Until Death Do Us Part:

The Codevelopment of Life Satisfaction in Couples Preceding the Death of One Partner

Jenna Wünsche

University of Basel, Switzerland

Rebekka Weidmann

University of Basel, Switzerland

Alexander Grob

University of Basel, Switzerland

Wünsche, J., Weidmann, R., & Grob, A. (2019). Until death do us Part: The codevelopment of life satisfaction in couples preceding the death of one partner. *Journal of Personality and Social Psychology*. doi:10.1037/pspi0000228

Author Note

Jenna Wünsche, Rebekka Weidmann, Alexander Grob, Department of Psychology, University of Basel, Switzerland.

The first author was funded by a research-project grant of the Swiss National Science Foundation (project number 100019_162697). We thank Robert Burriss for his valuable comments on the manuscript.

Correspondence concerning this article should be addressed to Jenna Wünsche, University of Basel, Missionsstr. 62, 4055 Basel, Switzerland. Phone: +41-(0)61-207-58-43, Email: jenna.wuensche@unibas.ch

© 2019, American Psychological Association. This paper is not the copy of record and may not exactly replicate the final, authoritative version of the article. Please do not copy or cite without authors' permission. The final article will be available, upon publication, via its DOI: 10.1037/pspi0000228

Abstract

This work aims to integrate previous research perspectives on terminal well-being decline and partner bereavement by investigating the codevelopment of life satisfaction in the years preceding the death of one partner. We analyzed longitudinal data from the German Socio-Economic Panel Study ($N = 1,450$ couples) and applied dyadic multilevel models to estimate both partners' trajectories of life satisfaction and to reveal the pathways of well-being transmission in couple members approaching [partner] death. Findings were compared to a propensity-score-matched control sample of couples in which neither partner died during the study. We found that to-be-deceased and to-be-bereaved partners experienced increasing disparities in their trajectories of life satisfaction in the years before [partner] death: Although both partners exhibited significant and accelerated declines in life satisfaction, these declines were more pronounced in to-be-deceased individuals. In the control sample, we also identified significant and accelerated declines in life satisfaction but these declines were less intense and they did not differ between partners. Regarding between-partner correlations, we observed that couples approaching [partner] death experienced weaker interdependencies in their declines of life satisfaction. Finally, and concerning the pathways of well-being transmission, we found that life satisfaction was significantly transmitted between partners and the strength of this effect did not differ between the samples. These findings suggest that the years before [partner] death are characterized by distinctive patterns of change and interdependence in life satisfaction. Future studies may explore the sources of increasing between-partner disparities in life satisfaction in an end-of-life relationship context.

Keywords: life satisfaction, couples, codevelopment, end-of-life, bereavement, SOEP

Until Death Do Us Part:

Codevelopments of Life Satisfaction in Couples Preceding the Death of a Partner

... for better, for worse, for richer, for poorer, in sickness and in health, until death do us part.

Rite of Marriage (#25)

This well-known wedding vow captures the widely-held expectation that partners will share each other's ups and downs to the end of their days and it is supported by an increasing number of studies that have identified longitudinal interdependencies in subjective well-being among romantic partners (e.g. Hoppmann, Gerstorf, Willis, & Schaie, 2011; Orth, Erol, Ledermann, & Grob, 2018; Schimmack & Lucas, 2010; Wortman & Lucas, 2016). So far, however, it remains unclear how these interdependencies evolve until the end of the [romantic] lifespan. Therefore, the current study zooms into the last years of a romantic relationship to investigate the codevelopment of life satisfaction in couple members approaching the death of one partner. Combining previous lines of well-being research on terminal decline and spousal bereavement, we aim to shed light on the dyadic nature of life satisfaction in to-be-deceased and to-be-bereaved partners and we seek to reveal whether couple interdependencies in subjective well-being persist "until death do us part".

Codevelopment of Life Satisfaction in Couples

Life satisfaction, or, our "liking or disliking" of life in general (Heller, Watson, & Ilies, 2004, p. 1), has been subject to a myriad of studies that have aimed to explain individual differences and long-term changes in this cognitive dimension of subjective well-being (Diener, Oishi, & Lucas, 2003). More recently, studies have taken an interpersonal perspective when investigating the sources of within- and between-person variability in life satisfaction (e.g. Hoppmann et al., 2011; Orth et al., 2018; Schimmack & Lucas, 2010; Wortman & Lucas, 2016).

These approaches are worthwhile as they acknowledge the contextualized nature of human development (Baltes, 1987; Bronfenbrenner, 1979) and how it is embedded in meaningful social environments, which shape individual behaviors and experiences through dynamic, continuous, and reciprocal processes of transaction (Magnusson, 1990). Given that romantic relationships could be thought of as the closest and most meaningful relationships that individuals encounter in adulthood, it is unsurprising that the developmental unit of the couple has received increasing attention in research on life satisfaction.

Kelley et al. (1983) state that “the close relationship is one of strong, frequent, and diverse interdependence that lasts over a considerable period of time” (p.38). Hence, experiencing interdependence in emotions and cognitions is considered almost a characterizing component of close relationships (Sels, Ceulemans, Bulteel, & Kuppens, 2016). In fact, both cross-sectional (Bookwala & Schulz, 1996; Goodman & Shippey, 2002; Townsend, Miller, & Guo, 2001) and longitudinal studies (e.g. Hoppmann et al., 2011; Orth et al., 2018; Schimmack & Lucas, 2010; Wortman & Lucas, 2016) have shown that happiness is not a “private affair” (Gustavson, Røysamb, Borren, Torvik, & Karevold, 2016, p. 1306), but is closely related to the well-being of a person’s loved ones. Spouses participating in the German Socioeconomic Panel Study, for instance, exhibited substantial similarities in trait and state life satisfaction across two decades (Schimmack & Lucas, 2010). Similar patterns of partner codevelopments were also found for couples in the Seattle Longitudinal Study (Hoppmann et al., 2011): Spouses not only reported similar levels of happiness (level correlation of $r = .51$) but their longitudinal changes in happiness was also highly interdependent (slope correlation of $r = .77$). Another recent study aggregated findings from five samples of couples and provided support for substantial longitudinal transmission effects of life satisfaction and emotional well-being between partners (Orth et al., 2018).

In addition, couple members who experience major transitions in their life also tend to report similar changes in life satisfaction. These interdependencies were observed along the

transition into parenthood (Dyrda & Lucas, 2013) but also for the experience of job loss (Luhmann, Weiss, Hosoya, & Eid, 2014), suggesting that both partners' satisfaction with life is susceptible to changes in their shared environment. Similarly, spousal similarities in life satisfaction were found to fade after spouses divorced (Wortman & Lucas, 2016), illustrating the role of interpersonal co-dynamics and shared life circumstances as sources of couple interdependencies in well-being.

The above findings underline the importance of considering the couple as a developmental unit so as to gain a more profound understanding of inter-individual differences in intra-individual development—what has been described as one of the central objectives of research in lifespan psychology (Baltes & Nesselrode, 1979). In the current study, we expand upon previous research on codevelopments of subjective well-being in couples by exploring the changes and between-partner interdependencies in life satisfaction in the uniquely stressful context of impending [partner] death.

Subjective Well-Being in the Context of Impending [Partner] Death

A considerable amount of literature suggests that subjective well-being remains stable or increases in old age despite age-related physical, cognitive, and social losses (Blanchflower & Oswald, 2008; Carstensen et al., 2011; Diener & Suh, 1997; Gana, Bailly, Saada, Joulain, & Alaphilippe, 2012; Hamarat, Thompson, Steele, Matheny, & Simons, 2002; Stone, Schwartz, Broderick, & Deaton, 2010). This developmental trend has been referred to as the well-being paradox of old age and has been associated with a more proficient use of self-regulatory strategies in late adulthood (Brandtstädter & Greve, 1994; Kunzmann, Little, & Smith, 2000). Socio-emotional selectivity theory (Carstensen, Fung, & Charles, 2003) provides a prominent explanation for age-related gains in well-being in an end-of-life context. According to this theory, a limited future time perspective leads to an increased motivational focus on positive and emotionally meaningful experiences. As a result, older adults tend to rely on a repertoire of emotion regulation strategies that helps to “selectively construct a

social and cognitive world that maximizes emotional payoffs” (Carstensen et al., 2003, p. 119), for example through a selective prioritization of positive information and emotionally close interaction partners. Recent work on life satisfaction in the context of impending [partner] death has, however, challenged the notion that old age is characterized by stable or enhancing experiences of well-being (e.g. Gerlach et al., 2017; Gerstorf et al., 2010; Infurna et al., 2016). These studies have investigated late-life changes in subjective well-being from two individual level perspectives, either focusing on end-of-life trajectories of subjective well-being in to-be-deceased individuals or tracking changes in subjective well-being in individuals approaching the death of their partner. We will first summarize evidence from both lines of research and will then argue for a combined—or dyadic—investigation of the changes and interdependencies in subjective well-being in the years leading up to the death of one partner.

To-be-deceased perspective. Relying on large longitudinal datasets and following an end-of life approach to subjective well-being, studies have shown that the trajectories of life satisfaction are relatively stable up until late in life. Nevertheless, as individuals approach the year of their death, they tend to enter a phase of rapid deterioration in life satisfaction (Gerstorf, Ram, Estabrook, et al., 2008; Gerstorf et al., 2010; Gerstorf, Ram, Röcke, Lindenberger, & Smith, 2008; Mroczek & Spiro III, 2005). This process has been referred to as terminal decline—“the change that accrues as time runs out” (Gerstorf & Ram, 2015, p. 211). Terminal decline begins, on average, at around three to five years before death (Gerstorf et al., 2010), suggesting that in these last years of life, individuals experience developmental losses and challenges that outweigh the regulatory capacities that had been effective in earlier phases of life (Mueller, Wagner, Wagner, Ram, & Gerstorf, 2018).

Considering the well-documented link between health and well-being (Diener & Chan, 2011; Hudson, Lucas, & Donnellan, 2019; Kööts-Ausmees & Realo, 2015; Steptoe, Deaton, & Stone, 2015), these patterns of terminal well-being decline are most likely related to rapid

deteriorations in other domains of functioning. Previous studies have, for instance, documented terminal decline in the cognitive, physical, and emotional domain (for a review see Cohen-Mansfield, Skornick-Bouchbinder, & Brill, 2017). Chochinov et al. (2009) captured the more subjective “landscape of distress” (p. 641) as experienced by individuals facing the end of their life. According to self-reports of terminally-ill patients, this phase of life is most frequently characterized by unrelieved physical symptoms and functional limitations (i.e. a reduced capacity to carry out routines, activities of daily living and important roles), as well as existential issues that involve feelings of no longer being the same person one used to be, a lack of perceived control, and a fear of being a burden to others. Experiencing a lack of control and a limited functional capacity was experienced as particularly stressful by patients who had a partner or by those who lived with someone else. It was, therefore, concluded that the burden of physical limitations may be intensified by the everyday presence of close others who witness the experienced limitations (Chochinov et al., 2009). These results reinforce the necessity of accounting for the interpersonal living context (i.e. the couple relationship) when investigating end-of-life developments.

In fact, a considerable proportion of individuals enters old age and the terminal phase of their lives as a member of a romantic relationship. According to microcensus data (Destatis, 2018), 40% of older adults in Germany (65+ years) live together with their married partner. That is, when investigating terminal well-being decline, it is crucial to also take into account the complementary caregiving perspective of partners approaching bereavement as well as the co-dynamics resulting from the shared experience of impending [partner] death.

To-be-bereaved perspective. Despite its normative character (Havighurst, 1972; Hutteman, Hennecke, Orth, Reitz, & Specht, 2014), the death of a partner is considered one of the most stressful life events experienced in adulthood (Dohrenwend, Askenasy, Krasnoff, & Dohrenwend, 1978; Holmes & Rahe, 1967; Paykel, Prusoff, & Uhlenhuth, 1971), with important implications for physical and mental health (Stroebe, Schut, & Stroebe, 2007) and

well-being (Anusic & Lucas, 2014; Infurna et al., 2016; Lucas, Clark, Georgellis, & Diener, 2003). The transition into partner bereavement has been divided into three developmental stages, each posing different challenges to adjustment: (1) an anticipation phase, describing the years leading up to bereavement; (2) a reaction phase, describing the time around the event of partner death; and (3) an adaptation phase, describing the years after the death of a partner (Infurna et al., 2016).

Some prospective longitudinal studies have explored changes in subjective well-being across all phases of the experience of bereavement, including the anticipation phase. These studies reported that life satisfaction rapidly declines as individuals approach the death of a partner. That is, subjective well-being begins to deteriorate some years before partner death (Anusic & Lucas, 2014; Infurna et al., 2016; Lucas et al., 2003; Yap, Anusic, & Lucas, 2012), suggesting a foreshadowing effect of bereavement. Infurna et al. (2016) identified anticipation effects from around 2.5 years before partner death. Other studies also observed higher levels of depressive symptoms, decreased functional and cognitive health, as well as lower levels of quality of life among to-be-bereaved persons when compared to their continuously married counterparts (Bourassa, Knowles, Sbarra, & O'Connor, 2016; Vable, Subramanian, Rist, & Glymour, 2015).

This pre-bereavement deterioration of health and well-being most likely reflects a reaction to a multitude of challenges and losses that are faced by spouses who accompany their increasingly weakened partner. Along with the physically and mentally burdensome experience of caregiving (Kaschowitz & Brandt, 2017; Schulz & Sherwood, 2008), these challenges involve an increased feeling of insecurity, worries about the partner and about the couple's limited remaining time together, a decreased sense of control, a loss of mobility, and a sense of overwhelming responsibility, i.e. for managing the partner's treatment plan (Evans, 1994; Gardner, 2008; Nielsen, Neergaard, Jensen, Bro, & Guldin, 2016; Schulz & Sherwood, 2008). An interview participant living with a terminally ill partner described his situation as

follows, providing a powerful illustration of the experienced uncertainty and distress from a caregiver perspective: “You know, when you have a wife or a spouse with cancer, every day is torture. And I walk out of the house in the morning and I wonder what things are going to be like when I get home at night. And it’s a constant worry because I know that eventually she’s going to die of this. And the question is, will she die in ten years or will she die in one year? That’s a big thing to carry around [...]” (Gardner, 2008, p. 148). The context of caregiving and impending [partner] death, therefore, needs to be understood as a chronic stress experience that can be harmful to the physical, mental and subjective well-being of to-be-bereaved partners (Schulz & Sherwood, 2008).

Merging the perspectives. In sum, individual-level evidence challenges the well-being paradox of old age and suggests that the context of impending [partner] death represents a chronically stressful experience that appears to exceed the otherwise effective regulatory capacities of older adults. In fact, previous studies have demonstrated that to-be-deceased and to-be-bereaved individuals experience very similar changes in life satisfaction in the years before [partner] death. According to theoretical notions and empirical evidence on couple attunements as well as end-of-life well-being, there are at least three different sources of observable similarities in life satisfaction in couples approaching [partner] death.

First, and as outlined above in the discussion of individual-level research perspectives, both partners’ well-being is challenged by their unique personal experiences (i.e. mortality-related declines of functioning, the burden of caregiving), which are inherent to the experience of impending [partner] death, and which can lead to similar—but not necessarily interdependent—declines in well-being.

Second, and widely neglected so far by prospective longitudinal studies, the years preceding [partner] death are experienced and embedded within the developmental unit of the couple. Following an interdependence theoretical perspective (Rusbult & Van Lange, 2008), similar end-of-life changes in well-being can thus be explained by interpersonal processes that

take place between to-be-deceased and to-be-bereaved individuals. Partners may shape each other's patterns of well-being in different ways (Butler, 2015; Schoebi, 2008): directly, through less conscious processes of emotional contagion and transmission (Hatfield, Cacioppo, & Rapson, 1993; Larson & Almeida, 1999); or indirectly, through emotionally-charged behaviors and interactions with the partner that result in interpersonal cross-overs of affective states (e.g. through hostile communication styles, Westman, 2001) but also through more active and controlled attempts to regulate the partner's emotional state (e.g. through physical touch, Debrot, Schoebi, Perrez, & Horn, 2013). In addition to these emotional co-dynamics, couple members may also affect each other's subjective well-being on a cognitive level. That is, partner well-being can serve as an important source of information and as an anchor when judging one's personal satisfaction with life (Gustavson et al., 2016; Powdthavee, 2009). Consequently, the life satisfaction of to-be-deceased and to-be-bereaved individuals is, at least to some extent, shaped by their partner's state of well-being.

Third, and lastly, similar and interdependent trajectories of life satisfaction in couples facing [partner] death do not necessarily reflect the sole outcome of both partners influencing each other. Following a shared resources perspective (Orth et al., 2018; Schimmack & Lucas, 2010), to-be-deceased and to-be-bereaved partners may also “wax and wane together” (Hoppmann et al., 2011, p. 2) because they experience similar changes in their life circumstances (e.g. through reduced financial resources and opportunities for social participation) that affect both couple members in similar but independent ways.

It should be emphasized that the described sources of similar changes in life satisfaction are not mutually exclusive but that they are themselves highly intertwined and may also apply to other challenging life transitions that can be experienced within a couple. These dynamics may, however, unfold with a unique intensity in an end-of-life relationship context, resulting in characteristic patterns of interdependence between partners. The uniqueness of this stage of life is likely to be grounded in a novel and ongoing quality of

physical and emotional suffering that is experienced and witnessed by both partners; a perceived threat of discontinuity; an unclear future time perspective regarding the self and the romantic relationship; as well as an intensified pattern of support and care provision (Carstensen et al., 2003; McLean & Jones, 2007). We argue that these chronic stress factors challenge the regulatory capacities of both partners as much as they amplify the salience of partner well-being in this phase of life, ultimately resulting in an increased permeability for partner well-being in an end-of-life context. Following this line of argumentation, we expect stronger between-partner correlations in the levels and changes of life satisfaction as well as stronger between-partner transmission effects of life satisfaction in couple members facing [partner] death as opposed to couples who are not experiencing this developmental challenge.

The Present Study

So far, the experience of impending death and terminal decline has been investigated from the perspective of the dying person, while the perspective of the surviving partner has been addressed by a second but independent line of research on bereavement. The present study integrates these two individual-level research perspectives, acknowledging the contextualized nature of development until the end of [partner] life and capturing the intertwined experiences of romantic partners. To that end, we examine the trajectories of life satisfaction in to-be-deceased and to-be-bereaved individuals at the couple level. We rely on representative household data from Germany and employ a dyadic multilevel approach to investigate the codevelopment of life satisfaction in couple members approaching [partner] death, while comparing them against a sample of couples in which neither partner died during the study. Incorporating couple-level data allows us to capture the interdependent nature of life satisfaction in this developmental context more thoroughly. Following this approach, we predict that couple members facing [partner] death experience declines in life satisfaction that will not be observed among couple members who do not find themselves in this phase of life. Moreover, we expect strong between-partner interdependence in life satisfaction, as indicated

by strong correlations in the estimated growth parameters and significant transmission effects of life satisfaction between partners in both samples of couples. Finally, we hypothesize that the strength of between-partner interdependence (i.e. between-partner correlations and transmission effects) is stronger in couples approaching [partner] death.

Methods

The current study uses 32 years of observation of household members participating in the German Socio-Economic Panel Study (SOEP) to model changes and interdependencies in life satisfaction in couples approaching the death of one partner. To be able to draw conclusions about whether these developmental patterns are characteristic of couple members approaching [partner] death, we performed the same set of analyses for a propensity-score-matched control group of couples in which neither partner died during the study period.

Sample

The SOEP is an ongoing representative panel survey of Germany's resident population that has been conducted since 1984. The initial sample of households ($N = 5,921$) and subsequent enlargement samples were selected in a multi-stage random sampling procedure. Currently, the SOEP panel comprises 30,000 individuals belonging to 15,000 households. Data are collected on a yearly basis, via computer-assisted personal interviews that are conducted with all household members aged 16 years or older. For long-term participants, it is also possible to provide information via self-administered paper-pencil questionnaires. Information regarding the situation of the entire household are provided by the head of each household. On a general level, the SOEP aims to capture a broad set of objective and subjective indicators of well-being and it is suitable for exploring life course developments within household contexts and across large time spans (Goebel et al., 2019). The richness of the SOEP data has been valued by previous studies that investigated couple interdependencies in life satisfaction as well as terminal and anticipatory well-being declines in the years before death and conjugal bereavement (see supplemental material for the list of studies). So far,

however, no study has used the SOEP data to explore the codevelopment and transmission of life satisfaction in the shared and uniquely stressful context of impending [partner] death.

For the present analyses, participants were selected from all available SOEP waves (1984 – 2015) if they met the selection criteria for the event sample (male/female couples in which one partner died in the course of the study) and the control sample (male/female couples in which no partner died).

Event sample. According to SOEP records, 6,119 participants died between 1984 and 2015. Based on this sample of deceased participants, we applied the following five selection criteria to identify couples for our event sample.

First, as mentioned before, previous evidence suggests that terminal declines in to-be-deceased individuals and anticipatory declines in to-be-bereaved individuals begin at around three to five years prior to death (Gerstorf et al., 2010) and at 2.5 years prior to partner death (Infurna et al., 2016). To capture changes and interdependencies in life satisfaction in these critical years leading up to [partner] death, we only included deceased individuals if they had a partner and if they had reported they were in a relationship with each other for at least three years before [partner] death. Of the 6,119 participants who had died during the study 2,172 couples (i.e. 2,172 deceased individuals and their partners) met this criterion.

Second, we only included couples in which one couple member died in the course of the study ($N_{\text{couples}} = 2,072$), excluding couples in which both partners died at some point while participating. We made this selection to control for the possibility that both partners simultaneously experience mortality-related and bereavement-related processes in the years leading up to the death of one partner. Since this study aims to reveal mortality-related and bereavement-related changes in life satisfaction within couple members and their interdependencies across couple members it is important to keep the potential for confounding experiences at the lowest (possible) level.

Third, we only included couples in which neither partner had lost another partner in any of the previous or following waves ($N_{\text{couples}} = 2,058$), excluding participants and their respective partners, if they experienced more than one partner death in the course of the study. We decided upon this criterion to control for potential habituation effects with regard to the experience of partner death among to-be-bereaved partners and to rule out the possibility that participants appear in more than one dyad (in the same or in different roles).

Fourth, to be capable of accurately estimating changes and interdependencies in life satisfaction in the critical years leading up to [partner] death, we only included couples in which both partners provided information on life satisfaction in (at least) the three years leading up to [partner] death ($N_{\text{couples}} = 1,609$).

Finally, we only included couples in which both partners provided information on the variables relevant for the propensity score matching (age, education, disability status, employment status, parental status), leaving a final sample of 1,450 male/female couples¹.

Control sample. We selected a control sample so as to compare the trajectories of life satisfaction in couples approaching and not approaching [partner] death. For the control sample, we set the following five selection criteria: First, we selected individuals who neither died nor experienced partner death while participating ($N_{\text{individuals}} = 104,540$) and second, who had been in a relationship with the same partner for at least three years before they last participated in the survey ($N_{\text{individuals}} = 27,882$). Third, we selected participants and their respective partners ($N_{\text{individuals}} = 27,194$) if they participated as part of only one dyad. Fourth, we only selected couples in which both partners provided at least three consecutive measurement points for life satisfaction in the years leading to their last survey participation. We relied on these rather strict selection criteria with regard to the three last measurement points, to increase comparability with the event group and to guarantee identical preconditions to detect a potential quadratic effect of time in the later years of their participation. 11,080 couples fulfilled these criteria. Finally, we could only retain male/female

couples in which both partners provided information on the matching variables, leaving us with a control sample of 9,255 for the propensity score matching.

Propensity score matching. To ensure that couples in the event sample and the control sample were similar with regard to characteristics that may be associated with experiencing [partner] death at a later point in the study, we employed a propensity score matching procedure. We used the MatchIt package (Ho, Imai, King, & Stuart, 2007) in R (R Core Team, 2016) to estimate couple-level propensity scores for the experience of [partner] death and relied on both partners' age, education, disability status, marital status, employment status, and parental status at the first wave in which both partners participated as a couple. The choice of the current matching variables was based on their empirical link with mortality (e.g. Grundy & Kravdal, 2007; Lundin, Lundberg, Hallsten, Ottosson, & Hemmingsson, 2010; Park, Oh, Roh, & Moon, 2017) but was also contingent upon their availability throughout the entire study period. Relying on a broader set of mortality-related factors, including but not limited to medical conditions, doctor visits, and social participation, would likely have optimized the prediction of [partner] death within the study. These variables were, however, not continuously assessed throughout the entire SOEP study, resulting in a lack of baseline information on these characteristics for some participants. To limit further reductions in sample size, we decided to rely on the current selection of mortality-related matching variables (i.e., age, education, disability status, marital status, employment status and parental status) to predict [partner] death within the study.

Couples in the event sample ($N_{\text{couples}} = 1,450$) were then matched to couples in the preliminary control sample ($N_{\text{couples}} = 9,255$) based on their estimated propensity to experience the death of one partner².

Measures

Life satisfaction. In each wave, participants were asked to rate the single-item question "All things considered, how satisfied are you with your life?" on a scale ranging

from 0 (*totally dissatisfied*) to 10 (*totally satisfied*). To increase comparability with previous research on terminal well-being declines (e.g. Gerstorf et al., 2014), life satisfaction scores were transformed into a T-metric, relying on life satisfaction scores of the entire SOEP 2002 sample as a reference ($M = 6.90$, $SD = 1.81$). Participants in the event sample reported a mean life satisfaction of 45.41 ($SD = 12.80$) in the year before [partner] death; participants in the matched control sample reported a mean life satisfaction of 50.48 ($SD = 10.40$) in the year before they last participated in the survey.

Years-to-event. The trajectories of life satisfaction were modeled as a function of years-to-[partner] death in the event sample and as a function of years-to-last survey participation in the control sample. Information on mortality status was provided by remaining household members and neighbors or retrieved from official registers. Both years-to-event indicators were defined as the time in years from a given survey year to the year of event or the year of last survey participation, respectively. The maximum time-to-event was 32 years in both samples. For the statistical analyses, years-to-[partner] death as well as the years-to-last survey participation variable were centered at one year before the event. This allowed us to interpret the retained intercept parameters as levels of life satisfaction in the year before [partner] death or in the year before last survey participation. We decided against centering the time-to-event variables around the actual year of event because couple observations were extremely rare for the actual year of [partner] death ($N = 30$).

On average, couple members in the event sample participated 11.73 ($SD = 6.94$) times before the year of [partner] death. Couples in the control sample participated 10.90 ($SD = 6.97$) times.

Matching variables. Age was included as chronological age. As an indicator of education, we relied on both partners' completed years of education. *Disability status* (0 = *no certified disability status*, 1 = *certified disability status*) has been measured with the question "Are you legally classified as disabled or having a reduced ability to work for medical

reasons?”. *Employment status* was coded as (0 = *not employed*, 1 = *employed*). Male parental status has only been assessed since 2001, while female parental status has been assessed since the beginning of the study. Consequently, there was a lack information on male partners’ parental status if the event of [partner] death occurred before 2001 (or if they withdrew from the study before this point in case of the control sample). To still consider this mortality-related matching variable and to be consistent across couples participating in different survey years, we decided to rely on female *parental status* (0 = *no natural or adopted child*, 1 = *at least one natural or adopted child*) as a couple-level matching variable.

Table 1 shows the characteristics of the event sample and the matched control sample, both at first couple assessment and in the year before [partner] death or last survey participation.

Statistical Approach

We employed multilevel dyadic growth models (Kashy & Donnellan, 2008) and incorporated a longitudinal actor-partner interdependence approach (Kenny, 1996; Kenny & Cook, 1999) “to examine how change over time is coordinated across the two individuals” (Kashy, Donnellan, Burt, & McGue, 2008, p. 317). In these models, person observations at a given time point were treated as level-one units and couples were treated as level-two units. We refrained from employing an alternative three-level hierarchical approach (i.e. observations at a given time point nested in persons nested in dyads) for two main reasons. First, because, in our dataset, couple members were commonly assessed at the same occasion. Consequently, the level of time points is cross-qualified with the person level (Garcia & Kenny, 2018). Second, in the current study, there would be no probabilistic variability at the person level (Laurenceau & Bolger, 2005), because we assign each dyad member to one of two fixed roles (i.e. to-be-deceased partner and to-be-bereaved partner). Table 2 provides a randomly created example of a couple data set from the event sample that illustrates the nested structure of the current data.

To capture the coordinated trajectories of life satisfaction, we used the MIXED procedure in SAS (Littell, Milliken, Stroup, Wolfinger, & Schabenberger, 2006) and the underlying missing-at-random assumptions. The analysis code is available on OSF (https://osf.io/yeh7v/?view_only=9cbf09b07ef34639b0745fe1a53c9d49). To address our research questions, we conducted two sets of analyses.

Multilevel dyadic growth models. In a first set of analyses, we modeled the dyadic trajectories of life satisfaction as a function of time (i.e. years-to-event). We estimated intercept parameters, linear slopes, and quadratic slopes for couple members in both samples. The quadratic change parameter was included to capture potential accelerations in the decline in life satisfaction that have been observed in previous studies of to-be-bereaved and to-be-deceased individuals (e.g. Anusic, Yap, & Lucas, 2014; Gerstorf et al., 2010). Note that we also estimated alternative linear models of time in both samples and compared them against the quadratic models. We then proceeded with the model that provided a better relative fit (i.e. a lower Akaike information criterion).

We controlled for disability status as a time-variant indicator of health to ensure that the observable event-related changes in life satisfaction can be interpreted above and beyond the effects of a changing health status³.

The following equation describes the dyadic growth of life satisfaction in couple members approaching [partner] death:

(1.1)

$$\begin{aligned}
 LS_{jk} = & \beta_{D-0j}(To-Be-Deceased_{jk}) + \beta_{B-0j}(To-Be-Bereaved_{jk}) \\
 & + \beta_{D-1j}(To-Be-Deceased_{jk} * Years-to-Event_{jk}) + \beta_{B-1j}(To-Be-Bereaved_{jk} * Years-to-Event_{jk}) \\
 & + \beta_{D-2j}(To-Be-Deceased_{jk} * Years-to-Event_{jk}^2) + \beta_{B-2j}(To-Be-Bereaved_{jk} * Years-to-Event_{jk}^2) \\
 & + \beta_{D-3j}(To-Be-Deceased_{jk} * Disability_{jk}) + \beta_{B-3j}(To-Be-Bereaved_{jk} * Disability_{jk}) + e_{D-jk} + e_{B-jk}
 \end{aligned}$$

where

Running head: LIFE SATISFACTION IN COUPLES PRECEDING [PARTNER]
DEATH

$$\beta_{D-0j} = \gamma_{D00} + u_{D0j} \quad \beta_{B-1j} = \gamma_{B10} + u_{B1j} \quad \beta_{D-3j} = \gamma_{D30}$$

$$\beta_{B-0j} = \gamma_{B00} + u_{B0j} \quad \beta_{D-2j} = \gamma_{D20} + u_{D2j} \quad \beta_{B-3j} = \gamma_{B30}$$

$$\beta_{D-1j} = \gamma_{D10} + u_{D1j} \quad \beta_{B-2j} = \gamma_{B20} + u_{B2j}$$

In our analyses, we followed a dual-intercept approach to estimate both partners' trajectories of life satisfaction in a combined model. That is, we included two dummy-coded variables which indicated whether an observation belonged to the to-be-deceased partner or to the to-be-bereaved partner (see Table 2). This allowed us to obtain separate intercept, linear slope, and quadratic slope estimates for partners approaching death and partners approaching bereavement (Kashy & Donnellan, 2008, for details see code). The index D describes estimates for to-be-deceased partners, while the index B describes estimates for to-be-bereaved partners. According to this model, levels of life satisfaction of a to-be-deceased or a to-be-bereaved partner in couple j at a given time point k can be partitioned into their estimated level of life satisfaction in the year before [partner] death (i.e. β_{D-0j} , β_{B-0j}), their estimated linear (i.e. β_{D-1j} , β_{B-1j}) and quadratic changes (i.e. β_{D-2j} , β_{B-2j}) in life satisfaction approaching the year of [partner] death, the time-lagged effect of disability status (i.e. β_{D-3j} , β_{B-3j}), and a time-specific error term (i.e. e_{D-jk} , e_{B-jk}). This error term represents deviations of observed levels of life satisfaction from levels of life satisfaction predicted for the to-be-deceased or the to-be-bereaved partner in couple j at the given time point k .

We allowed for random between-couple variation in the parameters of the dyadic growth model. Consequently, the estimated intercepts, linear slopes, and quadratic slopes of a to-be-deceased and a to-be-bereaved partner can further be broken down into their respective fixed effect; that is, the average sample-level intercept (i.e. γ_{D00} , γ_{B00}), linear slope (i.e. γ_{D10} , γ_{B10}), and quadratic slope (i.e. γ_{D20} , γ_{B20}) and a partner-specific deviation from these sample-level fixed effects. Deviations of partner-specific estimates from the average sample-level intercept are represented by the parameters u_{D0j} and u_{B0j} , while the parameters u_{D1j} , u_{B1j} and

u_{D2j} , u_{B2j} represent deviations of partner-specific estimates from average sample-level linear and quadratic slopes.

Following recommendations by Kashy and Donnellan (2008), we also tested for between-partner differences in the estimated growth parameters. To that end, we included the variable partner role as an interaction term and reformulated the model in the following way:

(1.2)

$$\begin{aligned}
 LS_{jk} = & \beta_{0j} + \beta_{1j}(Years\text{-}to\text{-}Event_{jk}) + \beta_{2j}(Years\text{-}to\text{-}Event_{jk}^2) + \beta_{3j}(Disability_{jk}) \\
 & + \beta_{4j}(Partner\ Role_{jk}) + \beta_{5j}(Partner\ Role_{jk} * Years\text{-}to\text{-}Event_{jk}) \\
 & + \beta_{6j}(Partner\ Role_{jk} * Years\text{-}to\text{-}Event_{jk}^2) + \beta_{7j}(Partner\ Role_{jk} * Disability_{jk}) + e_{D-jk} + e_{B-jk}
 \end{aligned}$$

where

$$\begin{aligned}
 \beta_{0j} &= \gamma_{00} + u_{0j} & \beta_{3j} &= \gamma_{30} & \beta_{6j} &= \gamma_{60} \\
 \beta_{1j} &= \gamma_{10} + u_{1j} & \beta_{4j} &= \gamma_{40} & \beta_{7j} &= \gamma_{70} \\
 \beta_{2j} &= \gamma_{20} + u_{2j} & \beta_{5j} &= \gamma_{50}
 \end{aligned}$$

This interaction approach provided us with only one intercept (i.e. β_{0j}), linear slope (i.e. β_{1j}) and quadratic slope (i.e. β_{2j}) estimate as well as one estimate for the effect of disability status (i.e. β_{3j}) for both couple members. Between-partner differences in these growth parameters were qualified as additional interaction effects (i.e. β_{4j} , β_{5j} , β_{6j} and β_{7j}).

Note that if partners did not significantly differ in their estimated growth parameters, we report only one effect for both partners (obtained from the interaction model). If there was a significant interaction effect, we report separate estimates for both partners (obtained from the dual-intercept model).

Longitudinal actor-partner interdependence approach. In a second set of analyses, we moved beyond the description of dyadic changes in life satisfaction in the years preceding [partner] death and additionally examined the interpersonal pathways of well-being transmission in this phase of life.

To that end, we expanded the models described in Equation 1.1 and 1.2 by adding the time-lagged actor and partner effects of both partners' levels of life satisfaction into the model. This allowed us to test the interpersonal effects (i.e. partner effects or transmission effects) that both couple members exerted on each other's life satisfaction at a later time point, while accounting for intrapersonal stability effects (i.e. actor effects).

In these models, we also controlled for the time-lagged effect of disability status. As an extension, the effect of disability status was not only included as an intrapersonal but also as an interpersonal control variable. This way, the observable transmission effects of life satisfaction between partners can be interpreted above and beyond the effect of one partner's health status on the other partner's life satisfaction³. The extended multilevel dyadic growth model that incorporates a longitudinal actor-partner interdependence approach to predict life satisfaction in couple members approaching [partner] death is presented in Equation 2.1:

(2.1)

$$\begin{aligned}
LS_{jk} = & \beta_{D-0j}(To-Be-Deceased_{jk}) + \beta_{B-0j}(To-Be-Bereaved_{jk}) \\
& + \beta_{D-1j}(To-Be-Deceased_{jk} * Years-to-Event_{jk}) + \beta_{B-1j}(To-Be-Bereaved_{jk} * Years-to-Event_{jk}) \\
& + \beta_{D-2j}(To-Be-Deceased_{jk} * Years-to-Event_{jk}^2) + \beta_{B-2j}(To-Be-Bereaved_{jk} * Years-to-Event_{jk}^2) \\
& + \beta_{A\_D-3j}(To-Be-Deceased_{jk} * Disability_{jk}) + \beta_{A\_B-3j}(To-Be-Bereaved_{jk} * Disability_{jk}) \\
& + \beta_{P\_D-3j}(To-Be-Deceased_{jk} * Partner Disability_{jk}) \\
& + \beta_{P\_B-3j}(To-Be-Bereaved_{jk} * Partner Disability_{jk}) \\
& + \beta_{A\_D-4j} (To-Be-Deceased_{jk} * LS_{jk}) + \beta_{A\_B-4j} (To-Be-Bereaved_{jk} * LS_{jk}) \\
& + \beta_{P\_D-4j} (To-Be-Deceased_{jk} * Partner LS_{jk}) \\
& + \beta_{P\_B-4j} (To-Be-Bereaved_{jk} * Partner LS_{jk}) + e_{D-jk} + e_{B-jk}
\end{aligned}$$

where

$$\begin{aligned}
\beta_{D-0j} &= \gamma_{D00} + u_{D0j} & \beta_{B-1j} &= \gamma_{B10} + u_{B1j} & \beta_{A\_D-3j} &= \gamma_{A\_D30} \\
\beta_{B-0j} &= \gamma_{B00} + u_{B0j} & \beta_{D-2j} &= \gamma_{D20} + u_{D2j} & \beta_{A\_B-3j} &= \gamma_{A\_B30} \\
\beta_{D-1j} &= \gamma_{D10} + u_{D1j} & \beta_{B-2j} &= \gamma_{B20} + u_{B2j} & \beta_{P\_D-3j} &= \gamma_{P\_D30}
\end{aligned}$$

$$\beta_{P\_B-3j} = \gamma_{P\_B30}$$

$$\beta_{A\_B-4j} = \gamma_{A\_B40}$$

$$\beta_{P\_B-4j} = \gamma_{P\_B40}$$

$$\beta_{A\_D-4j} = \gamma_{A\_D40}$$

$$\beta_{P\_D-4j} = \gamma_{P\_D40}$$

Again, we ran a dual-intercept model to capture the effects of time as well as the actor and partner effects of to-be-deceased and to-be-bereaved partners in a combined model. According to Equation 2.1 and parallel to the model described in Equation 1.1, levels of life satisfaction of a to-be-deceased or a to-be-bereaved partner in couple j at a given time point k can be predicted by a partner-specific intercept (i.e. $\beta_{D-0j}, \beta_{B-0j}$) as well as a linear (i.e. $\beta_{D-1j}, \beta_{B-1j}$) and a quadratic effect (i.e. $\beta_{D-2j}, \beta_{B-2j}$) of time-to-event. Further to the first set of analyses, the life satisfaction of a to-be-deceased or a to-be-bereaved partner is also predicted by a time-lagged intrapersonal effect of this person's disability status (i.e. $\beta_{A\_D-3j}, \beta_{A\_B-3j}$) and life satisfaction (i.e. $\beta_{A\_D-4j}, \beta_{A\_B-4j}$), representing the longitudinal actor effects of disability status and life satisfaction, as well as by the time-lagged interpersonal effects of disability status (i.e. $\beta_{P\_D-3j}, \beta_{P\_B-3j}$) and life satisfaction (i.e. $\beta_{P\_D-4j}, \beta_{P\_B-4j}$) originating from the corresponding partner (i.e. longitudinal partner effects of disability status and life satisfaction).

In these analyses, actor and partner life satisfaction were entered as person-mean centered predictor variables to facilitate the interpretability of the obtained intercept parameters across the different models. For the person-mean centering and to be consistent with the first set of analyses, we relied on T-units (based on life satisfaction scores of the entire SOEP 2002). That is, we created two new variables, in which we subtracted the average T-score of life satisfaction per person from their observed level of life satisfaction (in T-units) in a given survey year. Finally, the error term (i.e. e_{D-jk}, e_{B-jk}) represents deviations of observed levels of life satisfaction from levels of life satisfaction predicted for the to-be-deceased or to-be-bereaved partner in couple j at the given time point k .

Note that the time lag was specified as a lag of one, so levels of life satisfaction at time point k were longitudinally predicted by both partners' disability status and their reported

levels of life satisfaction in their last survey participation ($k-1$). For the dyadic variables (i.e. disability status and life satisfaction), we introduced the suffixes A and P into the terms of the equation to distinguish actor effects that unfold on an intrapersonal level and partner effects that act on an interpersonal scale. As in the first set of analyses, we allowed for between-couple variation in the estimated growth parameters⁴ and tested for significant between-partner differences in the fixed effects by including the variable partner role as an interaction term (Kashy & Donnellan, 2008). Equation 2.2 illustrated the interaction model:

(2.2)

$$\begin{aligned}
 LS_{jk} = & \beta_{0j} + \beta_{1j}(Years\text{-}to\text{-}Event_{jk}) + \beta_{2j}(Years\text{-}to\text{-}Event_{jk}^2) \\
 & + \beta_{A\_3j}(Disability_{jk}) + \beta_{P\_3j}(Partner\ Disability_{jk}) + \beta_{A\_4j}(LS) + \beta_{P\_4j}(Partner\ LS_{jk}) \\
 & + \beta_{5j}(Partner\ Role_{jk}) + \beta_{6j}(Partner\ Role_{jk} * Years\text{-}to\text{-}Event_{jk}) \\
 & + \beta_{7j}(Partner\ Role_{jk} * Years\text{-}to\text{-}Event_{jk}^2) + \beta_{A\_8j}(Partner\ Role_{jk} * Disability_{jk}) \\
 & + \beta_{P\_8j}(Partner\ Role_{jk} * Partner\ Disability_{jk}) + \beta_{A\_9j}(Partner\ Role_{jk} * LS_{jk}) \\
 & + \beta_{P\_9j}(Partner\ Role_{jk} * Partner\ LS_{jk}) + e_{D-jk} + e_{B-jk}
 \end{aligned}$$

where

$$\begin{array}{lll}
 \beta_{0j} = \gamma_{00} + u_{0j} & \beta_{A\_4j} = \gamma_{A\_40} & \beta_{A\_8j} = \gamma_{A\_80} \\
 \beta_{1j} = \gamma_{10} + u_{1j} & \beta_{P\_4j} = \gamma_{P\_40} & \beta_{P\_8j} = \gamma_{P\_80} \\
 \beta_{2j} = \gamma_{20} + u_{2j} & \beta_{5j} = \gamma_{50} & \beta_{A\_9j} = \gamma_{A\_90} \\
 \beta_{A\_3j} = \gamma_{A\_30} & \beta_{6j} = \gamma_{60} & \beta_{P\_9j} = \gamma_{P\_90} \\
 \beta_{P\_3j} = \gamma_{P\_30} & \beta_{7j} = \gamma_{70} &
 \end{array}$$

For the control sample, we specified the same set of models and followed the same analytic procedure to be able to compare event-related changes and patterns of interdependence in life satisfaction with couples that were not approaching death or bereavement. In this group, the trajectories and transmission effects of life satisfaction were modeled for all years that a couple participated. Because partners in the control sample could not be distinguished based on their role in the experience of impending [partner] death, we

randomly assigned members of a dyad to be partner A or partner B. In doing so, we ensured that men and women were allocated to the partner A and partner B groups in the same proportions as the to-be-deceased and the to-be-bereaved groups (partner A: 72% male, partner B: 28% male). We also ran an alternative set of models in which we distinguished between male and female partners and these models yielded very similar results (see Supplemental Table 1 and 2). However, we considered it important that the conclusions derived from the control group were not confounded by gender, which is why we report findings based on the gender-balanced random assignment of partner role.

Results

We present the results separately for the event sample and the control sample. For each sample, we start with the simpler multilevel dyadic growth models and compare the relative model fit of a linear model of time against a model including an additional quadratic effect of time. Having identified the more suitable model of time for our data, we present findings on both partners' trajectories of life satisfaction as well as between-partner correlations in the estimated growth parameters and residuals. Afterwards, we report the results of the extended multilevel models that incorporate a longitudinal actor-partner interdependence approach. These models reveal the dyadic pathways of well-being transmission in the years before [partner] death or last survey participation. In a final step, we summarize and compare the findings derived from the event sample and the control sample.

Event Sample

Multilevel dyadic growth models. Comparing the Akaike information criterion (AIC) of the model including the quadratic effect of time ($AIC_{\text{Quadratic}} = 214,661$) against the simpler linear model of time ($AIC_{\text{Linear}} = 215,242$) revealed that the quadratic model yields a better relative fit. Consequently, a model allowing for non-linear declines in life satisfaction fit the developmental trajectories of couple members approaching [partner] death better than a model that assumed steadily deteriorating life satisfaction in the years leading up to [partner]

death.

Dyadic trajectories of life satisfaction. The results obtained from the dyadic multilevel model including a quadratic effect of time are shown in Table 3.

In to-be-bereaved and to-be-deceased partners, we observed significant negative effects of time for the linear and the quadratic slopes, suggesting that both partners experienced significant declines in life satisfaction in the years before [partner] death and that these declines were characterized by a significant degree of acceleration. The significant negative interaction effects of partner role signify that linear and quadratic declines were more pronounced in to-be-deceased couple members compared to their to-be-bereaved partners. Across the final ten years before [partner] death, the estimated declines in life satisfaction amounted to a drop of 6.5 T-units in to-be-deceased partners and of 3.7 T-units in to-be-bereaved partners. Finally, these differential rates of change between couple members also resulted in significant differences in their estimated levels of life satisfaction in the year prior to [partner] death. Couple members facing the year of their own death had estimated levels of life satisfaction that were around 0.45 standard deviations below the observed mean level of life satisfaction in the entire SOEP sample of 2002. In to-be-bereaved couple members, pre-event levels were only around 0.14 standard deviations below the SOEP reference sample of 2002. The analyses were controlled for disability status, which revealed a significant negative effect on life satisfaction that did not differ in strength between partners.

The average partner-specific trajectories of life satisfaction in couples approaching [partner] death are illustrated in Figure 1. It should be noted that we observed significant inter-individual variability in the estimated growth parameters of to-be-deceased and to-be-bereaved partners.

Between-partner correlation in the dyadic growth parameters. Intercept correlations as well as linear and quadratic slope correlations were high between partners

($r_{DB\_Intercept} = .71$, $r_{DB\_Linear\ Slope} = .68$, $r_{DB\_Quadratic\ Slope} = .67$), indicating a strong degree of

interdependence in the trajectories of life satisfaction in to-be-deceased and to-be-bereaved couple members in the years approaching [partner] death. The residual correlation between partners was moderate ($r_{DB\_Residuals} = .39$), suggesting that couples in the event sample are exposed to shared environmental influences that affect both partners' life satisfaction above and beyond their disability status and their proximity to [partner] death.

Longitudinal actor-partner interdependence approach. The results of the incorporated longitudinal actor-partner interdependence approach for the event sample are presented in Table 4.

In line with the simpler multilevel dyadic growth models, we observed significant linear and quadratic declines in life satisfaction, which were more pronounced in to-be-deceased partners as compared to their to-be-bereaved counterparts. The estimated intercept parameters also differed between couple members, with lower estimates among to-be-deceased partners. Note that due to the person-mean centering and the coding of the predictor variables, the intercepts must be interpreted as the estimated pre-event level of life satisfaction among to-be-deceased and to-be-bereaved couple members who had reported an average level of life satisfaction in the previous survey year (with reference to their personal average); whose partner had also reported an average level of life satisfaction in the previous survey year (with reference to their personal average); and who had neither reported a disability themselves nor had a partner who had reported a disability in the previous year.

We did not identify a significant time-lagged actor effect of life satisfaction in couples approaching [partner] death. That is, deviations from average levels of life satisfaction in one survey year were not associated with levels of life satisfaction that were reported in the following survey year. We did, however, observe a significant time-lagged partner effect of life satisfaction; the strength of this partner effect did not differ between to-be-deceased and to-be-bereaved partners. That is, in years when couple members reported higher levels of life satisfaction (i.e. higher with reference to their personal average), their partners also reported

higher levels of life satisfaction in the following survey year. These effects were robust against the inclusion of disability status as a time-lagged control variable. We found that disability status had a negative actor effect and, surprisingly, a positive partner effect on later life satisfaction. These effects did not differ in strength between partners.

To sum up, in couples approaching [partner] death, we observed higher levels of life satisfaction on occasions when couple members were further away from the year of [partner] death; when their partners had reported higher (than personal average) levels of life satisfaction in the previous survey year; and when, in the previous survey year, they had not reported a disability but such a report was made by their partner.

Control Sample

Multilevel dyadic growth models. Comparing the linear model of time ($AIC_{\text{Linear}} = 193,388$) against the model including a quadratic effect of time ($AIC_{\text{Quadratic}} = 193,025$) revealed that the quadratic model produced a better relative fit. As with the event sample, we therefore present findings derived from the quadratic model of time.

Dyadic trajectories of life satisfaction. The results of the dyadic multilevel model for the control sample are presented in Table 5.

Parallel to the event sample, we observed significant negative effects of time for the linear and the quadratic slope. In contrast to the event sample, however, these effects did not significantly differ between partners as indicated by non-significant interaction effects of partner role. Consequently, we report only one parameter for both partners. The estimated overall 10-year drop in life satisfaction amounts to a difference of 2 T-units. In the control sample, the final estimated level of life satisfaction was 0.1 standard deviations above the observed mean level of life satisfaction in the entire SOEP sample of 2002. The analyses were controlled for disability status, which had a significant negative effect on life satisfaction that did not differ in strength between partners.

The trajectories of life satisfaction in couples approaching the year of last survey participation are also illustrated in Figure 1. Similarly to the event sample, we observed significant inter-individual variability within the estimated intra-individual growth parameters of both couple members.

Between-partner correlation in the dyadic growth parameters. Intercept and slope correlations were high between couple members who did not experience [partner] death. Between-partner correlations ranged from $r_{AB\_Intercept} = .72$ for the intercept, over $r_{AB\_LinearSlope} = .78$ for the linear slope to $r_{AB\_QuadraticSlope} = .85$ for the quadratic slope. As in the event sample, residual correlations between partners were moderate ($r_{AB\_Residuals} = .34$), indicating a considerable effect of shared environmental influences that were not accounted for by our models.

Longitudinal actor-partner interdependence approach. The results of the incorporated longitudinal actor-partner interdependence approach for the control sample are presented in Table 6.

In line with the simpler multilevel dyadic growth models, we observed significant linear and quadratic declines in life satisfaction. These declines as well as the estimated intercept parameters did not differ between partners.

As in the event sample, we did not identify a significant time-lagged actor effect of life satisfaction in control couples. That is, deviations from average levels of life satisfaction in one survey year were not predictive of levels of life satisfaction that were reported in a subsequent survey year. We did, however, observe a significant time-lagged partner effect of life satisfaction and—similarly to the event sample—this partner effect did not differ in strength between couple members. Put differently, in years when couple members reported higher levels of life satisfaction (i.e. higher with reference to their personal average), their partners reported higher levels of life satisfaction in the following survey year. These effects were robust against the inclusion of disability status as a control variable, which had a

negative time-lagged actor effect but no partner effect on life satisfaction. The strength of the actor effect of disability status did not vary between partners.

To sum up, in couples approaching the year of last survey participation, we observed higher levels of life satisfaction on occasions when couple members were further away from their last survey participation, when their partners had reported higher (than personal average) levels of life satisfaction in the previous survey year, and when they had not reported a disability in the previous survey year.

Comparison of the event and control sample

With regard to the trajectories of life satisfaction, the confidence intervals for the estimated linear slopes (95% CI $\gamma_{D10} = [-1.12, -0.89]$, 95% CI $\gamma_{B10} = [-0.68, -0.49]$), quadratic slopes (95% CI $\gamma_{D20} = [-0.042, -0.030]$, 95% CI $\gamma_{B20} = [-0.027, -0.017]$), and intercept parameters (95% CI $\gamma_{D00} = [44.89, 46.10]$, 95% CI $\gamma_{B00} = [48.11, 49.13]$) of couple members in the event sample did not overlap with the estimated growth parameters of couples in the control sample (95% CI $\gamma_{AB10} = [-0.39, -0.24]$, 95% CI $\gamma_{AB20} = [-0.016, -0.007]$, 95% CI $\gamma_{AB00} = [50.59, 51.37]$). This suggests that control couples, when compared to couple members approaching [partner] death, experienced flatter and less accelerated declines that resulted in higher final levels of life satisfaction.

In terms of between-partner correlations, a normal approximation procedure was used to calculate the confidence intervals for the Fisher's z-transformed correlations coefficients (Irimata & Li, 2018)⁵. We found that between-partner correlations of the intercept (95% CI $r_{DB\_Intercept} = [0.84, 0.94]$, 95% CI $r_{AB\_Intercept} = [0.86, 0.96]$) did not differ between event and control couples. We did, however, observe significant differences for the between-partner correlations of the linear slope (95% CI $r_{DB\_Linear\ Slope} = [0.78, 0.88]$, 95% CI $r_{AB\_Linear\ Slope} = [0.99, 1.10]$) and the quadratic slope (95% CI $r_{DB\_Quadratic\ Slope} = [0.60, 0.70]$, 95% CI $r_{AB\_Quadratic\ Slope} = [1.00, 1.10]$). The residual correlations between partners did not significantly differ between the samples (95% CI $r_{DB\_Residuals} = [0.36, 0.46]$,

95% $CI_{r_{AB\_Residuals}} = [0.30, 0.41]$). Consequently, linear and quadratic changes in life satisfaction were more strongly linked between partners in the control sample as compared to couples approaching [partner] death, while pre-event level correlations of life satisfaction and residual correlations (i.e. the effect of shared environmental influences that were not accounted for by our models) were comparable between event and control couples.

Finally, and regarding the transmission effects of life satisfaction between partners, we did not observe significant differences between couple members approaching [partner] death (95% $CI_{\gamma_{P\_DB40}} = [0.02, 0.04]$) and couple members in the control sample (95% $CI_{\gamma_{P\_AB40}} = [0.03, 0.05]$). That is, the strength of the time-lagged effect that both partners had on each other's levels of life satisfaction was comparable between event and control couples.

Discussion

Until the end of life, individual development unfolds within contexts (Baltes, 1987; Bronfenbrenner, 1979) and these contexts shape personal experiences and behavior through transactional processes (Magnusson, 1990). Considering that romantic relationships are among the closest and most meaningful social contexts humans experience during adulthood, the developmental unit of the couple should be particularly informative when studying inter-individual differences in life satisfaction across the lifespan. In the current study, we focused on the lifespan of a romantic relationship and zoomed into the last years of life shared by couple members approaching the death of one partner. In doing so, we integrated research perspectives on terminal well-being decline and partner bereavement and took a codevelopmental approach to the examination of life satisfaction in the experience of impending [partner] death.

Changes in Life Satisfaction in the Context of Impending [Partner] Death

Our findings are in line with our expectations and with the results of previous studies that investigated changes in life satisfaction in the context of impending [partner] death from

separate individual-level perspectives (Anusic et al., 2014; Gerstorf, Ram, Estabrook, et al., 2008; Gerstorf et al., 2010; Gerstorf, Ram, Röcke, et al., 2008; Infurna et al., 2016; Mroczek & Spiro III, 2005; Yap et al., 2012): To-be-deceased and to-be-bereaved individuals experienced significant declines in life satisfaction as they approached the year of death or partner loss, respectively, and these declines were characterized by some degree of acceleration. This implies that for many couples, [partner] death was foreshadowed by a phase of mortality- and loss-related challenges that outweighed both partners' regulatory capacities.

But are these trajectories of life satisfaction really characteristic of couple members approaching [partner] death or can they also be observed in couples who find themselves in a different phase of life?

We found that couple members in both samples experienced accelerating declines in life satisfaction across the observation period. Yet, in partners who were neither approaching their own nor their partner's death, these declines were less pronounced, as indicated by flatter slopes and higher final levels of life satisfaction. In fact, we observed long-lasting level differences in life satisfaction between couples in the event and control samples that were exacerbated in the years immediately preceding [partner] death. These findings suggest that romantic partners who approached the death of one couple member, and those who found themselves in a different stage of their romantic lifespan (control sample), experienced comparable patterns of well-being decline, but these patterns unfolded with an added intensity among to-be-bereaved and to-be-deceased partners. Considering, however, that couple members in the control sample were also going to experience death or the death of the partner at some point (unless they separated before this event), we suggest that their mild declines in life satisfaction might be representative of an earlier stage of the developmental pathway toward [partner] death.

Our findings once again challenge the well-being paradox of old age (Brandtstädter & Greve, 1994; Kunzmann et al., 2000) and the premises of socio-emotional selectivity theory (Carstensen et al., 2003), suggesting that those emotion regulation strategies that were found to be emphasized by older adults (e.g. the selective prioritization of positive information and emotionally close interaction partners) might be insufficient or less effective to manage the health-related and social losses in this late phase of life. Hence, we conclude that the present results highlight the utility of investigating the dyadic trajectories of life satisfaction in different developmental contexts. This line of research might lead to a deeper understanding of the limits and contextual boundaries of age-related proficiencies in emotion regulation (Kunzmann & Isaacowitz, 2017) and it might help us to identify the critical time frames of terminal well-being decline in the shared relationship context of impending [partner] death.

Couple interdependencies in the context of impending [partner] death

Previous research suggests that subjective well-being is interdependent and develops in similar ways within couple members (Hoppmann et al., 2011; Orth et al., 2018; Schimmack & Lucas, 2010). So far, however, no study has addressed the question of how these co-dynamics evolve in an end-of-life context and whether they persist until the death of one partner.

We found that the developmental trajectories of life satisfaction are highly intertwined in couples approaching [partner] death, as indicated by strong between-partner correlations for the intercept, the linear slope, and the quadratic slope, which ranged from $r = .67$ to $r = .71$. Taking a closer look at the pathways of well-being transmission, we further identified significant longitudinal partner effects between couple members approaching [partner] death: On average, to-be-deceased and to-be-bereaved individuals showed higher levels of life satisfaction if their partners also reported higher (than personal average) levels of life satisfaction at an earlier time point. Interestingly, we did not identify significant differences in the strength of the transmission effects of life satisfaction between couple members. This

suggests that the contagion of life satisfaction between partners is not dominated by the to-be-deceased or the to-be-bereaved partner. This finding is noteworthy, considering asymmetrical patterns of support and care provision associated with an end-of-life relationship context (McLean & Jones, 2007). Moreover, the observed transmission effects of life satisfaction were robust against the inclusion of both partners' disability status, which leads to the conclusion that the transmission of life satisfaction goes beyond a changing state of health in the partner³. In fact, we observed that disability status had a positive partner effect on later levels of life satisfaction in the event sample but not in the control sample. This finding requires further replication but it might point to a buffering effect of acquiring a legal disability status and of receiving official benefits from the health care system (e.g. nursing services). Such benefits and forms of support might be experienced as particularly relieving.

In the control sample, we also observed strong patterns of interdependence and significant transmission effects of life satisfaction between partners. On a general level, these findings are in line with previous evidence on couple interdependencies in subjective well-being and they emphasize that life satisfaction does not become "a private affair" (Gustavson et al., 2016, p. 1306) in an end-of-life context. Instead, personal well-being appears to remain susceptible to the well-being states of the partner. Hence, couple interdependence in subjective well-being may be understood as an interpersonal phenomenon that is not restricted to certain stages of the romantic lifespan.

We went a step further and hypothesized that couple members approaching the death of one partner would be more susceptible to their partner's life satisfaction and that they would reveal stronger patterns of interdependence in their trajectories of life satisfaction than couples who were not approaching death or partner bereavement. The present study does not provide support for this hypothesis. On the contrary, we identified stronger between-partner correlations in the declines of life satisfaction among couple members in the control sample, suggesting that their changes in life satisfaction were more attuned when compared to those of

couple members approaching [partner] death. On a related note, we observed that the trajectories of life satisfaction differed between partners in the event but not the control sample. That is, life satisfaction deteriorated more intensely in partners preceding their own death when compared to partners approaching bereavement, eventually resulting in a growing disparity between to-be-bereaved and to-be-deceased partners in the years leading up to [partner] death. This is in line with findings of an earlier study that relied on a within-couple approach and observed slightly increasing dissimilarities in life satisfaction within couple members across time (Schade, Hülür, Infurna, Hoppmann, & Gerstorf, 2016). How can these findings be explained, taking into account theoretical approaches to couple similarities in well-being as well as the unique context of impending [partner] death?

We suggested earlier that interdependencies in life satisfaction in couples may result from interpersonal processes of mutual well-being transmission as well as shared environmental influences that impact both partners' well-being in similar ways (Orth et al., 2018). Our results do not imply that the changes in life satisfaction in to-be-deceased and to-be-bereaved partners were less attuned because couple members became increasingly immune to the well-being states of their partner. In both samples, couple members longitudinally affected each other's levels of well-being and the strength of these transmission effects did not differ between event and control couples. In fact, additional exploratory analyses provided further support for this conclusion in showing that the between-partner transmission effects of life satisfaction did not change across time (i.e. distance-to-event did not emerge as a significant moderator of partner effects⁶). Moreover, the effect of shared environmental influences that were not accounted for by our models (i.e. between-partner residual correlations) was also comparable between couples approaching [partner] death and those approaching their last survey participation. Consequently, weaker attunements of life satisfaction among couple members in the event sample neither resulted from a declining well-being permeability between partners nor did they reflect a diminishing importance of

shared environmental influences. We see three alternative explanations for weaker between-partner correlations in the estimated slopes and a growing disparity in the trajectories of life satisfaction in couples approaching partner death.

First and foremost, our findings suggest that the sources for less attuned trajectories of life satisfaction in the context of impending [partner] death are rooted in the unique, *unshared* individual-level experiences associated with the experience of impending death and partner bereavement. In fact, it appears that mortality-related deficiencies in physical, cognitive, emotional, and social functioning as well as existential issues related to the terminal stage of life are more challenging to the adaptive capacities of an individual than are the experiences of distress, insecurity, and caregiving of to-be-bereaved partners.

Second, the observed disparity may also be caused by the relationship-focused coping strategy of protective buffering (Coyne & Smith, 1991; Thompson & Bolger, 1999). It is possible that to-be-bereaved partners actively downregulated their own worries and distress so as to remain supportive and to reduce the burdens on their dying partner. Although this was not mirrored in a declining strength of well-being transmission from to-be-bereaved to to-be-deceased partners, such intrapersonal regulatory efforts might explain why to-be-bereaved partners maintained higher levels of life satisfaction in the years before partner death.

A final explanation is methodological in nature: We only included survey years in which both partners were still alive and we excluded life satisfaction observations that were obtained after the death of one partner. Considering that the low point of subjective well-being is generally expected to be achieved in the actual year of bereavement (Anusic & Lucas, 2014; Anusic et al., 2014; Yap et al., 2012), we may have underestimated the strength of the experienced linear and non-linear declines in to-be-bereaved individuals. Nevertheless, our primary interest was to examine *anticipatory* changes in life satisfaction in the *shared* experience of approaching [partner] death. Findings derived from our current method suggest that the harmful consequences of bereavement are foreshadowed in the years before partner

death, but they may unfold to their fullest potential only after the actual event of loss—when widows and widowers are adapting to a life without their partner.

In sum, life satisfaction seems to be highly intertwined and it remains contagious between partners in good times and in bad, until death parts the couple. Yet, couples approaching [partner] death experience a widening gap in their levels of life satisfaction and their changes in life satisfaction are less attuned when compared to a sample of couples that are not facing the death of one partner. The sources for weaker couple attunements of life satisfaction in the context of impending [partner] death appear to be rooted in the unique individual-level challenges faced by both partners, and they do not seem to result from an increasing immunity to the well-being states of the partner or from a diminishing role of shared environmental influences.

Limitations and Future Directions

The present study is the first to take a couple-level approach to investigate changes and interdependencies in life satisfaction in an end-of-life context. In doing so, we integrated previous research perspectives on partner bereavement and terminal well-being decline and acknowledged the interdependent nature of life satisfaction in the shared experience of impending [partner] death. Nevertheless, the current findings should be interpreted in view of some limitations that may be addressed in future research.

First, we focused on couples in which both partners reported on their life satisfaction in at least the three years before the death of one partner. Although the excluded sample of couples did not significantly differ from the final analysis sample with regard to their baseline levels of life satisfaction, their age, education, disability status, and employment status, it is still possible that they experienced more pronounced declines in health and well-being later on. That is, to-be-deceased partners who were still able to take part in the SOEP interview in the years before death may have been particularly healthy when compared to the general population. Consequently, both partners' pre-event declines may have been underestimated.

Yet, this restriction was necessary to accurately estimate codevelopments of life satisfaction in the last years before [partner] death, especially since these years have been revealed as critical with regard to well-being decline (Gerstorf, Ram, Estabrook, et al., 2008; Gerstorf et al., 2010; Gerstorf, Ram, Röcke, et al., 2008; Infurna et al., 2016).

Second, we relied on disability status as the sole time-variant control variable because it is the only indicator of health that was assessed throughout the entire study period (1984-2015). A legal classification of disability status may, however, imperfectly capture the complex health-related situation of couple members approaching [partner] death. We conducted a parallel set of analyses, in which we included both partners' functional limitations (i.e. difficulties with getting out of bed, shopping, and doing housework) as an additional indicator of health. These analyses are based on a shorter observation period—as the assessment of functional limitations was only introduced in 1985—but they yielded very similar results³ (for details see Supplemental Tables 3-6). These parallel findings further support the idea that the transmission of life satisfaction between partners is not merely accounted for by a changing state of partner health. Yet, the substantial between-couple variability in the estimated growth parameters suggests that our sample's experiences leading up to the year of [partner] death were diverse. In some couples, [partner] death may have been sudden and unexpected. In other cases, [partner] death may have been experienced as the end of a long illness. A broader consideration of other health indicators (i.e. medical conditions, cognitive functioning, need for care) and information on cause of death would have been highly useful in accounting for some of these unexplored differences—especially since a recent study found that unexpected death was associated with flatter proxy-reported terminal well-being declines (Gerlach et al., 2017). The SOEP has conducted EXIT interviews since 2009. In these interviews, participants who lost a close relative are asked about the last months of the deceased person's life and also about the cause of death. However, EXIT interviews were only available for a small group of deceased partners, which is why we chose

not to include this information in our analyses. As the SOEP continues, more EXIT interviews will be conducted and it will become increasingly feasible to combine lifetime and post-mortem proxy reports in the study of late-life well-being.

Future research may also investigate other intra- and interpersonal risk and protective factors for subjective well-being in the context of impending [partner] death. Amongst other factors, the timing of partner death within the “social clock” (Neugarten, 1979; Rook, Catalano, & Dooley, 1989), relationship quality (Carr et al., 2000), and afterlife beliefs (Carr & Sharp, 2013) have been explored but, so far, not through a dyadic lens that acknowledges their impact on both partners’ development. Also, and with regard to terminal decline research, recent studies have provided novel insights on the predictive power of personality traits (i.e. neuroticism, extraversion, and perceived control) for end-of-life well-being (Gerstorf et al., 2014; Mueller et al., 2018). Expanding on this research by examining the beneficial and harmful consequences of both partners’ personality characteristics in the shared experience of impending [partner] death may provide a deeper and more contextualized understanding of how the “power of personality” (Mueller et al., 2018; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007) unfolds at the end of life.

Third, we cannot entirely rule out the possibility that couple members of the control sample had already entered a phase of terminal or pre-bereavement decline. Findings from the control sample suggested that we may have captured an earlier phase of the developmental pathway toward [partner] death. One way of avoiding this would be to omit from analysis the couples’ last available years of observation. However, an undesirable consequence of this method would be systematic differences with regard to age and the amount of available observation points when compared to the event sample. We therefore decided not to follow this approach. Due to withdrawal or lack of information on mortality status, the same issue also applies to to-be-bereaved partners. In fact, previous research has documented an increased mortality rate among bereaved spouses (Moon, Kondo, Glymour, & Subramanian,

2011) and this widowhood effect was found to be foreshadowed in the years before partner death (Vable et al., 2015). By excluding dyads in which both partners died during the assessment phases, we sought to eliminate this possibility. Nevertheless, future studies may include couples in which both partners died and directly address mortality-related codevelopments through dyadic survival models.

Fourth, we note that the current findings are primarily based on couple members that have been married for a long time before experiencing the death of one partner. Taking into account the timing of [partner] death within the romantic lifespan could offer a deeper and more differential understanding regarding the patterns of codevelopment in the years preceding [partner] death.

Fifth, the current study took a first step in not only investigating the correlational interdependencies in the trajectories of life satisfaction in the years before [partner] death but also in exploring the pathways of well-being transmission in this phase of life. Yet, we could not test the mechanisms by which subjective well-being is shared between partners. What are the channels of well-being transmission in the context of impending [partner] death? And do they differ from between-partner processes that promote well-being transmission in another phase of the romantic lifespan? Dyadic measurement burst designs that combine longitudinal assessments on a larger time scale (i.e. years or months) with more proximal everyday-life measurements (e.g. ambulatory assessments) could provide answers to these questions. Such data would allow for scrutinizing the socio-emotional pathways through which subjective well-being becomes contagious between partners in different developmental contexts.

Nevertheless, assessing the everyday-life experiences, needs, and burdens of individuals who find themselves approaching the end of life, represents a major challenge (Gerstorf & Ram, 2015, p. 217). Innovative sensory assessment methods that are able to collect physiological, audio-visual, and geographical data without requiring effort of the participants could be a

promising—yet ethically challenging—venue for future research (Allemand & Mehl, 2017; Gerstorf & Ram, 2015; Wrzus & Mehl, 2015).

Sixth, we exclusively focused on the pre-event trajectories of life satisfaction. It may be an important direction for future research to investigate pre- and post-bereavement changes in life satisfaction in a unified framework and to test the impact of couple interdependencies in the years before loss on later adjustment to partner death. This could offer a deeper understanding of the impact the partners have on each other's development—even after their shared romantic lifespan.

Finally, we acknowledge that the impending death of a beloved person may not only challenge the well-being of their romantic partner but it may also have a negative impact on other members of their social network. According to nationally representative data from Germany, a fifth of the support and caregiving population aged between 40 and 85 years supports non-kin, while 80% provide support to relatives other than the partner (e.g. parents [in law], Klaus & Tesch-Römer, 2017). Considering the scope of informal support and embracing a contextualized as well as transactional understanding of development (Baltes, 1987; Bronfenbrenner, 1979; Magnusson, 1990), future research may explore end-of life developments within a broader social context.

Conclusion

“...for better, for worse, for richer, for poorer, in sickness and in health, until death do us part.” (Rite of Marriage, #25). The findings of the current study underpin expectations raised by this wedding-vow: The developmental trajectories of life satisfaction were highly intertwined between couple members until they were parted by death. Yet, when compared to couples that were not approaching the death of one partner, our findings suggest weaker between-partner attunements of life satisfaction in an end-of-life context. The sources for an increasing disparity in life satisfaction appear to be rooted in the unique individual-level experiences and challenges faced by to-be-deceased and to-be-bereaved partners rather than

in a declining susceptibility to the well-being states of the partner or a diminishing role of shared environmental influences. Future research should investigate the mechanisms underlying the pathways of well-being transmission in couples in an end-of-life context.

References

- Allemand, M., & Mehl, M. R. (2017). Personality assessment in daily life: A roadmap for future personality development research. In J. Specht (Ed.), *Personality Development Across the Lifespan* (pp. 437-454): Academic Press.
- Anusic, I., & Lucas, R. E. (2014). Do social relationships buffer the effects of widowhood? A prospective study of adaptation to the loss of a spouse. *Journal of Personality*, 82(5), 367-378. doi:10.1111/jopy.12067
- Anusic, I., Yap, S. C. Y., & Lucas, R. E. (2014). Does personality moderate reaction and adaptation to major life events? Analysis of life satisfaction and affect in an Australian national sample. *Journal of Research in Personality*, 51, 69-77. doi:10.1016/j.jrp.2014.04.009
- Baltes, P. (1987). Theoretical propositions of life-span developmental psychology: On the dynamics between growth and decline. *Developmental Psychology*, 23(5), 611-626.
- Baltes, P., & Nesselrode, J. (1979). History and rationale of longitudinal research. In P. Baltes & J. Nesselrode (Eds.), *Longitudinal research in the study of behavior and development* (pp. 1-39). San Diego, USA: Academic Press.
- Blanchflower, D. G., & Oswald, A. J. (2008). Is well-being U-shaped over the life cycle? *Social Science & Medicine*, 66(8), 1733-1749. doi:10.1016/j.socscimed.2008.01.030
- Bookwala, J., & Schulz, R. (1996). Spousal similarity in subjective well-being: The Cardiovascular Health Study. *Psychology and Aging*, 11(4), 582-590.
- Bourassa, K. J., Knowles, L. M., Sbarra, D. A., & O'Connor, M.-F. (2016). Absent but not gone: Interdependence in couples' quality of life persists after a partner's death. *Psychological Science*, 27(2), 270-281. doi:10.1177/0956797615618968
- Brandtstädter, J., & Greve, W. (1994). The aging self: Stabilizing and protective processes. *Developmental Review*, 14(1), 52-80. doi:10.1006/drev.1994.1003

- Bronfenbrenner, U. (1979). *The Ecology of Human Development: Experiments by Nature and Design*. Cambridge: Harvard University Press.
- Butler, E. A. (2015). Interpersonal affect dynamics: It takes two (and time) to tango. *Emotion Review*, 7(4), 336-341. doi:10.1177/1754073915590622
- Carr, D., House, J. S., Kessler, R. C., Nesse, R. M., Sonnega, J., & Wortman, C. (2000). Marital quality and psychological adjustment to widowhood among older adults: A longitudinal analysis. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 55(4), 197-207.
- Carr, D., & Sharp, S. (2013). Do afterlife beliefs affect psychological adjustment to late-life spousal loss? *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 69(1), 103-112. doi:10.1093/geronb/gbt063
- Carstensen, L. L., Fung, H. H., & Charles, S. T. (2003). Socioemotional selectivity theory and the regulation of emotion in the second half of life. *Motivation and Emotion*, 27(2), 103-123. doi:10.1023/a:1024569803230
- Carstensen, L. L., Turan, B., Scheibe, S., Ram, N., Ersner-Hershfield, H., Samanez-Larkin, G. R., . . . Nesselroade, J. R. (2011). Emotional experience improves with age: Evidence based on over 10 years of experience sampling. *Psychology and Aging*, 26(1), 21-33. doi:10.1037/a0021285
- Chochinov, H. M., Hassard, T., McClement, S., Hack, T., Kristjanson, L. J., Harlos, M., . . . Murray, A. (2009). The landscape of distress in the terminally ill. *Journal of Pain and Symptom Management*, 38(5), 641-649. doi:10.1016/j.jpainsymman.2009.04.021
- Cohen-Mansfield, J., Skornick-Bouchbinder, M., & Brill, S. (2017). Trajectories of end of life: A systematic review. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 73(4), 564-572. doi:10.1093/geronb/gbx093

- Coyne, J. C., & Smith, D. A. (1991). Couples coping with a myocardial infarction: A contextual perspective on wives' distress. *Journal of Personality and Social Psychology*, 61(3), 404-412.
- Debrot, A., Schoebi, D., Perrez, M., & Horn, A. B. (2013). Touch as an interpersonal emotion regulation process in couples' daily lives: The mediating role of psychological intimacy. *Personality and Social Psychology Bulletin*, 39(10), 1373-1385. doi:10.1177/0146167213497592
- Destatis. (2018) Bevölkerung und Erwerbstätigkeit: Haushalte und Familien Ergebnisse des Mikrozensus. In: Statistisches Bundesamt.
- Diener, E., & Chan, M. Y. (2011). Happy people live longer: Subjective well-being contributes to health and longevity. *Applied Psychology: Health and Well-Being*, 3(1), 1-43. doi:10.1111/j.1758-0854.2010.01045.x
- Diener, E., Oishi, S., & Lucas, R. E. (2003). Personality, culture, and subjective well-being: Emotional and cognitive evaluations of life. *Annual Review of Psychology*, 54(1), 403-425.
- Diener, E., & Suh, E. (1997). Age and subjective well-being: An international analysis. *Annual Review of Gerontology and Geriatrics*, 17(304-324).
- Dohrenwend, B. S., Askenasy, A. R., Krasnoff, L., & Dohrenwend, B. P. (1978). Exemplification of a method for scaling life events: The PERI Life Events Scale. *Journal of Health and Social Behavior*, 19(2), 205-229. doi:10.2307/2136536
- Dyrdal, G. M., & Lucas, R. E. (2013). Reaction and adaptation to the birth of a child: A couple-level analysis. *Developmental Psychology*, 49(4), 749-761.
- Dyrenforth, P. S., Kashy, D. A., Donnellan, M. B., & Lucas, R. E. (2010). Predicting relationship and life satisfaction from personality in nationally representative samples from three countries: The relative importance of actor, partner, and similarity effects. *Journal of Personality and Social Psychology*, 99(4), 690-702. doi:10.1037/a0020385

- Evans, A. J. (1994). Anticipatory grief: A theoretical challenge. *Palliative Medicine*, 8(2), 159-165. doi:10.1177/026921639400800211
- Gana, K., Bailly, N., Saada, Y., Joulain, M., & Alaphilippe, D. (2012). Does life satisfaction change in old age: Results from an 8-year longitudinal study. *The Journals of Gerontology: Series B*, 68(4), 540-552. doi:10.1093/geronb/gbs093
- Garcia, R., & Kenny, D. A. (2018). DATIC: Dyadic Data Analysis 2018 Workshop. Retrieved from https://randilgarcia.github.io/week-dyad-workshop/Over%20Time_Intro.pdf
- Gardner, D. S. (2008). Cancer in a dyadic context: Older couples' negotiation of ambiguity and search for meaning at the end of life. *Journal of Social Work in End-of-Life & Palliative Care*, 4(2), 135-159. doi:10.1080/15524250802353959
- Gerlach, K., Ram, N., Infurna, F. J., Vogel, N., Wagner, G. G., & Gerstorf, D. (2017). The role of morbidity for proxy-reported well-being in the last year of life. *Developmental Psychology*, 53(9), 1795-1809. doi:10.1037/dev0000368
- Gerstorf, D., Heckhausen, J., Ram, N., Infurna, F. J., Schupp, J., & Wagner, G. G. (2014). Perceived personal control buffers terminal decline in well-being. *Psychology and Aging*, 29(3), 612-625. doi:10.1037/a0037227
- Gerstorf, D., & Ram, N. (2015). A framework for studying mechanisms underlying terminal decline in well-being. *International Journal of Behavioral Development*, 39(3), 210-220. doi:10.1177/0165025414565408
- Gerstorf, D., Ram, N., Estabrook, R., Schupp, J., Wagner, G. G., & Lindenberger, U. (2008). Life satisfaction shows terminal decline in old age: Longitudinal evidence from the German Socio-Economic Panel Study (SOEP). *Developmental Psychology*, 44(4), 1148-1159. doi:10.1037/0012-1649.44.4.1148
- Gerstorf, D., Ram, N., Mayraz, G., Hidajat, M., Lindenberger, U., Wagner, G. G., & Schupp, J. (2010). Late-life decline in well-being across adulthood in Germany, the United

- Kingdom, and the United States: Something is seriously wrong at the end of life. *Psychology and Aging*, 25(2), 477-485. doi:10.1037/a0017543
- Gerstorf, D., Ram, N., Röcke, C., Lindenberger, U., & Smith, J. (2008). Decline in life satisfaction in old age: Longitudinal evidence for links to distance-to-death. *Psychology and Aging*, 23(1), 154-168. doi:10.1037/0882-7974.23.1.154
- Goebel, J., Grabka Markus, M., Liebig, S., Kroh, M., Richter, D., Schröder, C., & Schupp, J. (2019). The German Socio-Economic Panel (SOEP). In *Jahrbücher für Nationalökonomie und Statistik* (Vol. 239, pp. 345-360).
- Goodman, C. R., & Shippy, R. A. (2002). Is it contagious? Affect similarity among spouses. *Aging & Mental health*, 6(3), 266-274.
- Grundy, E., & Kravdal, Ø. (2007). Reproductive history and mortality in late middle age among Norwegian men and women. *American Journal of Epidemiology*, 167(3), 271-279. doi:10.1093/aje/kwm295
- Gustavson, K., Røysamb, E., Borren, I., Torvik, F. A., & Karevold, E. (2016). Life satisfaction in close relationships: Findings from a longitudinal study. *Journal of Happiness Studies*, 17(3), 1293-1311. doi:10.1007/s10902-015-9643-7
- Hamarat, E., Thompson, D., Steele, D., Matheny, K., & Simons, C. (2002). Age differences in coping resources and satisfaction with life among middle-aged, young-old, and oldest-old adults. *The Journal of Genetic Psychology*, 163(3), 360-367. doi:10.1080/00221320209598689
- Hatfield, E., Cacioppo, J. T., & Rapson, R. L. (1993). Emotional contagion. *Current Directions in Psychological Science*, 2(3), 96-100. doi:10.1111/1467-8721.ep10770953
- Havighurst, J. H. (1972). *Developmental Tasks and Education*. New York: Longman Inc.

- Heller, D., Watson, D., & Ilies, R. (2004). The role of person versus situation in life satisfaction: A critical examination. *Psychological Bulletin*, 130(4), 574-600.
doi:10.1037/0033-2909.130.4.574
- Ho, D., Imai, K., King, G., & Stuart, E. (2007). Matching as nonparametric preprocessing for reducing model dependence in parametric causal inference. *Political Analysis*, 15(3).
doi:10.1093/pan/mpl013
- Holmes, T. H., & Rahe, R. H. (1967). The social readjustment rating scale. *Journal of Psychosomatic Research*, 11(2), 213-218. doi:10.1016/0022-3999(67)90010-4
- Hoppmann, C. A., Gerstorf, D., Willis, S. L., & Schaie, K. W. (2011). Spousal interrelations in happiness in the Seattle Longitudinal Study: Considerable similarities in levels and change over time. *Developmental Psychology*, 47(1), 1.
- Hudson, N. W., Lucas, R. E., & Donnellan, M. B. (2019). Healthier and happier? A 3-year longitudinal investigation of the prospective associations and concurrent changes in health and experiential well-being. *Personality and Social Psychology Bulletin*.
doi:10.1177/0146167219838547
- Hutteman, R., Hennecke, M., Orth, U., Reitz, A. K., & Specht, J. (2014). Developmental tasks as a framework to study personality development in adulthood and old age. *European Journal of Personality*, 28(3), 267-278. doi:10.1002/per.1959
- Infurna, F. J., Wiest, M., Gerstorf, D., Ram, N., Schupp, J., Wagner, G. G., & Heckhausen, J. (2016). Changes in life satisfaction when losing one's spouse: Individual differences in anticipation, reaction, adaptation and longevity in the German Socio-economic Panel Study (SOEP). *Ageing and Society*, 37(5), 899-934.
doi:10.1017/S0144686X15001543
- Irimata, K., & Li, X. (2018). Estimation of correlation coefficient in data with repeated measures. *SAS Global Forum Proceedings*. Retrieved from

<https://www.sas.com/content/dam/SAS/support/en/sas-global-forum-proceedings/2018/2424-2018.pdf>

- Kaschowitz, J., & Brandt, M. (2017). Health effects of informal caregiving across Europe: A longitudinal approach. *Social Science & Medicine*, 173, 72-80.
doi:10.1016/j.socscimed.2016.11.036
- Kashy, D. A., & Donnellan, M. B. (2008). Comparing MLM and SEM approaches to analyzing developmental dyadic data: Growth curve models of hostility in families. In N. A. Card, J. P. Selig, & T. D. Little (Eds.), *Modeling dyadic and interdependent data in the developmental and behavioral sciences* (pp. 165-190). New York: Routledge.
- Kashy, D. A., Donnellan, M. B., Burt, S. A., & McGue, M. (2008). Growth curve models for indistinguishable dyads using multilevel modeling and structural equation modeling: The case of adolescent twins' conflict with their mothers. *Developmental Psychology*, 44(2), 316. doi:10.1037/0012-1649.44.2.316
- Kelley, H. H., Berscheid, E., Christensen, A., Harvey, J. H., Huston, T. L., Levinger, G., . . . Peterson, D. R. (1983). Analyzing close relationships. In H. H. Kelley, E. Berscheid, A. Christensen, J. H. Harvey, T. L. Huston, G. Levinger, & E. McClintock (Eds.), *Close Relationships*. New York: W. H. Freeman.
- Kenny, D. A. (1996). Models of non-independence in dyadic research. *Journal of Social and Personal Relationships*, 13(2), 279-294. doi:10.1177/0265407596132007
- Kenny, D. A., & Cook, W. (1999). Partner effects in relationship research: Conceptual issues, analytic difficulties, and illustrations. *Personal Relationships*, 6(4), 433-448.
doi:10.1111/j.1475-6811.1999.tb00202.x
- Klaus, D., & Tesch-Römer, C. (2017). Pflege und Unterstützung bei gesundheitlichen Einschränkungen: Welchen Beitrag leisten Personen in der zweiten Lebenshälfte für andere? In K. Mahne, J. K. Wolff, J. Simonson, & C. Tesch-Römer (Eds.), *Altern im*

- Wandel: Zwei Jahrzehnte Deutscher Alterssurvey (DEAS)* (pp. 185-200). Wiesbaden: Springer.
- Kööts-Ausmees, L., & Realo, A. (2015). The Association between life satisfaction and self-reported health status in Europe. *European Journal of Personality*, 29(6), 647-657. doi:10.1002/per.2037
- Kunzmann, U., & Isaacowitz, D. (2017). Emotional aging: Taking the immediate context seriously. *Research in Human Development*, 14(3), 182-199. doi:10.1080/15427609.2017.1340048
- Kunzmann, U., Little, T. D., & Smith, J. (2000). Is age-related stability of subjective well-being a paradox? Cross-sectional and longitudinal evidence from the Berlin Aging Study. *Psychology and Aging*, 15(3), 511.
- Larson, R. W., & Almeida, D. M. (1999). Emotional transmission in the daily lives of families: A new paradigm for studying family process. *Journal of Marriage and Family*, 61(1), 5-20. doi:10.2307/353879
- Laurenceau, J.-P., & Bolger, N. (2005). Using diary methods to study marital and family processes. *Journal of Family Psychology*, 19(1), 86-97. doi:10.1037/0893-3200.19.1.86
- Littell, R. C., Milliken, G. A., Stroup, W. W., Wolfinger, R. D., & Schabenberger, O. (2006). *SAS for Mixed Models* (S. Edition Ed.). Cary, NC, USA: SAS Institute Inc.
- Lucas, R. E., Clark, A. E., Georgellis, Y., & Diener, E. (2003). Reexamining adaptation and the set point model of happiness: Reactions to changes in marital status. *Journal of Personality and Social Psychology*, 84(3), 527-539. doi:10.1037/0022-3514.84.3.527
- Luhmann, M., Weiss, P., Hosoya, G., & Eid, M. (2014). Honey, I got fired! A longitudinal dyadic analysis of the effect of unemployment on life satisfaction in couples. *Journal of Personality and Social Psychology*, 107(1), 163-180. doi:10.1037/a0036394

Lundin, A., Lundberg, I., Hallsten, L., Ottosson, J., & Hemmingsson, T. (2010).

Unemployment and mortality—A longitudinal prospective study on selection and causation in 49321 Swedish middle-aged men. *Journal of Epidemiology and Community Health*, 64(1), 22-28. doi:10.1136/jech.2008.079269

Magnusson, D. (1990). Personality development from an interactional perspective. In L.

Pervin (Ed.), *Handbook of personality: Theory and research* (pp. 193-222).

McLean, L. M., & Jones, J. M. (2007). A review of distress and its management in couples facing end-of-life cancer. *Psycho-Oncology*, 16(7), 603-616. doi:10.1002/pon.1196

Moon, J. R., Kondo, N., Glymour, M. M., & Subramanian, S. V. (2011). Widowhood and mortality: A meta-analysis. *PLOS ONE*, 6(8). doi:10.1371/journal.pone.0023465

Mroczek, D. K., & Spiro III, A. (2005). Change in life satisfaction during adulthood: Findings from the Veterans Affairs Normative Aging Study. *Journal of Personality and Social Psychology*, 88(1), 189-202. doi:10.1037/0022-3514.88.1.189

Mueller, S., Wagner, J., Wagner, G. G., Ram, N., & Gerstorf, D. (2018). How far reaches the power of personality? Personality predictors of terminal decline in well-being. *Journal of Personality and Social Psychology*, 115(5). doi:10.1037/pspp0000184

Neugarten, B. L. (1979). Time, age, and the life cycle. *American Journal of Psychiatry*, 136(7), 887-894. doi:10.1176/ajp.136.7.887

Nielsen, M. K., Neergaard, M. A., Jensen, A. B., Bro, F., & Guldin, M.-B. (2016). Do we need to change our understanding of anticipatory grief in caregivers? A systematic review of caregiver studies during end-of-life caregiving and bereavement. *Clinical Psychology Review*, 44, 75-93. doi:10.1016/j.cpr.2016.01.002

Orth, U., Erol, R. Y., Ledermann, T., & Grob, A. (2018). Codevelopment of well-being and self-esteem in romantic partners: Disentangling the effects of mutual influence and shared environment. *Developmental Psychology*, 54(1), 151. doi:10.1037/dev0000400

- Park, J. M., Oh, U., Roh, B.-R., & Moon, Y. (2017). Disparities in mortality by disability: An 11-year follow-up study of 1 million individuals. *International Journal of Public Health*, 62(9), 989-996. doi:10.1007/s00038-017-0966-5
- Paykel, E. S., Prusoff, B. A., & Uhlenhuth, E. H. (1971). Scaling of life events. *Archives of General Psychiatry*, 25(4), 340-347. doi:10.1001/archpsyc.1971.01750160052010
- Powdthavee, N. (2009). I can't smile without you: Spousal correlation in life satisfaction. *Journal of Economic Psychology*, 30(4), 675-689. doi:10.1016/j.joep.2009.06.005
- R Core Team. (2016). *R: A Language and Environment for Statistical Computing*. R Foundation for Statistical Computing.
- Roberts, B. W., Kuncel, N. R., Shiner, R., Caspi, A., & Goldberg, L. R. (2007). The power of personality: The comparative validity of personality traits, socioeconomic status, and cognitive ability for predicting important life outcomes. *Perspectives on Psychological Science*, 2(4), 313-345. doi:10.1111/j.1745-6916.2007.00047.x
- Rook, K. S., Catalano, R., & Dooley, D. (1989). The timing of major life events: Effects of departing from the social clock. *American Journal of Community Psychology*, 17(2), 233-258. doi:10.1007/bf00931009
- Rusbult, C. E., & Van Lange, P. A. M. (2008). Why we need interdependence theory. *Social and Personality Psychology Compass*, 2(5), 2049-2070. doi:10.1111/j.1751-9004.2008.00147.x
- Schade, H. M., Hülür, G., Infurna, F. J., Hoppmann, C. A., & Gerstorf, D. (2016). Partner dissimilarity in life satisfaction: Stability and change, correlates, and outcomes. *Psychology and Aging*, 31(4), 327-339. doi:10.1037/pag0000096
- Schimmack, U., & Lucas, R. (2010). Environmental influences on well-being: A dyadic latent panel analysis of spousal similarity. *Social Indicators Research*, 98(1), 1-21. doi:10.1007/s11205-009-9516-8

- Schoebi, D. (2008). The coregulation of daily affect in marital relationships. *Journal of Family Psychology*, 22(4), 595. doi:10.1037/0893-3200.22.3.595
- Schulz, R., & Sherwood, P. R. (2008). Physical and mental health effects of family caregiving. *Journal of Social Work Education*, 44(sup3), 105-113. doi:10.5175/JSWE.2008.773247702
- Sels, L., Ceulemans, E., Bulteel, K., & Kuppens, P. (2016). Emotional interdependence and well-being in close relationships. *Frontiers in Psychology*, 7(283). doi:10.3389/fpsyg.2016.00283
- Steptoe, A., Deaton, A., & Stone, A. A. (2015). Subjective wellbeing, health, and ageing. *Lancet*, 385(9968), 640-648. doi:10.1016/S0140-6736(13)61489-0
- Stone, A. A., Schwartz, J. E., Broderick, J. E., & Deaton, A. (2010). A snapshot of the age distribution of psychological well-being in the United States. *Proceedings of the National Academy of Sciences of the United States of America*, 107(22), 9985-9990. Retrieved from <http://www.jstor.org/stable/25681717>
- Stroebe, M., Schut, H., & Stroebe, W. (2007). Health outcomes of bereavement. *Lancet*, 370(9603), 1960-1973. doi:10.1016/S0140-6736(07)61816-9
- Thompson, A., & Bolger, N. (1999). Emotional transmission in couples under stress. *Journal of Marriage and Family*, 61(1), 38-48. doi:10.2307/353881
- Townsend, A. L., Miller, B., & Guo, S. (2001). Depressive symptomatology in middle-aged and older married couples: A dyadic analysis. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 56(6), 352-364.
- Vable, A. M., Subramanian, S. V., Rist, P. M., & Glymour, M. M. (2015). Does the “widowhood effect” precede spousal bereavement? Results from a nationally representative sample of older adults. *The American Journal of Geriatric Psychiatry*, 23(3), 283-292. doi:10.1016/j.jagp.2014.05.004

- Westman, M. (2001). Stress and Strain Crossover. *Human Relations*, 54(6), 717-751.
doi:10.1177/0018726701546002
- Wortman, J., & Lucas, R. E. (2016). Spousal similarity in life satisfaction before and after divorce. *Journal of Personality and Social Psychology*, 110(4), 625-633.
doi:10.1037/pspp0000065
- Wrzus, C., & Mehl, M. R. (2015). Lab and/or field? Measuring personality processes and their social consequences. *European Journal of Personality*, 29(2), 250-271.
doi:10.1002/per.1986
- Yap, S. C. Y., Anusic, I., & Lucas, R. E. (2012). Does personality moderate reaction and adaptation to major life events? Evidence from the British Household Panel Survey. *Journal of Research in Personality*, 46(5), 477-488. doi:10.1016/j.jrp.2012.05.005

Footnotes

¹ We compared the final analysis sample ($N_{\text{couples}} = 1,450$) against the excluded sample of couples that experienced [partner] death but was omitted from the present analyses because they did not meet our selection criteria ($N_{\text{couples}} = 722$). At baseline, the final analysis sample did not significantly differ from the excluded sample in terms of age ($t(2413) = -0.51$, $p = .609$), education ($t(2241) = 1.79$, $p = .073$), disability status, $\chi^2 = 0.63$ (1, $N = 4,336$), $p = .426$, employment status, $\chi^2 = 0.98$ (1, $N = 4,336$), $p = .32$, and life satisfaction ($t(2350) = 1.77$, $p = .076$). With regard to marital status and the frequency of participation, we found that couple members in the final analysis sample were more likely to be married $\chi^2 = 91.32$ (1, $N = 4,336$), $p < .001$, and they also provided more observation points ($t(2769) = -4.69$, $p < .001$).

² Marital status did not emerge as a significant predictor of [partner] death. Consequently, we excluded marital status from the final matching procedure.

³ We conducted a parallel set of analyses in which we included both partners' functional limitations as an additional indicator of health. Findings were widely robust against the inclusion of this additional indicator of health, (i.e. we observed the same pattern of linear and non-linear decline, between-partner transmission effects, and between-partner differences in the estimated trajectories of life satisfaction). We did, however, identify a deviating finding with regard to the between-partner correlation of couples in the event sample and in the control sample: When including functional limitations as an additional indicator of health, weaker between-partner correlations among event couples only emerged for the quadratic slope but not for the linear slope. For a detailed description of these findings, see Supplemental Tables 3-6.

⁴We also sought to introduce random effects for the time-lagged actor and partner effects of life satisfaction but the models did not converge when we included the additional random terms.

⁵We report confidence intervals obtained from the simpler multilevel dyadic growth models of life satisfaction. The same pattern of differences was evident when relying on the confidence intervals of the Fisher's z-transformed between-partner correlations of the intercept (95% CI $r_{DB\_Intercept} = [0.84, 0.94]$, 95% CI $r_{AB\_Intercept} = [0.84, 0.94]$), linear slope (95% CI $r_{DB\_Linear\ slope} = [0.66, 0.76]$, 95% CI $r_{AB\_Linear\ Slope} = [0.84, 0.94]$), quadratic slope (95% CI $r_{DB\_Quadratic\ slope} = [0.60, 0.70]$, 95% CI $r_{AB\_Quadratic\ slope} = [0.99, 1.10]$), and residuals (95% CI $r_{DB\_Residuals} = [0.37, 0.48]$, 95% CI $r_{AB\_Residuals} = [0.31, 0.42]$) obtained from the longitudinal actor-partner-interdependence models.

⁶In an exploratory set of analyses, we tested time-to-event as a moderator of the longitudinal actor and partner effects of life satisfaction. In both samples, the strength of the partner effect neither increased nor decreased with an increasing proximity to the year of event ($\gamma_{Event\_Partner \times Time} = -0.0003$, $t(22,000) = -0.26$, $p = .794$; $\gamma_{Control\_Partner \times Time} = -0.0004$, $t(22,000) = -0.41$, $p = .680$). The strength of the actor effect decreased across time in both samples ($\gamma_{Event\_Actor \times Time} = -0.006$, $t(24,000) = -6.48$, $p = <.001$; $\gamma_{Control\_Actor \times Time} = -0.009$, $t(22,000) = -10.49$, $p = <.001$).

Table 1

Characteristics of the Event Sample and the Matched Control Sample

	Event sample			Control sample		
	<i>M</i> or %	<i>SD</i>	Range	<i>M</i> or %	<i>SD</i>	Range
First assessment						
Age	57.58	12.60	19-91	57.53	12.95	19-89
Married	95			94		
Years of marriage	30.64	13.24	0-64	31.28	14.27	0-64
Disability status(yes)	17			16		
Years of education	10.96	2.22	7-18	10.97	2.16	7-18
Employment (yes)	35			35		
Children (yes)	89			88		
Year before event						
Age	68.35	11.71	25-100	67.47	12.83	26-94
Married	95			94		
Years of marriage	40.95	13.40	1-69	40.75	15.06	1-68
Disability status (yes)	32			24		
Years of education	10.85	2.49	7-18	10.71	2.91	7-18
Employment (yes)	19			26		
Children (yes)	89			88		

Note. $N_{\text{couples}} = 1,450$ in both samples. With regard to the baseline values in the displayed variables, t-tests and chi-square tests revealed no significant differences between couple members in the event sample and couple members in the matched control sample.

Table 2

Hypothetical Couple Data and Variable Coding in the Event Sample

Couple ID	Person ID	To-be-deceased	To-be-bereaved	Partner role	LS	Partner LS	Disability	Partner Disability
10	101	1	0	1	8	9	0	0
10	101	1	0	1	7	8	0	0
10	101	1	0	1	8	8	0	0
10	101	1	0	1	8	9	0	0
10	101	1	0	1	7	7	0	0
10	101	1	0	1	7	8	1	0
10	101	1	0	1	7	7	1	0
10	102	0	1	-1	9	8	0	0
10	102	0	1	-1	8	7	0	0
10	102	0	1	-1	8	8	0	0
10	102	0	1	-1	9	8	0	0
10	102	0	1	-1	7	7	0	0
10	102	0	1	-1	8	7	0	1
10	102	0	1	-1	7	7	0	1

Note. The variables to-be-deceased (1 = *yes*, 0 = *no*) and to-be-bereaved (1 = *yes*, 0 = *no*) are dummy-coded variables that were included in the dual-intercept models so that we could obtain separate estimates for both partners. These variables indicate whether an observation belongs to the to-be-deceased or to-be-bereaved partner. The effect-coded variable partner role also distinguishes between couple members (1 = *to-be-deceased partner*, -1 = *to-be-bereaved partner*) and it was used to test for interaction effects. Years-to-event represent the years to [partner] death. LS = raw scores of life satisfaction. The variable disability is coded as 0 (*no certified disability status*) versus 1 (*certified disability status*).

Table 3

Estimated Parameters for the Dyadic Growth Model in the Event Sample

Effect	To-be-deceased partner			Both partners			To-be-bereaved partner		
	Estimate	SE	p	Estimate	SE	p	Estimate	SE	p
Fixed effects									
Disability				-1.29	0.17	<.001			
Linear slope	-1.01	0.06	<.001				-0.59	0.05	<.001
Quadratic slope	-0.04	0.003	<.001				-0.02	0.003	<.001
Intercept	45.50	0.31	<.001				48.62	0.26	<.001
Disability $\times$ partner role				-0.28	0.15	.071			
Linear slope $\times$ partner role				-0.21	0.03	<.001			
Quadratic slope $\times$ partner role				-0.01	0.001	<.001			
Intercept $\times$ partner role				-1.56	0.13	<.001			
Random effects (within-partner)									
Variance linear slope	2.32 (1.52)	0.21	<.001				1.21 (1.1)	0.12	<.001
Variance quadratic slope	0.004 (0.06)	0.001	<.001				0.002 (0.05)	0.0003	<.001
Variance intercept	103.40 (10.17)	4.82	<.001				75.52 (8.69)	3.54	<.001
Covariance intercept, linear slope	8.22 (0.53)	0.80	<.001				3.74 (0.39)	0.52	<.001
Covariance intercept, quadratic slope	0.22 (0.33)	0.04	<.001				0.05 (0.14)	0.03	.031
Covariance linear slope, quadratic slope	0.09 (0.94)	0.01	<.001				0.05 (0.62)	0.01	<.001
Random effects (between-partner)									
Covariance intercept _{-D} , intercept _{-B}				62.94 (0.71)	3.47	<.001			
Covariance linear slope _{-D} , linear slope _{-B}				1.14 (0.68)	.13	<.001			
Covariance quadratic slope _{-D} , quadratic slope _{-B}				0.05 (0.67)	0.0004	<.001			
Covariance intercept _{-D} , linear slope _{-B}				3.36 (0.53)	0.80	<.001			
Covariance intercept _{-D} , quadratic slope _{-B}				0.06 (0.12)	0.03	.066			
Covariance linear slope _{-D} , quadratic slope _{-B}				0.04 (0.62)	0.01	<.001			

Covariance intercept- <i>B</i> , linear slope- <i>D</i>				3.00 (0.23)	0.61	<.001		
Covariance intercept- <i>B</i> , quadratic slope- <i>D</i>				0.04 (0.07)	0.03	.182		
Covariance linear slope- <i>B</i> , quadratic slope- <i>D</i>				0.04 (0.62)	0.01	<.001		
Residual variance	56.84 (7.54)	0.73	<.001				44.35 (6.66)	0.57 <.001
Between-partner covariance of residuals				19.58 (0.39)	0.01	<.001		

Notes. $N_{\text{couples}} = 1,450$. We report unstandardized estimates and standard errors for the fixed effects. Standard deviations and correlations are reported in brackets behind the variance and covariance estimates. Life satisfaction scores were transformed into a T-metric, relying on life satisfaction scores of the entire SOEP 2002 sample ($M = 6.90$, $SD = 1.81$). Intercepts were centered around the year before [partner] death. Linear and quadratic slope effects are scaled in T-units per year. The variable disability was included as a time lagged variable ($k-1$) and is coded as 0 (*no certified disability status*) versus 1 (*certified disability status*). The variable partner role is coded as 1 (*to-be-deceased*) and -1 (*to-be-bereaved*). We report only one fixed effect estimate for both couple members if there was no significant interaction effect of partner role.

Table 4

Estimated Parameters for the Longitudinal Actor-Partner Interdependence Model in the Event Sample

Effect	To-be-deceased partner			Both partners			To-be-bereaved partner		
	Estimate	SE	p	Estimate	SE	p	Estimate	SE	p
Fixed effects									
Actor disability status				-1.04	0.19	<.001			
Partner disability status				0.53	0.19	.006			
Actor life satisfaction				0.01	0.01	.141			
Partner life satisfaction				0.03	0.01	<.001			
Linear slope	-0.98	0.06	<.001				-0.57	0.05	<.001
Quadratic slope	-0.03	0.003	<.001				-0.02	0.002	<.001
Intercept	45.35	0.32	<.001				48.45	0.27	<.001
Actor disability status × Partner role				-0.27	0.20	.168			
Partner disability status × Partner role				0.06	0.20	.769			
Actor life satisfaction × Partner role				0.01	0.01	.055			
Partner life satisfaction × Partner role				-0.01	0.01	.458			
Linear slope × Partner role				-0.20	0.03	<.001			
Quadratic slope × Partner role				-0.01	0.001	<.001			
Intercept × Partner role				-1.55	0.13	<.001			
Random effects (within-partner)									
Variance linear slope	2.02 (1.42)	0.20	<.001				1.08 (1.04)	0.12	<.001
Variance quadratic slope	0.004 (0.06)	0.001	<.001				0.002 (0.04)	0.0003	<.001
Variance intercept	101.46 (10.07)	4.81	<.001				75.27 (8.68)	3.57	<.001
Covariance intercept, linear slope	7.51 (0.52)	0.79	<.001				3.50 (0.39)	0.52	<.001
Covariance intercept, quadratic slope	0.19 (0.32)	0.04	<.001				0.05 (0.12)	0.02	.066
Covariance linear slope, quadratic slope	0.08 (0.94)	0.01	<.001				0.04 (0.89)	0.01	<.001

Random effects (between-partner)							
Covariance intercept- <i>D</i> , intercept- <i>B</i>	61.68 (0.71)	3.48	<.001				
Covariance linear slope- <i>D</i> , linear slope- <i>B</i>	0.90 (0.61)	0.12	<.001				
Covariance quadratic slope- <i>D</i> , quadratic slope- <i>B</i>	0.001 (0.57)	0.0003	<.001				
Covariance intercept- <i>D</i> , linear slope- <i>B</i>	2.78 (0.26)	0.57	<.001				
Covariance intercept- <i>D</i> , quadratic slope- <i>B</i>	0.03 (0.08)	0.03	.246				
Covariance linear slope- <i>D</i> , quadratic slope- <i>B</i>	0.03 (0.53)	0.01	<.001				
Covariance intercept- <i>B</i> , linear slope- <i>D</i>	2.46 (0.20)	0.59	<.001				
Covariance intercept- <i>B</i> , quadratic slope- <i>D</i>	0.02 (0.04)	0.03	.467				
Covariance linear slope- <i>B</i> , quadratic slope- <i>D</i>	0.03 (0.53)	0.01	<.001				
Residual variance	57.26 (7.57)	0.75	<.001		44.39 (6.66)	0.58	<.001
Between-partner covariance of residuals	20.17 (0.40)	0.01	<.001				

Notes. $N_{\text{couples}} = 1,450$. We report unstandardized estimates and standard errors for the fixed effects. Standard deviations and correlations are reported in brackets behind the variance and covariance estimates. Life satisfaction scores were transformed into a T-metric, relying on life satisfaction scores of the entire SOEP 2002 sample ($M = 6.90$, $SD = 1.81$). Intercepts were centered around the year before [partner] death. Linear and quadratic slope effects are scaled in T-units per year. Actor and partner disability status were included as time lagged predictor variables ($k-1$) and coded as 0 (*no certified disability status*) versus 1 (*certified disability status*). Actor and partner life satisfaction were included as time-lagged ($k-1$), person-mean-centered predictor variables. Partner role is coded as 1 (*to-be-deceased*) versus -1 (*to-be-bereaved*). We report only one fixed effect estimate for both couple members if there was no significant interaction effect of partner role.

Table 5

Estimated Parameters for the Dyadic Growth Model in the Matched Control Sample

Effect	Partner A			Both partners			Partner B		
	Estimate	SE	p	Estimate	SE	p	Estimate	SE	p
Fixed effects									
Disability status				-1.38	0.17	<.001			
Linear slope				-0.32	0.04	<.001			
Quadratic slope				-0.01	0.002	<.001			
Intercept				50.98	0.20	<.001			
Disability status × Partner role				0.30	0.16	.059			
Linear slope × Partner role				-0.01	0.02	.434			
Quadratic slope × Partner role				-0.001	0.001	.339			
Intercept × Partner role				0.09	0.10	.374			
Random effects (within-partner)									
Variance linear slope	0.88 (0.94)	0.09	<.001				0.81 (0.90)	0.08	<.001
Variance quadratic slope	0.002 (0.04)	0.0003	<.001				0.002 (0.04)	0.0003	<.001
Variance intercept	58.53 (7.65)	2.60	<.001				54.14 (7.36)	2.46	<.001
Covariance intercept, linear slope	3.11 (0.43)	0.38	<.001				2.46 (0.37)	0.36	<.001
Covariance intercept, quadratic slope	0.07 (0.23)	0.02	.0004				0.04 (0.15)	0.02	.030
Covariance linear slope, quadratic slope	0.04 (0.90)	0.004	<.001				0.03 (0.87)	0.004	<.001
Random effects (between-partner)									
Covariance intercept _A , intercept _B				40.43 (0.72)	2.13	<.001			
Covariance linear slope _A , linear slope _B				0.66 (0.78)	0.07	<.001			
Covariance quadratic slope _A , quadratic slope _B				0.001 (0.85)	0.0002	<.001			
Covariance intercept _A , linear slope _B				1.73 (0.25)	0.36	<.001			
Covariance intercept _A , quadratic slope _B				0.04 (0.12)	0.02	.089			
Covariance linear slope _A , quadratic slope _B				0.03 (0.73)	0.004	<.001			

Covariance intercept _B , linear slope _A				1.60 (0.23)	0.34	<.001			
Covariance intercept _B , quadratic slope _A				0.03 (0.08)	0.02	.196			
Covariance linear slope _B , quadratic slope _A				0.03 (0.70)	0.004	<.001			
Residual variance	40.47 (6.36)	0.54	<.001				43.68 (6.61)	0.58	<.001
Between-partner covariance of residuals				14.29 (0.34)	0.01	<.001			

Notes. $N_{\text{couples}} = 1,450$. We report unstandardized estimates and standard errors for the fixed effects. Standard deviations and correlations are reported in brackets behind the variance and covariance estimates. Life satisfaction scores were transformed into a T-metric, relying on life satisfaction scores of the entire SOEP 2002 sample ($M = 6.90$, $SD = 1.81$). Intercepts were centered around the year before last survey participation. Linear and quadratic slope effects are scaled in T-units per year. The variable disability was included as a time lagged predictor variable ($k-1$) and is coded as 0 (*no certified disability status*) versus 1 (*certified disability status*). The variable partner role is coded as 1 (*partner A*) and -1 (*partner B*). We report only one fixed effect estimate for both couple members if there was no significant interaction effect of partner role.

Table 6

Estimated Parameters for the Longitudinal Actor-Partner Interdependence Model in the Matched Control Sample

Effect	Partner A			Both partners			Partner B		
	Estimate	SE	p	Estimate	SE	p	Estimate	SE	p
Fixed effects									
Actor disability status				-1.33	0.19	<.001			
Partner disability status				0.16	0.19	.407			
Actor life satisfaction				-0.01	0.01	.053			
Partner life satisfaction				0.04	0.01	<.001			
Linear slope				-0.31	0.04	<.001			
Quadratic slope				-0.01	0.002	<.001			
Intercept				50.94	0.21	<.001			
Actor disability status × Partner role				0.36	0.20	.070			
Partner disability status × Partner role				-0.08	0.20	.675			
Actor life satisfaction × Partner role				0.01	0.01	.470			
Partner life satisfaction × Partner role				-0.01	0.01	.397			
Linear slope × Partner role				-0.02	0.02	.386			
Quadratic slope × Partner role				-0.001	0.001	.300			
Intercept × Partner role				0.11	0.10	.281			
Random effects (within-partner)									
Variance linear slope	0.83 (0.91)	0.09	<.001				0.77 (0.88)	0.09	<.001
Variance quadratic slope	0.002 (0.04)	0.0002	<.001				0.001 (0.03)	0.0003	<.001
Variance intercept	58.67 (7.66)	2.63	<.001				53.58 (7.32)	2.47	<.001
Covariance intercept, linear slope	3.13 (0.45)	0.39	<.001				2.44 (0.38)	0.36	<.001
Covariance intercept, quadratic slope	0.08 (0.25)	0.02	.0003				0.05 (0.16)	0.02	.023
Covariance linear slope, quadratic slope	0.03 (0.90)	0.004	<.001				0.03 (0.87)	0.005	<.001

Random effects (between-partner)							
Covariance intercept _A , intercept _B	39.70 (0.71)	2.14	<.001				
Covariance linear slope _A , linear slope _B	0.56 (0.71)	0.07	<.001				
Covariance quadratic slope _A , quadratic slope _B	0.001 (0.78)	0.0002	<.001				
Covariance intercept _A , linear slope _B	1.55 (0.23)	0.37	<.001				
Covariance intercept _A , quadratic slope _B	0.08 (0.11)	0.02	.127				
Covariance linear slope _A , quadratic slope _B	0.02 (0.66)	0.004	<.001				
Covariance intercept _B , linear slope _A	1.42 (0.21)	0.34	<.001				
Covariance intercept _B , quadratic slope _A	0.02 (0.07)	0.02	.255				
Covariance linear slope _B , quadratic slope _A	0.02 (0.64)	0.004	<.001				
Residual variance	40.34 (6.35)	0.55	<.001		43.68 (6.61)	0.60	<.001
Between-partner covariance of residuals	14.69 (0.35)	0.01	<.001				

Notes. $N_{\text{couples}} = 1,450$. We report unstandardized estimates and standard errors for the fixed effects. Standard deviations and correlations are reported in brackets behind the variance and covariance estimates. Life satisfaction scores were transformed into a T-metric, relying on life satisfaction scores of the entire SOEP 2002 sample ($M = 6.90$, $SD = 1.81$). Intercepts were centered around the year before last survey participation. Linear and quadratic slope effects are scaled in T-units per year. Actor and partner disability status were included as time lagged predictor variables ($k-1$) and coded as 0 (*no certified disability status*) versus 1 (*certified disability status*). Actor and partner life satisfaction were included as time-lagged ($k-1$), person-mean-centered predictor variables. Partner role is coded as 1 (*partner A*) versus -1 (*partner B*). We report only one fixed effect estimate for both couple members if there was no significant interaction effect of partner role.

Figure 1. Estimated trajectories of life satisfaction in couple members approaching the year of [partner] death and in couple members approaching the year of last survey participation. Life satisfaction scores were transformed into a T-metric, relying on life satisfaction scores of the entire SOEP 2002 sample ($M = 6.90$, $SD = 1.81$). Years-to-event were centered around the year before [partner] death or the year before last survey participation, respectively. For couple members in the control sample, we present only one line as the trajectories did not significantly differ between partners.