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Spousal loss and health in late life: moving beyond emotional trauma

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Abstract

Objectives—This study queries the linkage of older adults' spousal loss to multiple dimensions of their health.

Methods—Data are from the 2005-2006 National Social Life, Health, and Aging Project, nationally representative of U.S. adults ages 57-85. Analyses examine associations of spousal loss and time since loss with multiple health dimensions.

Results—Spousal loss is linked to a system of mental, social, behavioral, and biological issues, consistent with a stress-induced weathering process. Biological problems are more uniformly associated with women's than men's loss. While emotional sequelae may partially subside with time, a range of other outcomes remain worse even among individuals a decade or more past loss, than those with current partners.

Discussion—Older adults' spousal loss influences multiple dimensions of their health. Gender differences in biological linkages suggest women's greater physiological vulnerability to this weathering event. Effects of loss are long-term rather than transient, especially with biological conditions.

Keywords

spousal loss; late life; stress process; weathering

Introduction

A spate of recent studies focuses on spousal loss—whether through widowhood (Carr, 2003; Carr & Utz, 2002; Christakis & Allison, 2006; Elwert & Christakis, 2006; Keene & Prokos, 2008; Kendler, Thornton, & Prescott, 2001; Lee, DeMaris, Bavin, & Sullivan, 2001; Lieberman, 1996; Manzoli, Villari, Pirone, & Boccia, 2007; Schaefer, Quesenberry, & Wi, 1995; Williams, 2003) or divorce (Hughes & Waite, 2009; Johnson, Backlund, Sorlie, & Loveless, 2000; Lillard & Waite, 1995)—as a key turning-point in late life, leading to elevated risk of morbidity and mortality. Extant literature remains predominantly focused on a limited set of emotional sequelae. However, recent studies (Carr & Utz, 2002; Kiecolt-Glaser & Newton, 2001; Hughes & Waite, 2009) suggest a broad social and health impact of loss—linkages that remain underexplored. Moreover, contrary to previous conceptions of these effects as uniformly transient (Booth & Amato, 1991; Hetherington & Kelly, 2002), individual health dimensions may have distinct associational patterns with loss duration—with chronic conditions, that take time to develop, more likely to emerge among those with long-term loss (Hughes & Waite, 2009). Due to data limitations—particularly the lack of

large-sample surveys containing requisite social as well as biological indicators—these issues are yet to be examined.

Using data from the 2005-2006 U.S. National Health and Social Life Project (NSHAP)—a nationally representative probability sample of adult Americans aged 57 to 85—the present study begins to fill these gaps. Two questions are addressed: (1) the linkage of spousal loss to a multidimensional system of health—involving mental, social, behavioral, and biological conditions; and (2) potentially different associations of time since loss with specific health dimensions.

Dimensions of Health

As noted, numerous studies have established the emotional consequences of spousal loss, especially through widowhood, with a substantial literature also connecting this life event to subsequent mortality. Moreover, at least mental effects may be patterned by gender: consistent with greater psychological benefits from marriage among men than women (Gove & Tudor, 1973; Williams, 2003), some small-sample studies suggest more post-loss depression among the former (Chipperfield & Havens, 2001; Stroebe, 1998). However, recent biodemographic literature suggests that stressors generated by this life transition may also trigger a broader “weathering” process involving deficits in social connections, negative health behaviors—and, ultimately, biological problems (Geronimus, Hicken, Keene, & Bound, 2006). Weathering refers to the health impact of cumulative and multidimensional stress, and of consequent high-effort coping, which may “get under the skin” directly as well as through social and behavioral pathways. While previous studies (Geronimus, 2001; Geronimus et al., 2006; Seeman et al., 2008) have largely conceptualized weathering as generated by social stratification (race, socioeconomic status), the stress-process mechanisms involved are also applicable to the aftermath of life events. Marriages, for instance, tend to be embedded in a network of friends and family members, which may represent a key source of social and emotional support in late life (Carr & Utz, 2002; Elwert & Christakis, 2006). A large literature links such high-quality relationships with lower stress (Pearlin, 1999; Thoits, 2010; Waite & Hughes, 1999). Whether due to grief and consequent social withdrawal, or because one is socially connected through one’s spouse, widowhood or divorce may lead to a loss or weakening of ties to this stress-buffering relational web. In turn, both the “primary stressors” due to bereavement, and the “secondary stressors” represented by these loss-induced social deficits (Pearlin, 1999; Thoits, 2010), may lead to negative behaviors. An extensive literature, for instance, links psychosocial stress to both actively risky behavioral patterns such as smoking (Klungsoyr, Nygard, Sorensen, & Sandanger, 2006), and alcohol use (Davis, Uezato, Newell, & Frazier, 2008)—and passively negative ones such as poor sleep (American Psychiatric Association, 2000) and physical inactivity (Verger, Lions, & Ventelou, 2009).

Finally, as noted, biodemographic studies on stress-induced weathering indicate that chronic psychosocial pressures and their behavioral sequelae may also generate biological problems such as diabetic and cardiovascular issues. Behaviorally, multiple studies link these conditions to smoking (Ockene & Miller, 1997), alcoholism (Lakka et al., 2002), too much (Wilson, 2005) or too little sleep (Cappuccio et al., 2007; Miller et al., 2009), and inactivity (Haskell et al., 2007). An extensive literature also connects stress (de Wit et al., 2010; Spitzer et al., 1993) as well as negative behaviors (diet, inactivity) to obesity (Mokdad et al., 2001), and documents the causal role of obesity in poor blood-sugar control, diabetes, and heart disease (Grundy et al., 2004; Yudkin, 2003). Moreover, prolonged and antecedent psychosocial stress has been *directly* linked to blood sugar problems (Calhoun et al., 2010; Lustman et al., 2000), as well as cardiovascular issues such as elevated heart rate (Lampert et al., 2009) and blood pressure (BP) (Ariyo et al., 2000; Shinn et al., 2001). One mediatory

pathway may be through higher “allostatic load”—multi-systemic physiological wear-and-tear through chronic exposure to stress-induced elevations in neuroendocrine response (Geronimus et al., 2006; McEwen 1998; Singer, Ryff & Seeman 2004; Sterling & Eyer 1981). Put together, these multiple literatures suggest that the primary as well as secondary stressors generated by the loss of a spouse may, directly and/or through behaviors, trigger a cumulative pathogenic process culminating in biological problems. Given data limitations, the goal of the present study is not to trace the steps in this posited weathering sequence, but to examine broad linkages between spousal loss and this range of health outcomes.

As noted, the second question motivating this study was potentially varying associations of these multiple health dimensions with loss duration. The following section addresses these time patterns.

Time Since Loss

The literature is ambiguous on associations of time since spousal loss with health—even with delimited emotional outcomes. Some studies conceptualize widowhood or divorce/separation as a stress-inducing *event*—with the depressive effects of this episode (whether due to caregiving burdens preceding widowhood, emotional trauma, or hostile interactions during divorce) fading over time (Booth & Amato, 1991; Hetherington & Kelly, 2002). Others see the loss of a partner as inducing a chronically stressful *state*, that may last for years after the event (Carr et al., 2000; Johnson & Wu, 2002; Lee & Carr, 2007). In late life, children leave home, retirement leads to loss of work-related networks, parents and elders pass away, and health problems increasingly impede social interaction. Consequently, a spouse may become one’s strongest source of social and emotional support (Hughes, Waite, Hawkey, & Cacioppo, 2004; Waite & Das, 2010). Marriages (especially lasting ones) also tend to be characterized by intricate household divisions of labor, developed over years of tacit and explicit negotiations—as well as by intensive investments in partner-specific skills (Becker, 1981; Brines & Joyner, 1999). Arguably, the loss of these assets and investments may lead to long-term strain and coping pressures, and keep an individual from returning to pre-transition levels of emotional health. Thus, for instance, a recent *Interactive Biopsychosocial Model* of health (Lindau, Laumann, Levinson, & Waite, 2003) posits an intricate interweaving of an older couple’s lives, such that the demise of a partnership can induce prolonged and multidimensional stress for a focal individual. Finally, as noted, biodemographic studies on weathering specifically implicate an extended or cumulative stress-induced process in the pathogenesis of biological conditions (Geronimus et al., 2006; Seeman et al., 2008).

To summarize, in contrast to the focus on emotional health still dominant in the spousal loss literature, the arguments above suggest linkages of this event with a system of mental, social, behavioral, and biological factors. Moreover, these multiple outcomes may have distinct trajectories over time since loss—patterns that remain underexplored in the literature.

METHODS

Data

Data are from the 2005-2006 U.S. National Social Life, Health, and Aging Project. NSHAP is a nationally-representative probability sample of 1550 women and 1455 men aged 57 to 85, independently observed, with an oversampling of blacks, hispanics, men, and those 75 to 85. In addition to self reports, data include assessments of physical and sensory function, height and weight, and salivary, blood, and vaginal mucosal samples—all collected at the time of interview by non-medically trained interviewers. The survey has an unweighted

response rate of 74.8% and a weighted response rate of 75.5% (Lindau et al., 2007; O’Muircheartaigh & Smith, 2007).

In-home interviews of household-dwelling adults in these age ranges were conducted between July 2005 and March 2006, in both English and Spanish. Most interviewers were experienced personnel given further training in conducting interviews by the National Opinion Research Center (NORC) in Chicago, and remained with the project throughout the interview period. Participant consent was obtained prior to interview. Institutional review boards at the Division of the Social Sciences and NORC at the University of Chicago approved data collection procedures.

Measures

Thirteen outcomes are chosen, to represent mental, social, behavioral, and biological dimensions of health. To avoid feedback to marital status, all outcomes are restricted to current states. Thus, for instance, biological health is proxied by direct measures of current status, rather than lifetime diagnoses of diabetes or cardiovascular problems. Table 1 presents summary statistics for control variables, marital status categories, and outcomes by dimension of health.

Outcomes: Mental status—Two outcomes are included in this first domain of health—starting with a current *depressed* state. NSHAP depression items are derived from the Iowa form of the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1997; Shiovitz-Ezra et al., 2009), with each 4-category Likert item indexing experiences over the preceding week of one of 11 depressive states. Those with scores above 8.8 are categorized as depressed (Zauszniewski & Graham, 2009). Next, more generalized negative affect is proxied through a dummy variable, based on participant self-ratings, for “usually” or “sometimes” being *unhappy*.

Outcomes: Social ties—Two attributes of a participant’s egocentric social network tap deficits in support. These measures are based on nominations of alters during the network-roster portion of the face-to-face interview (Cornwell, Laumann, & Schumm, 2008). (The exact question wording is as follows: “From time to time, most people discuss things that are important to them with others. For example, these may include good or bad things that happen to you, problems you are having, or important concerns you may have. Looking back over the last 12 months, who are the people with whom you most often discussed things that were important to you?”). First, a participant’s *smaller network* is a simple reverse-coded count of nominated network alters, and runs from 1 (5 or more) to 6 (no alters). Next, *less close ties* indicates a participant’s average (self-reported) lack of closeness with his/her alters—ranging from 1 to 4, with higher values denoting weaker relationships.

Outcomes: Health behaviors—This set of outcomes indexes negative behavioral sequelae of spousal loss—starting with a dummy indicator for *poor sleep* habits, based on self-reports of “usually” sleeping less than 7 or more than 9 hours a night. Physical *inactivity* is indicated by one’s self-reported frequency of participation—on a regular basis—in activities such as walking, dancing, gardening, physical exercise or sports. This ordinal variable ranges from 1 (3 or more times per week) to 5 (never). Next, epidemiological studies suggest underreports of smoking in large-sample surveys, especially among women (Fisher et al., 2008). Hence, a participant’s smoking habits are measured through his/her cotinine levels (Drum et al., 2009). Cotinine is a metabolite of nicotine, derived from saliva samples taken during the biomeasure collection portion of the interview. Based on the Wells-Stewart method (Wells, 1993), participants with cotinine greater than 100 ng/ml are classified as regular *smokers*. Finally, *binge drinking* indicates the number of days in the

preceding three months a participant has had four or more drinks on one occasion, and runs from 0 (none) to 2 (two or more).

Outcomes: Biological status—These pathologies are indexed, first, by abdominal *obesity*—indicated by waist size (in inches). *Poor blood sugar* control is indicated by Hemoglobin A1c (HbA1c)—glycosylated hemoglobin as a percentage of total hemoglobin. HbA1c is derived from dried blood spots collected from capillary finger-sticks (Williams & McDade, 2009), and measures plasma glucose concentration, with higher levels indicating worse blood sugar control. Due to heavy right skew, raw HbA1c values are log-transformed in analyses. Finally, poor cardiovascular health is indexed by three measures—*systolic* and *diastolic BP* (blood pressure, in mm Hg), and *heart rate* (in beats per minute)—with each indicator representing the mean of two successive readings.

Predictors—Marital status is indexed by dummy variables for *divorced/separated*, and *widowed*, with *married/cohabiting* as the reference category. 96% of women and 98% of men in the reference group are married. The same reference category applies to partner loss duration—the included categories for which are *5 years* (since divorce, separation, or widowhood), *5-10 years*, and *10+ years*.

Control variables—A respondent's *age* is entered linearly as a continuous variable in all analyses. Gender-combined models also include a dummy variable for being *female*. Education—proxying both greater knowledge or awareness of health issues, and socioeconomic status—is similarly indexed by dichotomous indicators for *high school*, *some college*, and *bachelors or more*, with *less than high school* as the reference. While NSHAP data include a participant's self-reported net household assets in the preceding year, this factor is not included as a control variable due to missing data problems. About 12% of NSHAP respondents refused to answer this set of sensitive questions. Moreover, current financial worth is perhaps too susceptible to feedback from health—especially among older adults, with increasing health care expenses (Kington & Smith, 1997). Next, race or ethnicity is indicated by a set of dummy variables for *black* and *hispanic/other*, with *non-hispanic white* as the reference category. Seventy-seven percent of women and 70% of men in the hispanic/other category are non-black hispanics, with the remainder comprised of American Indians or Alaskan natives, Asian or Pacific Islanders, and “other.” Current religious affiliation is similarly operationalized through dummy indicators for *atheist*, *other christian*, *catholic*, and *jewish/other*, with *mainstream protestant* as the reference group. Solely for this variable, and to avoid inappropriate data loss, 15 missing cases are assigned to the reference category. A final control variable is a participant's lifetime *number of marriages*—ranging from 1 to 3-or-more.

Missing data—Due to NSHAP's randomized modularization approach to biomarker collection, smoking status (from salivary cotinine), and poor blood sugar (from blood spots), are unmeasured for some participants. NSHAP developed this protocol to reduce respondent burden while still obtaining population-representative data (O'Muircheartaigh & Smith, 2007). A subsample of 2,494 participants was assigned to this module, with an unweighted final response rate of 82.1%, including losses due to technical difficulties (Williams & McDade, 2009). However, given the modularization logic, these cases are Missing-At-Random, and hence (by design) do not compromise generalizability. Accordingly, no values are imputed.

Analytic strategy

Given the theoretical focus of this study, all analysis is restricted to those married at least once. To reduce the likelihood of possible feedback from current health status to marital

dissolution, those divorced/separated less than 3 years (i.e., the 5th percentile for all participants) are also excluded. (As noted, all outcomes are restricted to current states, for the same reason.) All models control a participant's age, education, race/ethnicity, religion, and lifetime number of marriages. Combined-gender models also control a participant's gender. While it is desirable to control time since loss in models examining marital status differentials, this variable does not apply to the reference category (currently married/cohabiting)—and is hence only examined separately.

The two study questions are sequentially targeted. First, linkages of marital status with the 13 mental, social, behavioral, and biological outcomes are examined—for all participants together, and also separately by gender (Table 2). As the last section makes clear, this disparate set of outcomes includes continuous, ordinal, as well as dummy variables. Accordingly, results are from OLS, ordinal logit, and logistic regression models respectively. To facilitate pattern-visualization, coefficients rather than Odds Ratios are presented for categorical outcomes. Next, associations of time since spousal loss with all 13 outcomes are tested through gender-combined models (Table 3). As noted, the number of years since any loss is recategorized into dummy indicators for 5 years, 5-10 years, and 10+ years—with those currently married or cohabiting as the reference group. Time since divorce/separation and widowhood is combined, to avoid loss of power from small cell sizes. Gender-specific models are avoided for the same reason.

All analyses are conducted with the STATA 12.1 statistical package (Stata Corp., 2011). Results are weighted using *svy* methods, first using population weights that adjust for the intentional oversampling of blacks and hispanics, and also incorporate a non-response adjustment based on age and urbanicity (O'Muircheartaigh & Smith, 2007). Standard errors are adjusted for sample stratification (sampling strata independently) and clustering (sampling individuals within each of 100 primary sampling units).

RESULTS

Dimensions of health

Results for marital status differentials are largely consistent with arguments about multi-dimensional effects of loss (Table 2). Among participants of both genders combined, all 13 mental, social, behavioral, and biological outcomes are significantly worse among those widowed than those currently married or cohabiting. While results are somewhat less consistent for those divorced/separated, at least one specific outcome from each dimension is worse among these participants. These include both indicators of emotional health (depression, unhappiness); less close social ties; both passive (poor sleep habits) and active (regular smoking, binge drinking) unhealthy behaviors; and two indicators of poor cardiovascular health (higher systolic BP and heart rate). Moreover, the remaining non-significant associations are almost uniformly positive in direction—with the lack of significance possibly due to smaller cell sizes for those divorced/separated (Table 1). While some linkages (smoking, binge drinking) may possibly indicate underlying propensities or lifestyle choices associated with divorce/separation—i.e., may be confounded by the latter—that these associations also occur for those widowed arguably makes stress-induced weathering mechanisms more likely.

Gender-specific results are similarly consistent with expectations (Table 2). While smaller cell sizes allow fewer associations to reach significance, those that do are uniformly positive. Separate Wald tests reveal few significant gender differentials in effects—especially for emotional and social status. However, negative behaviors—both passive (inactivity among those divorced/separated) and actively risky (smoking, binge drinking)—are more consistently likely among men than women losing a spouse. Moreover, at least two

of these associations (inactivity, binge drinking among those widowed) show significant gender differentials. Biological outcomes, however, are more uniformly worse among women with spousal loss—with abdominal fat significantly higher among those with any loss, blood sugar control worse among those widowed, and cardiovascular health (systolic BP, heart rate) worse among those divorced/separated. In contrast, only one such outcome—heart rate—is higher among widowed than married/cohabiting men.

Time since loss

As noted, the second study question—potential attenuation of effects with time since spousal loss—is operationalized through gender-combined models for 5 years, 5-10 years, and 10+ years of loss, with currently married/cohabiting as the reference. Results (Table 3) are weakest for the middle category—those 5-10 years since the event—arguably due to smaller cell sizes (Table 1). Of the other two included categories—and contrary to arguments about transient loss effects—outcomes are most consistently worse for those with long term loss (10+ years), with only one of the 13 outcomes (inactivity) not significantly higher among these participants than those currently married/cohabiting. Moreover, as expected, the potentially chronic biological conditions, that may take time to develop, are worse only with long term loss—with at least two of these associations (blood sugar, heart rate) significantly different than for those within 5 years of the event. In contrast, less than half the outcomes (5 out of 13) are worse among this latter group. However, these short term effects are particularly strong for emotional health. Not only are both emotional indicators (depression, unhappiness) significantly worse in this group than among those married/cohabiting, but (as per Wald tests) these associations are significantly different than for those with 10+ years of loss.

DISCUSSION

This study began with a conception of spousal loss as a major turning point in late life, entraining a person in a stress-induced weathering process involving mental, social, behavioral, and (hence) biological problems. Accordingly, data from a nationally-representative U.S. survey of older adults were used to examine two questions: (1) the linkage of spousal loss with these multidimensional outcomes; and (2) potential attenuation of effects with time since loss.

With regard to multidimensionality of effects, it was argued that while the literature remains predominantly focused on the emotional consequences of spousal loss, recent studies suggest mechanisms also leading to deficits in stress-buffering social support; to both passive and actively negative health behaviors; and to biological problems. Results (Table 2) were generally consistent with these conjectures, with combined-gender models revealing strong associations of widowhood with all 13 mental, social, behavioral, and biological outcomes—and of divorce/separation with at least one outcome from each dimension. Contrary to previous small-sample findings of men's greater emotional vulnerability to loss, gender specific models (Table 2) suggested no significant male-female differentials in these effects, or in social deficits. However, men losing a spouse did have more uniformly negative behaviors, possibly suggesting their stronger behavioral response to stress-processes. Intriguingly, despite these psychosocial and behavioral patterns, it was *women's* biological factors that were more consistently linked to their spousal loss—suggesting their greater physiological vulnerability to this weathering event. Next, it was noted that the literature is ambiguous on possible attenuation of spousal loss effects over time—with some studies conceptualizing loss as a traumatic *event* with short-term effects; and others focused more on the dyadic and social deficits of a partner-less *state* leading potentially to lasting health issues. Accordingly, models were run for those 5 years or less, 5-10 years, and more than 10 years from loss, with those currently married/cohabiting as the reference. Results

(Table 3) were largely consistent with enduring rather than transient loss effects—with mental, social, behavioral as well as biological outcomes almost uniformly worse among those with long-term loss (10+ years) than among those currently partnered. In other words, the findings suggest that the loss of a spouse has lasting effects on multiple dimensions of health—risks that remain elevated even among those long past the event. Moreover, it was long term loss that was most consistently associated with biological problems, consistent with a prolonged, cumulative weathering process. In contrast, less than half the outcomes were worse among those within 5 years of the event than among those with partners—although, consistent with short term trauma, it was this group that was most likely to have emotional problems (depression, unhappiness). In other words, these results suggest that previous findings of transient loss effects may have been driven by a delimited focus on a small set of emotional sequelae (Booth & Amato, 1991; Hetherington & Kelly, 2002).

Overall, this study provides important new information on the linkages of spousal loss with a broad range of mental, social, behavioral, and biological problems in late life—as well as time patterns in effects. However, it also has several limitations. First, a large literature on “role transitions” suggests that chronic stress in a prior social position may lower the psychological costs of exit (Wheaton, 1990, 1999). Thus, for instance, widowed (Carr et al., 2000; Wheaton, 1990) or divorced (Amato & Hohmann-Marriott, 2007; Kalmijn & Monden, 2006) individuals with poor pre-loss marital quality may experience *improved* mental health in the event’s aftermath—processes that could not be examined with these data. Next, cell-size limitations precluded separate analysis of those divorced/separated and those widowed, or gender-specific models, in Table 3. It is acknowledged that the time-patterns examined may vary across these categories. Similarly, cut-points for time since loss were chosen to avoid unstable estimates due to sparse cells, and may have blinded the analyses to more nuanced inflections in effects, such as those in the immediate aftermath of the transition. This is especially true given that, as noted, those divorced/separated less than 3 years were excluded, to reduce the likelihood of feedback from current health to marital dissolution. More generally, in the overall sample, 59% of those losing a spouse had experienced the event 10 or more years ago (Table 1)—limiting the study’s potential for detecting short-term patterns. Next, inclusion of “hispanic” and “other” participants as a single ethnic category may have led to inadequate adjustment of potentially different confounding of associations by these two groups, relative to those white. Moreover, partnership-health linkages may well vary across these ethnic categories—patterns that could not be examined in the current study due to sample-size limitations. In the absence of direct indicators, most behavioral as well as social outcomes had to be crudely proxied through self-reports—leading to potential bias from marital patterns in reporting. Similarly, while network size was indexed by a single interval measure, it is acknowledged that social assets may differ qualitatively for those at different levels of this indicator—such as those with no versus those with at least one tie. Most importantly, these were cross-sectional data, making it difficult to establish causal precedence, and segregate feedback effects. In particular, despite exclusion of those divorced/separated less than 3 years from all analysis, and restriction of all outcomes to current states, there remains the potential for residual feedback from health outcomes—for instance, through lower remarriage rates among unpartnered individuals in worse health. In separate analysis (not shown), however, estimates in Table 2 remained stable even when number of diagnosed health conditions (lifetime) were controlled. Moreover, a range of studies report low and declining overall remarriage rates among older adults (Cooney & Dunne, 2001; Lee, DeMaris, Bavin, & Sullivan, 2001), along with a lower desire for and more constraints on repartnering (Carr, 2004; Sweeney, 2010)—suggesting perhaps that non-selection into remarriage may not be a major factor behind the reported linkages. This is especially true for older women, for whom remarriage rates may be as low as 2% (Smith, Zick, & Duncan, 1991). Among all NSHAP participants over age 60, only 5.1% of men and 2.0% of women had initiated a marriage since that age, also consistent with a low baseline

incidence of new partnerships in late life. Similarly, while health or behavioral issues could possibly increase the likelihood of marital dissolution, the fact that associations were largely consistent across divorce/separation as well as widowhood suggests a lower likelihood of such endogeneity. To the extent that these measures indexed long-term or pre-loss problems, however, inferences on their induction by this life transition remain tentative. Next, endogeneity concerns also made it impossible to examine linkages between mental, social, behavioral, and biological conditions—conceptualized as sequential steps in a cumulative weathering process. In other words, these factors potentially interact over the life trajectory, with each other and with marital transitions, possibly producing multiple feedback loops. Cross-sectional analysis of this complex process may thus yield flawed causal inferences. Longitudinal data are crucial in resolving remaining ambiguities, and establishing mediatory pathways. In particular, the puzzling gender discrepancy with behavioral and biological outcomes—with the latter conditions more consistently linked to women than men losing a spouse, despite the reverse gender pattern holding for (potentially causally antecedent) negative behaviors—calls for deeper exploration. No current large-sample longitudinal surveys of late life offer the required combination of social and biological data. However, several—including NSHAP—are developing future waves that will enable more detailed exploration of these issues. The present study should thus be seen as a broad analysis that establishes baseline linkages and lays the groundwork for deeper examination.

CONCLUSION

Results from a nationally representative study of older U.S. adults suggest that the loss of a spouse is associated with problems in a multidimensional system of health—involving not simply emotional but also social, behavioral, and biological issues. Additionally, it is older women's rather than men's spousal loss that is more linked to their biological problems, consistent with women's greater physiological vulnerability to this life transition. Moreover, while the purely emotional trauma of the event seems to partially subside with time, the same is not true for a range of other outcomes—which remain worse even among individuals a decade or more past the event, than those with current partners. This is particularly true for adverse biological states—with these potentially chronic issues, that may take time to develop, consistently worse only among those with long-term loss.

Overall, these findings support the notion of spousal loss as a nodal point in late life health careers. More generally, the breadth of loss-effects suggests pathways through which traumatic life events may find their way “under the skin,” and have biological repercussions—linkages that await more intensive longitudinal analysis.

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Table 1

Descriptive Statistics for Variables Used in Analyses.

Control variables													
Education				Race/ethnicity				Religion					
Age ^a	Gender (female) ^b	Less than high school ^b	High school ^b	Some college ^b	Bachelors or more ^b	White ^b	Black ^b	Hispanic/ other ^b	Mainstream Protestant ^b	Atheist ^b	Other Christian ^b		
Mean	68.04	0.18	0.27	0.30	0.24	0.81	0.10	0.09	0.51	0.07	0.10		
(SE)	(0.20)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	0.00	(0.02)		
N	2885	2885	2885	2885	2885	2873	2873	2873	2885	2885	2885		
Dependent variables													
Control variables				Independent variables				Dependent variables					
Religion		Marital status		Partner loss duration				Mental status					
Catholic ^b	Jewish/ other ^b	Number of marriages ^c	Married/ Cohabiting ^b	Divorced/ separated ^b	Widowed ^b	5 years ^b	5-10 years ^b	10+ years ^b	Depressed ^b	Unhappy ^b			
Mean	0.28	1.39	0.71	0.12	0.17	0.27	0.14	0.59	0.22	0.09			
(SE)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)	0.01	(0.02)	(0.01)	(0.01)			
N	2885	2840	2885	2885	2885	1024	1024	1024	2837	2876			
Dependent variables													
Social ties				Health behaviors				Biological status					
Smaller network ^c	Less close ties ^a	Poor sleep ^b	Inactivity ^c	Smoker ^b	Binge drinking ^c	Obesity ^a	Poor blood sugar ^a	Systolic BP ^a	Diastolic BP ^a	Heart rate ^a			
Mean	2.50	1.84	1.82	0.18	0.24	38.41	1.79	136.26	81.05	70.96			
(SE)	(0.05)	(0.01)	(0.03)	(0.01)	(0.02)	(0.18)	0.00	(0.46)	(0.32)	(0.36)			
N	2885	2815	2880	2175	2866	2788	1675	2817	2817	2814			

Note: All analyses restricted to those married at least once. Italicization denotes reference category in subsequent analyses. All estimates are weighted to account for differential probabilities of selection and differential nonresponse. Design-based standard errors are given in parentheses.

^aContinuous variable.
^bDummy variable.
^cOrdinal variable.

Table 2
Associations of Marital Status with Health Dimensions among U. S. Adults Aged 57-85: Coefficients (Standard Errors).

	Mental status		Social ties		Health behaviors			Biological status					
	Depressed ^b	Unhappy ^b	Smaller network ^c	Less close ties ^d	Poor sleep ^b	Inactivity ^c	Smoker ^b	Binge drinking ^c	Obesity ^d	Poor blood sugar ^d	Systolic Bpd	Diastolic Bpd	Heart rate ^d
Marital status (ref: married/cohabiting)													
ALL ^a													
Divorced/separated	0.37 * (0.14)	1.13 ** (0.19)	0.23 (0.14)	0.12 ** (0.04)	0.45 ** (0.16)	0.13 (0.13)	0.65 ** (0.21)	0.49 * (0.19)	0.54 (0.43)	0.00 (0.02)	3.58 * (1.67)	0.78 (0.78)	1.87 * (0.82)
Widowed	0.62 ** (0.10)	1.08 ** (0.21)	0.23 * (0.09)	0.06 * (0.03)	0.41 ** (0.12)	0.26 * (0.11)	0.46 * (0.22)	0.32 + (0.19)	1.15 ** (0.33)	0.02 * (0.01)	2.70 * (1.11)	1.18 + (0.70)	2.39 ** (0.72)
N	2782	2819	2828	2762	2808	2823	2132	2810	2731	1648	2761	2761	2758
WOMEN													
Divorced/separated	0.20 (0.20)	1.29 ** (0.28)	0.16 (0.17)	0.12 * (0.06)	0.52 * (0.26)	-0.08 (0.15)	0.70 + (0.38)	0.13 (0.40)	0.94 + (0.52)	0.02 (0.02)	4.81 * (2.36)	1.06 (1.26)	2.34 * (1.05)
Widowed	0.58 ** (0.14)	1.22 ** (0.29)	0.29 ** (0.10)	0.05 (0.03)	0.43 * (0.17)	0.15 (0.13)	0.19 (0.31)	-0.11 (0.32)	1.75 ** ^ (0.36)	0.03 * (0.01)	2.29 (1.69)	0.90 (0.93)	0.92 (1.03)
N	1422	1446	1452	1430	1437	1449	1008	1443	1394	847	1415	1415	1414
MEN													
Divorced/separated	0.61 * (0.27)	0.91 ** (0.29)	0.36 (0.23)	0.11 (0.06)	0.35 + (0.20)	0.48 + ^ (0.25)	0.64 * (0.29)	0.69 ** (0.22)	-0.02 (0.62)	-0.02 (0.03)	1.49 (2.41)	0.35 (1.13)	0.74 (1.23)
Widowed	0.68 ** (0.19)	1.03 ** (0.23)	-0.02 (0.19)	0.07 (0.05)	0.39 + (0.20)	0.30 (0.25)	0.74 * (0.32)	0.71 ** ^ (0.26)	-0.39 (0.58)	0.02 (0.02)	2.35 (2.00)	0.39 (1.36)	4.16 ** ^ (1.21)
N	1360	1373	1376	1332	1371	1374	1124	1367	1337	801	1346	1346	1344

Note: All analyses restricted to those married at least once. All models control a participant's age, education, race/ethnicity, religion, and number of marriages (lifetime). All estimates are weighted to account for differential probabilities of selection and differential nonresponse. Design-based standard errors are given in parentheses.

^aGender controlled.

^bDummy outcome. Results are from logit models.

^cOrdinal outcome. Results are from ordinal logit models.

Das

^d Continuous outcome. Results are from OLS models.

⁺ $p < .10$;

^{*} $p < .05$;

^{**} $p < .01$.

[^] Effect significantly different at $p < .10$ than in equivalent model for other gender, per Wald test.

Table 3
Associations of Partner-Loss Duration with Health Dimensions among U. S. Adults Aged 57-85: Coefficients (Standard Errors).

	Mental status		Social ties		Health behaviors				Biological status				
	Depressed ^a	Unhappy ^a	Smaller network ^b	Less close ties ^c	Poor sleep ^a	Inactivity ^b	Smoker ^a	Binge drinking ^b	Obesity ^c	Poor blood sugar ^c	Systolic Bp ^c	Diastolic Bp ^c	Heart rate ^c
Marital status (ref: married/cohabiting)													
Partner loss 5 yrs	0.91 ^{** ^}	1.53 ^{** ^}	0.04	0.04	0.44 ^{**}	0.16	0.36 [*]	0.52 [*]	0.35	0.00	2.40	0.57	0.80
	(0.13)	(0.23)	(0.14)	(0.04)	(0.15)	(0.17)	(0.17)	(0.25)	(0.44)	(0.01)	(1.55)	(1.01)	(0.83)
Partner loss 5-10 yrs	0.16	1.11 ^{**}	0.09	0.12 [*]	0.11	0.41 ⁺	0.59 ⁺	-0.65 ⁺	1.05 ⁺	0.02	0.52	0.47	3.01 ^{**}
	(0.19)	(0.35)	(0.20)	(0.06)	(0.24)	(0.23)	(0.34)	(0.38)	(0.55)	(0.02)	(2.02)	(1.23)	(1.11)
Partner loss 10 yrs	0.37 ^{**}	0.82 ^{**}	0.37 ^{** ^}	0.11 ^{** ^}	0.49 ^{**}	0.17	0.66 ^{**}	0.52 ^{**}	1.11 ^{**}	0.02 ^{+ ^}	4.05 ^{**}	1.36 [*]	2.66 ^{** ^}
	(0.11)	(0.19)	(0.13)	(0.03)	(0.14)	(0.14)	(0.18)	(0.18)	(0.36)	(0.01)	(1.32)	(0.67)	(0.85)
N	2782	2819	2828	2762	2808	2823	2132	2810	2731	1648	2761	2761	2758

Note: All analyses restricted to those married at least once. All models control a participant's age, gender, education, race/ethnicity, religion, and number of marriages (lifetime). All estimates are weighted to account for differential probabilities of selection and differential nonresponse. Design-based standard errors are given in parentheses.

^aDummy outcome. Results are from logit models.

^bOrdinal outcome. Results are from ordinal logit models.

^cContinuous outcome. Results are from OLS models.

⁺ $p < .10$;

^{*} $p < .05$;

^{**} $p < .01$.

[^] Effect significantly different at $p < .10$ than for other extreme of partner loss duration, per Wald test.