected via face-to-face interviews, with the exception of about 10% of individuals who had already participated several times. They provided data via self-administered questionnaires.

For the present study, we make use of data from an exit interview module that was included by some authors of this article in the 2009 and 2010 assessments. In lieu of the regular protocol, exit interviews covering a wide range of topics (e.g., cognitive and health status, cause of death, and living arrangement) were conducted with available proxies of participants who had died within the last year. Mortality status and year of death for deceased participants were obtained either (a) by interviewers at the yearly assessments (i.e., from household members or, in the case of one-person households, neighbors) or (b) from city registries and other authorities. Included in our analyses were data from 164 participants who (a) passed away between 2008 and 2010, (b) provided valid data on life satisfaction at the wave prior to death, and (c) who’s proxy had completed the exit interview questionnaire.

Table 1 provides descriptive statistics for our sample of participants and proxies. Participants were, on average, 71.68 years of age at death ($SD = 13.57$, range: 19–99), and 56 were women ($34\%$). Proxies were primarily surviving spouses ($n = 125; 76\%$) and adult children ($n = 31; 19\%$) but also parents and, in a few cases, neighbors and friends ($n = 8; 5\%$). Proxies, on average, were 65.89 years of age ($SD = 13.94$, range: 18–92) and 71% were women ($n = 117$).

Measures

Life satisfaction: Self-report.—Participants’ reported on their life satisfaction annually, answering the item “How satisfied are you with your life, all things considered?” (in German: ‘Wie zufrieden sind Sie gegenwärtig, alles in allem,’
Table 1. Means, Standard Deviations, and Intercorrelations Among the Constructs Included in the Present Study

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<td>4. Age at death</td>
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<td>6. % Cognitively impaired</td>
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<td>9. Proxy-rated Health (1–5)</td>
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<td>13. Life satisfaction (0–10)</td>
<td>5.86</td>
<td>2.28</td>
<td>0.24</td>
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<td>14. % Disabled</td>
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<td>15. Self-rated health (1–5)</td>
<td>2.90</td>
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Note. N = 164. Correlations above r = 1.15 are reliably different from zero at p < .05.

Life satisfaction: Proxy report of participant.—During the EXIT interview, proxies were asked two parallel items about the participants’ level of life satisfaction 12 and 3 months prior to death, “[Twelve/Three] months before death, how satisfied was [NAME] with [his/her] life, all things considered?” (in German: “Wie zufrieden war [NAME] [zwölf/drei] Monate, alles in allem, mit seinem/ihrem Leben?”), also answered on a scale ranging from 0 (totally unsatisfied) to 10 (totally satisfied). This item is considered a measure of cognitive-evaluative (as opposed to emotional) aspects of life satisfaction that assesses more global perceptions of general feelings of life and has been used widely in psychological research (for details, see Fujita & Diener, 2005; Gerstorf, Schimmack, Schupp, & Wagner, 2008).

Participant characteristics.—In our models, we also included participants’ age at death, gender (woman = 1), and information obtained from proxies about cause of death. Deaths were categorized into those that were likely accompanied by prolonged debilitating conditions (i.e., cardiovascular disease, cancer, severe infectious disease, gastrointestinal tract disease, and respiratory disease) versus those that were rather sudden (i.e., heart attack, epileptic stroke, and accident). Cause of death information was missing for 27 (14%) participants. Proxies also provided reports about the participant’s proxy-rated) health status (rated on a scale from 1 [bad] to 5 [very good]) at 3 months before death. Proxies were further asked whether their loved one had severe cognitive impairments (e.g., memory loss) or disability (i.e., participant was in need of care) at the time of death.

Proxy characteristics.—Characteristics of the proxies who completed the EXIT interview included age, gender, relationship status, life satisfaction, disability status, and self-rated health. Relationship status was dichotomized into whether the proxy was the child (N = 31) or spouse, parents, neighbors, or friends (N = 133). In follow-up analyses, we excluded the 10 proxies who were friends and neighbors. The pattern of results was not substantively different from those reported below.

Statistical Procedures

Congruence.—Our first research question focused on the extent to which there was congruence between
self- and proxy reports of life satisfaction 12 months prior to death. Figure 1 illustrates a schematic representation of our statistical procedure. In a first step, we modeled a latent growth curve model (McArdle & Nesselroade, 2003; Ram & Grimm, 2007; Singer & Willett, 2003) using participants’ annual life satisfaction observations provided between 5 and 1 year prior to death (e.g., years −5, −4, −3, −2, and −1) and recentered to determine each individual’s levels of life satisfaction exactly 1 year prior to death ($M = 4.60, SD = 0.90$; bottom of Figure 1). The model was specified as

$$y_{ti} = \pi_{0i} + \pi_{1i} \text{time-to-death}_{ti} + e_{ti} \quad (1)$$

where person $i$’s level of life satisfaction at time $t$, $y_{ti}$, is a function of an individual-specific intercept parameter that represents life satisfaction levels approximately at 12 months prior to death, $\beta_{0i}$, an individual-specific slope parameter, $\beta_{1i}$, that captures rates of linear change prior to death (years), and residual error, $e_{ti}$.

Following standard multilevel (or latent) growth modeling procedures (Ram & Grimm, 2007), individual-specific intercepts and slopes ($\beta$s from the Level 1 model given in Equation 1) were modeled as the Level 2 model where between-person differences were estimated (i.e., variance parameters) for level ($\beta_{0i}$) and linear change ($\beta_{1i}$), and are assumed to be normally distributed, correlated with each other, and uncorrelated with the residual errors, $e_{ti}$.

$$\pi_{0i} = \gamma_{00} + u_{0i},$$

$$\pi_{1i} = \gamma_{10} + u_{1i} \quad (2)$$

From the model, we outputted the random effect for intercept and used this for participants’ self-report 12-month assessment of life satisfaction. Taken together, we used all available individual life satisfaction observations between

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**Figure 1.** Schematic representation of our statistical procedures. In a first step, we estimated a latent growth curve model using participants’ life satisfaction observations across the last 5 years before death (Bottom). From the model, we outputted the random effect for intercept and used this for our self-report 12-month assessment of life satisfaction. In a second step, we used a Latent Difference Score model to examine congruence between each participant’s intercept or level of life satisfaction 12 months prior to death with proxy-reported life satisfaction 12 months prior to death (Middle). Lastly, we included participant and proxy characteristics into the model to examine whether they predicted between-person differences in congruence (Top). Means, intercepts, and variances were omitted for clarity. LS refers to Life Satisfaction observations and its numbers to the annual assessments from 5 years to 1 year prior to death.
5 years and 12 months prior to death to estimate a growth curve model, projected the intercept to approximately 12 months before death, and outputted the intercept to compare with proxy reports of participants’ life satisfaction at 12 months prior to death. Proceeding this way was necessary because participants provided their last life satisfaction report anywhere between 9 and 21 months prior to death. The growth models provided an estimate for life satisfaction that could be aligned with the reference frame used in the proxy reports (i.e., at 12 months prior to death).

In a second step, we used a Latent Difference Score (LDS; Ferrer & McArdle, 2010) model to examine congruence (difference) between each participant’s intercept or level of life satisfaction 12 months prior to death with proxy-reported life satisfaction 12 months prior to death (Middle part of Figure 1; Table 2). The model was specified as

\[
\text{Congruence}_i = \beta_0 + \beta_1 \text{Proxy 12-month report life satisfaction}_i + e_i \tag{3}
\]

where Congruence\(_i\) = Participant level 12 months prior to death \(−\) Proxy 12 month report life satisfaction\(_i\), \(\beta_0\) is the sample-level average of congruence between proxy and participant for a dyad with an average proxy score (i.e., proxy 12-month life satisfaction reports were centered at 6.48), \(\beta_1\) is the difference in congruence for each unit change in the proxy’s 12-month evaluation of life satisfaction, and \(e_i\) are residual errors. Positive scores for \(\beta_1\) indicate that the participant’s score was higher than the proxy’s, and negative scores for \(\beta_1\) indicate that proxy’s score was higher than the participant’s. In a final step, we included participant and proxy characteristics into the model to examine the extent to which they were associated with between-person differences in congruence (Top part of Figure 1). All predictors were grand mean centered (Models 2 and 3 in Table 2).

**Change in last year of life.**—Our second research question examined how proxies portrayed their loved one’s life satisfaction to change across the last year of life (see Table 3). To do so, we used an LDS model (similar set-up to research question one). The model was specified as

\[
\text{Change}_i = \beta_0 + \beta_1 \text{Proxy 12-month report life satisfaction}_i + e_i \tag{4}
\]

where \(\text{Change}_i = \text{Proxy 3-month report}_i − \text{Proxy 12-month report}_i\) (i.e., 9-month change), \(\beta_0\) is the sample-level average of life satisfaction change within the last year of life for a dyad with an average proxy score (i.e., proxy 12-month life satisfaction reports were centered at 6.48), \(\beta_1\) is the change in life satisfaction change for each unit change in the proxy’s 12-month evaluation of life satisfaction, and \(e_i\) are residual errors. In a second step, we included participant and proxy characteristics into the model to examine the extent to which they were associated with between-person differences in proxy-reported change. All predictors were grand mean centered (Models 2 and 3 in Table 3), where Change\(_i\) would be interpreted as proxy reported life satisfaction change for the prototypical “average” participant and proxy in the study.

### Table 2. Predicting Congruence Between Participant and Proxy Reports of Life Satisfaction 12 Months Prior to Death

<table>
<thead>
<tr>
<th>Variable</th>
<th>Parameter estimates (SE)</th>
<th>Std. (\beta)</th>
<th>Parameter estimates (SE)</th>
<th>Std. (\beta)</th>
<th>Parameter estimates (SE)</th>
<th>Std. (\beta)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept, (\beta_0)</td>
<td>-0.63* (0.11)</td>
<td></td>
<td>-0.63* (0.11)</td>
<td></td>
<td>-0.63* (0.10)</td>
<td></td>
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<tr>
<td><strong>Participant characteristics</strong></td>
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</tr>
<tr>
<td>Proxy-rated life satisfaction of participant, (\beta_i)</td>
<td>-0.71* (0.05)</td>
<td>-74</td>
<td>-0.71* (0.05)</td>
<td>-74</td>
<td>-0.77* (0.05)</td>
<td>-80</td>
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<tr>
<td>Age at death, (\beta_1)</td>
<td>0.01 (0.01)</td>
<td>.04</td>
<td>0.01 (0.01)</td>
<td>.06</td>
<td>0.68 (0.40)</td>
<td>.15</td>
</tr>
<tr>
<td>Women, (\beta_2)</td>
<td>0.75 (0.41)</td>
<td>.17</td>
<td></td>
<td></td>
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<td>Cognitively impaired, (\beta_3)</td>
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<td>Disabled, (\beta_4)</td>
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<td>Prolonged illness, (\beta_4)</td>
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<tr>
<td>Health status, (\beta_6)</td>
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<tr>
<td><strong>Proxy characteristics</strong></td>
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<tr>
<td>Age, (\beta_7)</td>
<td>-0.01 (0.02)</td>
<td>-0.07</td>
<td>-0.01 (0.02)</td>
<td>-0.05</td>
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<tr>
<td>Women, (\beta_8)</td>
<td>0.80 (0.42)</td>
<td>.17</td>
<td>0.67 (0.39)</td>
<td>.14</td>
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<td>Child, (\beta_9)</td>
<td>-0.75 (0.53)</td>
<td>-1.13</td>
<td>-1.04* (0.53)</td>
<td>-1.19</td>
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<tr>
<td>Life satisfaction of proxy, (\beta_{10})</td>
<td></td>
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<tr>
<td>Disability status, (\beta_{11})</td>
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<td>Self-rated health, (\beta_{12})</td>
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<td><strong>Random effects</strong></td>
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<tr>
<td>Residual variance, (\sigma^2)</td>
<td>2.04* (0.23)</td>
<td></td>
<td>1.97* (0.22)</td>
<td></td>
<td>1.69* (0.19)</td>
<td></td>
</tr>
<tr>
<td>(R^2)</td>
<td>.545</td>
<td>.561</td>
<td>.624</td>
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</table>

**Notes.** \(N = 164\). Std. \(\beta\) = Standardized betas. *\(p < .05\).
Results

Congruence Between Proxy and Self-Reports of Life Satisfaction

Table 1 provides intercorrelations for participants’ life satisfaction 12 months prior to death as taken from the growth curve model, retrospective proxy reports of participant’s life satisfaction at 12 and 3 months prior to death, and the correlates included in our study. Proxies, on average, reported higher life satisfaction than focal participants by −0.63 points, $d = −.33$, a low to moderate degree of incongruence. Additionally, proxy reports were more varied than participant’s own reports, $SD = 2.22$ than for participant reports, $SD = 1.58$ ($F = 1.41, p < .05$). Most important for our research question, the correlation between the proxy and estimated participant reports of life satisfaction 12 months prior to death was $r = .42$, a moderate degree of congruence.

Table 2 shows results from a series of LDS models quantifying the extent to which there was congruence between proxies and participants’ life satisfaction 12 months prior to death. At the zero-order level (Model 1), we observed that there was a discrepancy between proxy and participants’ reports ($β_0 = −0.63, p < .05$), suggesting that the prototypical proxy overreported their loved one’s life satisfaction approximately 12 months prior to death by some two thirds of a scale point on a 0–10 scale (or 0.4 $SD$ using the standard deviation of the model-implied self-report of life satisfaction at 12 months prior to death as the reference; see Table 1). After controlling for proxy-rated life satisfaction of participants, there were sizeable between-person differences in this discrepancy ($σ^2 = 2.04, p < .05$). In Models 2 and 3, we examined the extent to which and how these differences were related to proxy and participant characteristics. The results indicated that there was less congruence when the proxy was a child ($β_6 = −1.04, p < .05$) and was less satisfied with life ($β_{11} = 0.15, p < .05$). In a follow-up analysis, we did a split of proxies who over- versus under-estimated their loved one’s life satisfaction. Of the 164 proxies, 113 (69%) overestimated and 51 (31%) underestimated their beloved one’s life satisfaction 12 months prior to death. Using a logistic regression that included all of the predictors from our analysis for Model 3 in Table 2 and with overestimation being the outcome, we observed that women were less likely to overreport their beloved one’s life satisfaction 12 months prior to death.

Proxy’s Retrospective View of Late-Life Satisfaction Change

Table 3 shows results from a series of LDS models quantifying proxies’ retrospective view of life satisfaction decline 12 to 3 months prior to death. At the zero-order level (Model 1), results revealed that participants were viewed from their proxies to have experienced declines in life satisfaction declines over the last year of life (Proxy-reported change = $−1.16, p < .05$) that amount to an average of 1.2 raw scale units or 0.54 $SD$. This amount of change is
similar to previous studies examining change within 1 year of negative life events, such as spousal loss, unemployment, and disability (see Lucas, 2007a). Figure 2 illustrates those retrospective proxy reports about the deceased participants’ life satisfaction at 12 and 3 months prior to death in relation to age at death; proxies’ retrospective reports of their loved one’s life satisfaction within the last year of life included both stability and decline. After controlling for proxy 12-month reports of life satisfaction of participants, there were sizeable between-person differences in change ($\sigma^2 = 4.66, p < .05$), and in Models 2 and 3, we examined the extent to which these differences were related to proxy and participant characteristics. Results indicated that participants who were in poorer health ($\beta_{10} = -0.68, p < .05$) and proxies who reported lower life satisfaction ($\beta_{11} = 0.20, p < .05$) were more likely to perceive their loved one to experience a greater drop in life satisfaction with approaching death. Figure 3 graphically illustrates that proxies who reported their loved one being in poor health (Panel A) and themselves reported lower levels of life satisfaction (Panel B) were more likely to report their loved one to experience a sharper decline in life satisfaction within the last year of life.

**DISCUSSION**

The objective of this study was to examine the utility of proxy data to help us better understand end-of-life satisfaction in large-scale sample surveys. To do so, we utilized exit interview data from the German Socio-Economic Panel Study (SOEP) that uniquely assessed proxy reports of life satisfaction within the last year of life and examined the extent to which proxy reports on their loved ones’ life satisfaction mirrors and substantiates previous studies focusing on self-reports of life satisfaction. We also explored whether participant and proxy characteristics predicted congruence of life satisfaction reports 12–24 months prior to death and proxies retrospective view of participants late-life satisfaction change.

For our first research question, results revealed moderate agreement between self- and proxy reports ($r = .42$), but proxies, on average, overestimated in retrospect participants’ actual life satisfaction, and this discrepancy was magnified for proxies who were children and reported lower life satisfaction for themselves. For our second research question, proxies retrospectively reported declines in life satisfaction of their loved one over the last year of life, and these proxy-rated decrements were stronger if the participant was in poorer health and the proxy himself or herself reported lower life satisfaction. Results suggest that proxy reports may still be shaped by the recent loss of the loved one through grief, mourning, and missing that colors proxy recollections (Bowlby, 1961; Herrmann, 1995; Ross, 1989), but we were unable to address these psychological processes in the present report (see O’Connor & Arizmendi, in press).

Overall, our findings mirror and qualify theoretical expectations and empirical results based on self-report data that are typically available only until 1 or 2 years before death. We conclude that retrospective proxy reports in...
large-scale longitudinal surveys can be used at least as a hypothesis-generating tool to gather insights into late life and discuss the utility and limitations of this approach. We take our findings to suggest that detailed medical, functional, and health care service information about the last months of the deceased person would help us better understand individual differences in late-life well-being. To begin with, multisource information about the cause of and conditions surrounding death (as obtained from death certificates, medical records, proxy reports, etc.) may help us more thoroughly address whether or not late-life well-being differs between different medical conditions (e.g., cardiovascular disease vs. chronic lung disease). Our preliminary data suggest that individuals who suffered from prolonged illnesses (e.g., cardiovascular disease, cancer, and respiratory disease) would be more likely to experience lower levels of and declines in life satisfaction in the end of life. It is also possible that it is not only the mere physical illness people are suffering from but also the type of medicine and treatment they receive (e.g., in home nursing care or placement in assisted living home) and how much these interfere with the pursuit of daily life routines. It would thus be pivotal to explore the functional abilities late in life and how stable or fluctuating these were depending upon the medication regimen. Based on the current findings, we would speculate that individuals who were able to maintain independence while living at home would be best able to preserve their life satisfaction in the end of life. Finally, a careful examination of how well medical and personal needs were met by the family and health care professionals would also help us shed additional light on how people can preserve their well-being into the last phase. We would take our data to suggest that individuals whose advanced care directives were met would be more likely to report higher levels of and fewer declines in life satisfaction in the end of life (Silveira et al., 2010).

**Congruence Between Proxy and Self-Reports of Life Satisfaction**

Corroborating meta-analyses based on studies using population-based samples in various age ranges and reports from particular subpopulations, we found moderate agreement between self-ratings and retrospective proxy ratings of life satisfaction at the end of life (Schneider & Schimmack, 2009; Sneeuw et al., 2002). The effect sizes observed here ($r = .42$) are highly similar to those found in other areas of functioning for people in adulthood ($r = .42$; Schneider & Schimmack, 2009), with chronic disease ($r = .42$ to $r = .78$; Sneeuw et al., 1997, 1998, 2002), and in clinical settings with people who have personality disorders ($r = .36$; Silveira et al., 2010).
Our analyses from the SOEP suggest that although proxies, on average, overestimate self-reports of life satisfaction in the last year of life, there appears to be significant overlap and agreement between concurrent self-reports and retrospective proxy reports about life satisfaction at around 12–24 months prior to death. We note that the direction of the bias between self-reports and proxy reports may depend upon their concurrent or retrospective assessments. In particular, studies utilizing concurrent assessments often report that proxies underestimate self-reports of life satisfaction. For example, Bassett et al. (1990) reported that proxy ratings of life satisfaction by relatives and friends were higher than the self-ratings of elderly women, probably because people consider themselves to be generally more satisfied with life than other people and thus, on average, rate others lower than they actually are (Cummins, 2002). We argue that the key to understand the reversed bias in the SOEP ratings lies in their retrospective nature. In particular, proxies most likely needed to think back more than 1 year ago (1 year + time since death of loved one) to make their life satisfaction assessment, with many different processes possibly affecting their reports (e.g., motivational bias, heuristics, or reference points; Herrmann, 1995; Ross, 1989). It is also possible that with late-life ailments and possible caregiving needs, further attribution mechanisms may become of growing importance. Specifically, if proxies were in the care giving role, they may have wanted to believe that the people in their care indeed benefitted from the support and thus rated them higher on life satisfaction than they actually were (see also Cummins, 2002).

We also examined whether characteristics of the participant and proxy moderated congruence in life satisfaction reports 12–24 months prior to death. Larger congruence was observed if the proxy was a spouse and reported higher life satisfaction. Spouses are more likely to have the greatest insights into their loved one’s ideals and knowledge about actual life circumstances, thereby providing a closer approximation of their life satisfaction (Schneider & Schimmack, 2009). Proxies who report better life satisfaction may be in a better cognitive-evaluative state of mind and more sensitive to their loved one’s abilities and the challenges they faced, which may in turn result in more accurate assessments. We note that proxies may be more likely to overestimate their loved one’s initial life satisfaction in retrospect when their last months were subsequently accompanied by major losses. For example, bereavement effects are often strong and assessments following death of a loved one may bias retrospective proxy reports (Lucas, 2007a; Stroebe & Schut, 1999).

Targeting mean-level differences between self- and proxy reports, we note that the level shift was found to be consistent across groups of varying age at death, gender, cognitive impairment, and cause of death, a pattern we corroborated in follow-up analyses contrasting these groups with one another. Setting limitations in statistical power aside, our report suggests that proxy reports provide a reasonable approximation of the between-person differences in self-reports, with the caveat that retrospective proxy reports, on average, overestimate self-reports of satisfaction. Looking beyond significance tests and more closely at our results in Table 2, we can tentatively discuss that the effect sizes for age and health status of participants may play a role in determining (in-)congruence between participant and proxy life satisfaction reports. Using the parameter estimates from Table 2, we calculated that for an average 80-year-old participant in our study, the difference between self- and proxy reports at 12 months prior to death would be −0.54, whereas for an average 50-year-old participant, the difference would be −0.85. Furthermore, better health status of the participant (+1 SD) would result in a difference of −0.39, whereas for a participant with poorer health status (−1 SD) there would be larger difference of −0.87. It is possible that we did not have a sufficiently large sample for these associations to be reliably different from zero (i.e., sample size should not necessarily affect the size of the coefficient, but the standard errors), which warrants future research in this direction.

Proxy’s Retrospective View of Late-Life Satisfaction Change

Proxies retrospectively reported declines in participants’ life satisfaction within the last year of life. Our findings may reflect the proxies’ understanding of the difficulties their loved one was faced with in the last year of life. It is possible that proxies observed participants’ late-life ailments and thus used those as a reference point for their life satisfaction ratings at 3 months prior to death and thereby also, on average, overestimated life satisfaction at 12 months before death. Unfortunately, the available data did not allow an examination of the reference point that proxies used when making their judgments regarding their loved ones life satisfaction change within the last year of life, but would be a warranted extension of exit interviews for inclusion in ongoing longitudinal surveys.

Of the available participant and proxy characteristics, we only found that participants’ health status and proxies’ life satisfaction were associated with change in life satisfaction during the last year of life in the retrospective perspective of the proxy. Our findings suggest that proxies may take into account one’s overall health status. We did not have information pertaining to factors that proxies may take into account when forming their evaluations, but such cues could include objective health indicators such as physical functioning and chronic illnesses. Health constraints could result in their beloved ones to feel less satisfied with their lives when they are beset with the challenges of living with serious illness (Charles, 2010). For proxy life satisfaction, it is possible that proxies’ life satisfaction may have been
affected by their loved one’s recent death (e.g., life satisfaction declines with parental and partner death; Gerstorf et al., 2012; Lucas, 2007a) and lower life satisfaction as a result may paint a more negative picture of how their loved one experienced the last year of their life (Herrmann, 1995; Ross, 1989).

Taken together, our evidence suggests that retrospective proxy reports provide an insightful picture about how the last year of life is experienced, but they are also biased in important ways. This may be taken into account in clinical and palliative settings. Proxy reports probably underestimate and thus represent a conservative estimate of the challenges that end-of-life processes impose onto self-regulation. These reports are shaped by the grief about the recent loss but can be taken to provide insights into various factors that undermine life satisfaction in the last years of life (e.g., health).

**Potentials and Limits of Using Exit Interviews for Examining Late Life**

Our approach and findings showcase the utility of exit interviews for understanding late-life development. Exit interview data in large-scale longitudinal surveys can provide researchers insights into late-life experiences that are otherwise difficult to assess in annual or biennial panel surveys. It is possible that long-term respondents in an ongoing longitudinal study, like SOEP, HRS, or PSID, who rated their own life satisfaction several times are more able to give accurate proxy reports than first time raters (which is typically the case in hospitals and palliative units). We hope that our study provides impetus for further in-depth research into the utility of proxy reports through available exit interview data. Uncovering the potentials and limitations of such retrospective proxy reports is particularly important because many large-scale longitudinal studies have collected such data, but it is only recently that these sources of data are systematically utilized within the areas of advance medical directives and community and health resource utilization within the last year of life (Silveira et al., 2010).

Our study offers initial insights into late-life satisfaction and operates as a hypothesis-generating instrument to provide impetus for future analyses. First, proxies reported declines in life satisfaction for their loved one across the last year of life. It appears conceivable that self-reports taken 2 or 3 years prior to death underestimate the challenges and impairments that the last year of life imposes. To more thoroughly assess functioning late in life (and more generally in relation to major life events), longitudinal surveys should consider incorporating more closely spaced assessments (e.g., 3–6 month intervals) or measurement-burst designs for certain segments of the survey. For example, the HRS has incorporated an internet survey for a subsample in off years beginning in 2007. More closely spaced observations and measurement-burst designs would allow for gathering information about the weeks or months surrounding an event. For example, is late-life decline in life satisfaction accompanied by increased variability or fluctuations in one’s own life satisfaction and that of their spouse? Furthermore, are there disruptions in one’s life satisfaction or emotional stability prior to and thus foreshadow the onset of disability or disease incidence? Second, one of the pivotal questions to be answered in future research is whether the reported associations between proxy reports of life satisfaction and late-life conditions (e.g., poor health and disability) can be replicated with self-report. For example, proxies rated declines in life satisfaction within the last year of life to be stronger for participants who were disabled or in poorer health. Therefore, objective and subjective health indicators may be candidate factors to include in future analyses to assess whether they moderate level and changes in self-reports of life satisfaction in relation to death (Gana, Vailly, Saada, Joulain, & Alaphilippe, in press; Windsor, Burns, & Byles, 2013). Future analyses can help corroborate whether participants who experience disability over the course of their life or died from prolonged illnesses are indeed at greater risk for life satisfaction decrements at the end of life. Proxies have knowledge of conditions that people are faced with at the end of life and in combination with self-report data can help researchers to get a more comprehensive view of late-life conditions and quality of life.

Finally, we observed that proxies who themselves reported lower levels of life satisfaction were, on average, more likely to overestimate their loved one’s life satisfaction 12 months prior to death. Such overestimation can be considered an adaptive attempt of the bereaved proxy to cope with the recent loss, particularly when the final phase of life was accompanied by serious functional deteriorations and suffering. It would thus be instructive to examine in future studies whether such protective idealization can be replicated and is linked to buffering the behavioral and biological changes that often result from sustained periods of unpleasant emotions (Pressman & Cohen, 2005). These findings also highlight that taking into account proxy feelings and characteristics helps in evaluating the accuracy of proxy reports (Herrmann, 1995; Ross, 1989).

**Limitations and Outlook**

In closing, we note several limitations of our study. First, inherent biases in using proxy reports for subjective indices have long been acknowledged (Cummins, 2002). We agree and note that substantial mean-level shifts were observed. At the same time, we observed moderate rank-order stability in life satisfaction ratings between self-reports and retrospective proxy reports. For example, those who rated themselves to be satisfied with their lives
at 12–24 months prior to death were also more likely to be rated retrospectively by their proxies to have been satisfied with their lives 12 months before their death ($r = .42$). Second, we had no information available on the reference point proxies used for their estimations. As our follow-up analyses indicated, proxy reports were to a considerable degree made by referring back more than 1 year ago. Future studies should ask proxies whether they used or ask proxies to use an anchor or reference point for their life satisfaction estimates, which may allow for better understanding how proxies interpret this question (Herrmann, 1995; Ross, 1989). Third, we note that proxies rather than participants themselves rated participant characteristics regarding their cognitive and health functioning. This may imply that proxies who rate their loved one to perform poorly in one area, such as health, may also rate the other domains similarly and less differentiate across the various behavioral areas of functioning. We acknowledge that we were unable to corroborate these assessments with physicians’ ratings. Fourth, we note that we could not test disease-specific trajectories. Symptomatology and health problems vary and are different, for example, for cancer and cardiovascular disease, which may influence proxy well-being reports. To illustrate, one would expect that congruence would be greater for participants with observable, specific behavioral limitations as a result of arthritis or stroke that would manifest as having difficulty with cooking or bathing. In future studies, it would be helpful to link participant and proxy reports of physical health functioning and target specific diseases in the context of longitudinal surveys. Lastly, our proxy data were limited in the scope and depth. A more comprehensive description of late-life functioning and change would require a combined collection of self-report and proxy report data. For example, longitudinal data available in the years leading up to death can be combined with proxy data within the last year of life to examine whether and how psychological and health changes prior to death may or may not influence life satisfaction in the last year of life.

We take our findings to lend support to the viability of utilizing the retrospective life satisfaction reports of significant others where this is necessary. In doing so, researchers need to carefully attend to the positive mean-level bias introduced by effects of bereavement and other processes that shape an individual’s frame of reference, including the knowledge, experiences, attitudes, and beliefs of the proxy. Our results suggest that proxy reports of late-life satisfaction mirror, substantiate, and expand upon both substantive expectations and earlier empirical results based on self-report data that are typically available only until 1 or 2 years before death. Information based on exit interview data can provide meaningful insights into how people experience the last year of life across a variety of domains, including life satisfaction, cognitive and physical health abilities, and cause of death.

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**Correspondence**

Correspondence should be addressed to Frank J. Infurna, PhD, Institute of Psychology, Humboldt University of Berlin, Unter den Linden 6, 10099, Berlin, Germany. E-mail: frank.j.infurna@hu-berlin.de.

**References**


Funder, D. C. (2003). Toward a social psychology of person judgments: Implications for person perception accuracy and self-knowledge. In...


