

Daily Emotional and Physical Reactivity to Stressors Among Widowed and Married Older Adults

Elizabeth A. Hahn,¹ Kelly E. Cichy,² Brent J. Small,³ and David M. Almeida⁴

¹Department of Psychology, Brandeis University, Waltham, Massachusetts.

²Human Development & Family Studies, Kent State University, Ohio.

³School of Aging Studies, University of South Florida, Tampa, Florida.

⁴Human Development & Family Studies, Pennsylvania State University, State College, Pennsylvania.

Objectives. Widowhood may result in declines in health and potentially stressful changes to daily routines. However, little research has examined how daily stressors contribute to physical and emotional well-being in widowhood. The objectives of the current study were to examine daily stressor exposure and reactivity in widowed versus married older adults.

Method. Participants included all 100 widowed and 342 married adults aged 65 and older from the National Study of Daily Experiences, a daily diary study from the second wave of the Midlife in the United States. Daily stressors were measured using the Daily Inventory of Stressful Events; multilevel modeling assessed daily reactivity to stressors using daily negative affect (emotional reactivity) and daily physical symptoms (physical reactivity) as outcomes.

Results. Married participants reported more stressors in general, and specifically more interpersonal stressors (e.g., arguments). Both married and widowed participants were reactive to daily stressors. Married participants were physically and emotionally reactive to interpersonal stressors. Widowed participants were more physically reactive to home-related stressors.

Discussion. Attention to the types of daily stressors that widowed older adults experience in daily life and the potential physical effects of daily stressors during widowhood may help to alleviate some of the physical distress that widowed older adults may experience.

Key Words: Stress—Well-being—Widowhood—Daily diary.

WIDOWHOOD is a common and stressful life event, which is likely to be accompanied by changes in all aspects of daily life, and for some widows(er)s who have recently experienced bereavement, a decline in mental and physical health (Wilcox et al., 2003). Compared with their married counterparts, widowed older adults have increased risk of mortality and morbidity (Stroebe, Schut, & Stroebe, 2007). In addition, widowed older adults, compared with married older adults, have, on average, a 44% lower economic status (McGarry & Schoeni, 2005). Declines in physical and mental health and disruptions to finances may collectively result in distress for widowed older adults that may potentially compromise long-term health and well-being. Much of the widowhood research has examined the well-being of widowed older adults using mainly clinical or retrospective global measures of well-being, and less is known about how this distressing life event may give rise to other types of stressful experiences, such as subtle day-to-day stressors or hassles.

Daily hassles are the minor, frequently occurring challenges of daily life, such as household chores or having a disagreement with a family member (Almeida, 2005; Bolger, DeLongis, Kessler, & Schilling, 1989; McIntyre, 2008) that have immediate, direct effects on health and

well-being (Bolger, Davis, & Rafaeli, 2003). The chronic experience of stress, such as that which may occur in response to continued daily stress within the context of widowhood may lead to increased proinflammatory cytokines (Kiecolt-Glaser, McGuire, Robles, & Glaser, 2002) and an overactivation and dysregulation of the body's stress response that may result in a decreased ability to respond to stress and potentially negative health outcomes (Finch & Seeman, 1999). Previous research indicates that individuals who experience repeated exposure to stress (e.g., caregivers) or stressful life events have an increased risk of worse physical and emotional health (Nolen-Hoeksema & Ahrens, 2002; Pinquart & Sörensen, 2003). Furthermore, it has also been suggested that disruption to daily activities may be a possible mechanism by which older adults with increased genetic, biological, or environmental risk of depression experience depressive symptoms (Fiske, Wetherell, & Gatz, 2009). Over time, widowhood may require adjustment to new and different routines, identities, and roles compared with previously established routines, daily activities, or personal identity (Naef, Ward, Mahrer-Imhof, & Grande, 2012).

The dual process coping model posits that bereavement involves not only adjustment and coping with the emotional

loss of the spouse (loss-orientated coping) but also adjustment to the changes in roles, responsibilities, and daily routines after the death of the spouse (restoration-oriented coping; [Stroebe & Schut, 1999](#)). Restoration-oriented coping has been found to be more common a year or more after the death of the spouse and has been associated with positive outcomes, such as self-reported personal growth and increased daily living skills ([Caserta & Lund, 2007](#)). [Caserta and Lund \(2007\)](#) expanded on the dual process model by incorporating the measurement of loss-orientated and restoration-oriented coping in the Inventory of Daily Widowed Life, which includes 22 items of daily life activities assessed retrospectively during the past week, including visiting with friends or relatives, engaging in volunteer or work activities, and managing household responsibilities. Research is needed to prospectively examine naturally occurring daily experiences among widowhood to better understand whether the long-term changes in daily experiences as a result of widowhood are related to differential exposure to stressors. Furthermore, research is also needed to better understand how the potentially different frequency and type of stressors that widowed older adults experience may be associated with physical and emotional well-being as a potential explanatory mechanism for increased distress in widowed older adults. The current study aimed to further contribute to this research and address some of the gaps in the literature by examining widowed older adults' adjustment to daily life. The current study used a daily diary approach to examine the potential role of daily stressors in relation to physical and emotional well-being by examining differences in the daily stress process between married and widowed older adults. Advantages of the daily diary approach include the measurement of events and experiences that "meaningfully" vary over a short period of time and the ability to explain the short-term variability in individuals ([Affleck, Zautra, Tennen, & Armeli, 1999](#); [Bolger et al., 1989](#)).

The daily stress process model incorporates both the measurement of stressors and their effects on health as well as the likelihood that these concepts will vary within the short term in individuals. The daily stress process considers both the likelihood that an individual will encounter a stressor (i.e., stressor exposure) and an individual's emotional, physiological, or behavioral response to that stressor (i.e., stressor reactivity; [Almeida, 2005](#); [Bolger & Zuckerman, 1995](#)). Using this daily stress process model, past research has identified that individuals report more physical symptoms and higher negative affect ([Almeida, 2005](#)) when they experience more daily stressors. The model also incorporates the measurement of characteristics of stressors (e.g., stressor content) as well as resilience and risk factors (e.g., bereavement or health factors; [Almeida, 2005](#)). In order to better understand the possible mechanisms of distress and inform intervention and supportive services for widowed older adults, the model emphasizes the importance of not

only examining stressors as a whole but also of examining specific types of daily stressors (e.g., stressors at home, conflict with relative or friend) that may be related to worse outcomes ([Almeida, 2005](#); [Dohrenwend, 2006](#)).

Marital Status and Daily Stressor Exposure

Widowhood is a risk factor that may result in significant changes to everyday life and increased exposure to stressful or negative daily experiences. Previous research has found that men report an increase in the number of hours spent doing housework activities after the loss of their spouse ([Utz, Reidy, Carr, Nesse, & Wortman, 2004](#)). For older adults who may have relied on their spouse for daily tasks or who are not proficient in completing those tasks, different routines may be particularly distressing after their spouses' death ([Carr et al., 2000](#); [Carr & Utz, 2001](#)). [Caserta and Lund's \(2007\)](#) Inventory of Daily Widowed Life identifies other possible disruptions or changes to daily life following widowhood, including "learning to do new things," "dealing with financial matters," and "finding ways to keep busy or occupied." Previous research has also identified greater daily exchanges of support with friends or relatives among widowed older adults compared with married older adults that may be due to changes in household responsibilities ([Hahn, Cichy, Almeida, & Haley, 2011](#)). As a result, relationships with friends and relatives may be particularly important for widowed older adults ([Ha & Ingersoll-Dayton, 2011](#)). Supportive relationships with family and friends help with widowed older adults' adjustment ([Utz, Carr, Nesse, & Wortman, 2002](#)); however, increased contact with family and friends also present opportunities to experience stressful interpersonal events, such as arguments or disagreements. Despite the possible changes to daily routines, research has yet to examine whether widowhood is associated with greater exposure to daily stressors and whether different types of stressors, such as household responsibilities or interpersonal stressors, occur more frequently among widowed adults compared with their married counterparts.

Marital Status and Daily Stressor Reactivity

Reactivity in daily life may be a marker of the effect of stressors on health and well-being. Previous research examining reactivity to daily stressors has examined both physical and emotional reactivity to stressors (i.e., daily affect and physical symptoms; [Affleck, Tennen, Urrows, & Higgins, 1994](#); [Birditt, Cichy, & Almeida, 2011](#)). Daily stressors have been associated with higher daily negative affect among older adults ([Mroczek & Almeida, 2004](#); [Sliwinski, Almeida, Smyth, & Stawski, 2009](#)). However, other research has found similar emotional reactivity to stressors among older and younger adults ([Stawski, Sliwinski, Almeida, & Smyth, 2008](#)) or lower emotional reactivity among older compared with younger adults ([Neupert, Almeida, & Charles, 2007](#)). Research that investigates differences in emotional reactivity as a

function of marital status may help to inform the current state of research on emotional reactivity among older adults. Increased risk of morbidity and decreased financial resources during bereavement may alter widowed older adults' capacity to respond to stressors over time, possibly resulting in decreased resilience. Previous research suggests that widowed older adults may experience physical effects of stressors as evidenced by increased heart rate and increased heart rate variability compared with depressed and nonrecently bereaved participants (O'Connor, Allen, & Kaszniak, 2002).

Stressors may not only affect physical health but daily stressors may also affect emotional health. Emotion regulation, such as in the context of coping with daily stressors, has been identified as an important risk factor for bereavement outcomes (Stroebe & Schut, 1999). Arguably, the chronic concerns widowed older adults face, such as financial hardship, may exhaust their coping resources, leaving them more vulnerable than their married counterparts to the negative effects of daily hassles, such as an argument with a friend or an unexpected problem at home. Despite the evidence suggesting possible increased physical reactivity in widowed older adults and the importance of daily emotional well-being for long-term outcomes, research is limited that examines both emotional and physical reactivity to daily stressors among widowed older adults.

Current Study

Our study examined both within-person (WP) and between-person (BP) differences in responses to daily stressors in widowed and married older adults. In other words, analyses were conducted that examined how individuals compare with themselves (WP effects or intraindividual variability) and how they compare with others (BP effects or interindividual variability). The WP analyses examined whether an outcome (e.g., daily negative affect) is significantly associated with increased stressors compared with that person's typical level of stressors. The BP analyses examined whether individuals who experience more stress, on average, have higher daily negative affect.

The current study has four specific research hypotheses. First, widowed participants will experience a greater number of daily stressors compared with married participants (Hypothesis 1). Second, participants will report higher daily negative affect and more physical symptoms on stressor days than on nonstressor days (WP stressor effect; Hypothesis 2). Third, participants who experience more stressors, in general, will have greater negative affect and a greater number of physical symptoms compared with participants who experience fewer stressors, in general (BP stressor effect; Hypothesis 3). Fourth, we examined the extent to which marital status (i.e., married vs. widowed) moderated both WP and BP effects of daily stressors. We

hypothesized that widowed participants would experience greater emotional and physical reactivity to daily stressors compared with their married counterparts (Hypothesis 4).

METHOD

Procedure and Sample

Respondents are from the second wave of the National Study of Daily Experiences (NSDE II; Almeida, McGonagle, & King, 2009). NSDE II is one of the in-depth satellite studies of the second wave of the Midlife in the United States Survey (MIDUS II), a nationally representative telephone-mail survey study of 4,963 people aged 35–86 years (Keyes & Ryff, 1998; Lachman & Weaver, 1998; Mroczek & Kolarz, 1998). The 2,022 respondents involved in the NSDE II study were randomly selected from the larger MIDUS II study, and the response rate for the NSDE II sample was 86%. As part of NSDE II data collection, participants completed up to eight daily interviews once a day for eight consecutive days. On average, married participants aged 65 and older in the current study completed 7.6 out of 8 interviews and widowed participants completed on average 7.4 interviews out of 8 compared with an average of 7.2 out of 8 interviews in the larger NSDE sample. Chi-square analyses revealed no statistically significant differences in the percentage of missed days for widowed versus married participants ($p > .05$).

The current study includes 100 widowed and 342 married participants aged 65 and older who participated in NSDE II. There was not an adequate number of single or divorced adults aged 65 and older to make a meaningful comparison, so the current study includes only married and widowed adults. Participants received \$20 for participating in the project, which consisted of nightly telephone interviews, where respondents answered questions about their day. Participants were on average, 72 years of age, half were female (54.98%), and most participants were White (92.76%). Approximately 40% had some college education. The widowed participants were significantly older, more likely to be female, and reported lower levels of education. Widowed participants had been bereaved for an average of 11 years (Table 1).

Table 1. Descriptive Information for Widowed ($n = 100$) and Married Older Adults ($n = 342$)

Variable, M (SD)	All	Widowed OAs	Married OAs	p Value
Age ^a	72.38	74.48 (5.24)	71.76 (5.21)	<.001
Gender (% female) ^a	54.98	82.00	47.08	<.001
Race (% White)	92.76	87.00	94.44	.062
Education (% some college) ^a	40.00	31.00	42.65	.034
Depressive symptoms (none)	91.18	92.00	90.94	.855
Years widowed		11.30 (8.51)		

Notes. M = mean; OAs = older adults; SD = standard deviation.

^aIndependent samples t test and chi-square analyses revealed significant differences by marital status at $p < .05$ level.

Measures

Daily stressors.—Daily stressors were measured each day using the Daily Inventory of Stressful Events (DISE; Almeida, Wethington, & Kessler, 2002). In the full DISE measure, participants were asked whether they experienced any of seven types of stressors that day. Participants reported (a) whether they experienced an argument or disagreement, (b) whether they avoided an argument or disagreement (something happened that they could have argued about but they decided to let it pass), (c) whether they experienced a work- or school-related stressor, (d) whether they experienced a home-related stressor, (e) whether they experienced discrimination, (f) whether they experienced a network stressor (something that happened to a close friend or relative), and (g) if anything else happened that was stressful for them. Participants responded yes (1) or no (0). Based on previous research, the current study incorporated four of the seven stressors that are the most commonly occurring types of stressors (Almeida, 2005) and that were believed to be relevant in the older adult widowed population, including interpersonal stressors (i.e., arguments or avoided arguments), home stressors, and network stressors. Network stressors refer to events that do not directly involve the respondent that still turn out to be stressful for the respondent, such as learning about a friend's illness. Work- or school-related stressors were excluded because of the age of the current sample (aged 65 and older), and discrimination and "any other" stressors were excluded because of their low frequency of occurring (<3.5% of days) in the NSDE sample (Almeida, 2005).

Daily negative affect.—Daily negative affect was measured using an adapted inventory of emotions from the Non-Specific Psychological Distress Scale and the Positive and Negative Affect Schedule (Kessler et al., 2002; Mroczek & Kolarz, 1998; Watson, Clark, & Tellegen, 1988). Respondents reported how often during the past day they experienced 14 different negative emotions (e.g., worthless, hopeless, and restless or fidgety) using a 5-point scale ranging from 0 (*none of the time*) to 4 (*all of the time*). Items for negative affect were summed for each day with higher scores reflecting higher negative affect, and reliability for the measure was high ($\alpha = .91$).

Daily physical symptoms.—Participants reported each day whether they experienced any of 25 physical symptoms (e.g., pain and musculoskeletal symptoms, gastrointestinal, flu and respiratory symptoms, and other physical symptoms). The number of symptoms were summed (range 0–25), and higher scores reflected a greater number of physical symptoms.

Covariates.—Descriptive variables were assessed at baseline and included the following covariates: age, education (percent with high school degree), race (White or

non-White), gender, and depressive symptoms. Time since widowhood was included as a descriptive characteristic among the widowed sample, measured continuously as the number of years since the spouse's death. Scores for depressive symptoms ranged from 0 to 7. Specifically, participants answered yes (1) or no (0) to the following seven items: "During 2 weeks in the past 12 months, when you felt sad, blue, or depressed, did you, 'lose interest in most things,' 'feel more tired out or low on energy than usual,' 'lose your appetite,' 'have more trouble falling asleep than usual,' 'have a lot more trouble concentrating than usual,' 'feel down on yourself, no good, or worthless,' or 'think a lot about death'" (Kessler, Mickelson, Walters, Zhao, & Hamilton, 2004). The number of years since widowhood was used as a covariate in the main analyses, and the average length of time since spousal death was imputed for married participants ($M = 11.30$ years).

Analytic Strategy

Stressor exposure.—First, correlations were conducted to check for multicollinearity between predictor variables. Second, chi-square analyses were run to examine differences in daily stressor exposure (stressor day vs. nonstressor day) between married and widowed participants (Hypothesis 1) for any stressors and for the specific stressor types (interpersonal stressors, home stressors, and network stressors).

Stressor reactivity.—Second, reactivity models were estimated using multilevel models (MLM) with PROC Mixed in SAS Version 9.2. Because WP and BP predictors can provide unique information about how individuals vary from their own average and how individuals vary from each other, both WP and BP predictors of the two outcome variables were estimated (Curran & Bauer, 2011). Prior to conducting analyses, an unconditional model was run to calculate the intraclass correlation coefficient to determine the proportion of WP and BP variability in both negative affect and physical symptoms. Results of the unconditional models suggest that 67% of the variability in daily physical symptoms was between participants, and 33% of the variability was within participants. For daily negative affect, 46% of the variability was BP and 54% of the variability was WP. MLM estimated the WP and BP effects of interpersonal stressors, home stressors, and network stressors as predictors of negative affect (Model 1) and number of physical health symptoms (Model 2). For the WP analyses, the stressor variable was coded as 1 for days when the participant reported a stressor and 0 for days when the person did not report a stressor, and the variable was also person-mean centered for multilevel analyses to examine how participants vary from their own average (Hypothesis 2). For the BP analyses, we aggregated the number of daily stressors over the course of 8 days for each person (Hypothesis 3).

Finally, the interactions between stressors and marital status were also entered into each model to examine the extent to which marital status moderates emotional and physical reactivity to daily stressors (Hypothesis 4). For all analyses, covariates were grand-mean centered. In both Models 1 and 2, age, gender, and education were included as covariates because there were group differences in those covariates for married and older adults. Depressive symptoms were included as a covariate because of the significant relationship with the outcome variables. Race was not included in the models because there were no significant group differences, and it was not significantly related to either outcome variable. Day of data collection (i.e., time) was included as a covariate in all models because there was a significant decrease in the reporting of physical symptoms and negative affect over the course of the 8 days of data collection.

RESULTS

Exposure to Daily Stressors by Marital Status

Contrary to our hypothesis, married participants reported experiencing “any stressor” on a greater percentage of days than widowed participants (26.8% vs. 21.0%, $p < .001$). Married participants also reported experiencing an interpersonal stressor on a significantly greater percentage of days than widowed participants (16.7% and 12.5%, $p < .001$). Both married and widowed participants reported experiencing home stressors on approximately 6% of days, and network stressors were reported on approximately 5% of days, and there were no group differences ($p > .05$).

Emotional Reactivity to Daily Stressors

Results revealed older participants and those with higher depressive symptoms at baseline were more likely to report higher daily negative affect. Time was a significant predictor of negative affect, suggesting a decrease in negative affect over the course of the daily diary collection. Results of the main analyses examining emotional reactivity to stressors suggest that after controlling for other types of stressors, interpersonal stressors were significantly predictive of higher daily negative affect at both the WP and BP levels (Table 2). The WP effect suggests that on days when individuals reported an interpersonal stressor, they reported higher negative affect compared with days when they did not experience an interpersonal stressor. The BP effect indicates that individuals who on average have more interpersonal stressors report greater negative affect. In addition, increased WP and BP home-related stressors were significant predictors of increased negative affect, and higher WP network stressors predicted higher daily negative affect. These results suggest that on days when a person reports a home-related stressor or a network stressor, they report higher negative affect compared with a day when that person does not report a home-related or network stressor. Also, people who in general report more home-related stressors also report higher negative affect.

Marital status differences.—Marital status was a significant moderator of emotional reactivity to WP interpersonal stressors. The interaction effect is illustrated in Figure 1 and shows that on days when both widowed (Estimate = 0.05, $SE = 0.02$, $p = .01$) and married adults (Estimate = 0.11, $SE = 0.01$, $p < .001$) reported an interpersonal stressor,

Table 2. Fixed Effects Estimates for Models for Any Interpersonal, Home, or Network-Related Stressors Predicting Negative Affect and Physical Symptoms

Parameter	Model 1 ^a		Model 2 ^a	
	Negative affect		Physical symptoms	
	Estimate	SE	Estimate	SE
Intercept	1.29***	0.37	2.08***	0.26
Day/time	-0.08***	0.02	-0.14***	0.01
Marital status	-0.18	0.38	0.65*	0.28
Interpersonal stressors (WP)	1.39***	0.13	0.05	0.06
Home-related stressors (WP)	1.97**	0.18	0.19*	0.08
Network stressors (WP)	0.53***	0.20	0.09	0.09
Interpersonal stressors (BP)	4.68***	0.63	1.89***	0.46
Home-related stressors (BP)	3.85***	1.01	1.50*	0.74
Network stressors (BP)	1.75	0.99	0.52	0.70
Interpersonal stressors (WP) × marital status	0.80*	0.33	-0.08	0.15
Home-related stressors (WP) × marital status	0.02	0.45	-0.43*	0.21
Network stressors (WP) × marital status	0.15	0.48	0.23	0.22
Interpersonal stressors (BP) × marital status	-2.32	1.72	-1.88	1.25
Home-related stressors (BP) × marital status	1.43	2.52	-4.18*	1.85
Network stressors (BP) × marital status	2.44	2.28	-1.71	1.64

Notes. BP = between-person; SE = standard error; WP = within-person.

^aAdjusted for age, gender, education, number of years widowed (average widowhood [$M = 11.30$ years] length is imputed for married participants), and depressive symptoms.

* $p < .05$. ** $p < .01$. *** $p < .001$.

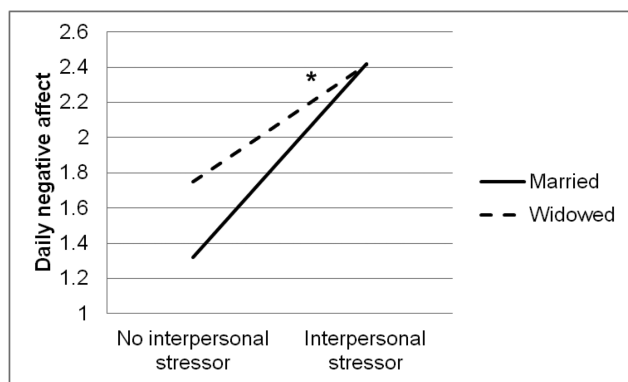


Figure 1. Marital status as a moderator of emotional reactivity to within-person interpersonal stress. $*p < .05$.

they reported higher negative affect than on a day when they did not report an interpersonal stressor; however, this effect was stronger for married adults compared with widowed participants. Figure 1 also shows that on nonstressor days, widowed participants report higher negative affect, and they are similar to married participants on interpersonal stressor days resulting in less emotional reactivity among the widowed participants from a nonstressor day to a stressor day; however, they report higher negative affect overall across nonstressor and stressor days. Marital status did not moderate emotional reactivity to other types of daily stressors.

Physical Reactivity to Daily Stressors

Results indicated that participants who were older, female, married, and had higher depressive symptoms were significantly more likely to report a greater number of daily physical symptoms. Time was also a significant predictor, suggesting a significant decrease in daily physical symptoms over the course of the week of daily diary collection.

Controlling for other types of stressors, increased home-related stressors were significant predictors of a greater number of daily physical symptoms at both the WP and BP levels (Table 2). These results indicate that on a day when a person reports a home-related stressor, they report more physical symptoms than on a day when they do not report a home-related stressor. In addition, people who in general report more home-related stressors also report more physical symptoms, on average. The BP effect of interpersonal stressors remained a significant predictor of a greater number of daily physical symptoms, suggesting that participants who, on average, report more interpersonal stressors also report a greater number of physical symptoms.

Marital status differences.—Marital status was a significant moderator of WP physical reactivity to WP home-related stressors (Figure 2). In other words, widowed participants report significant increases in physical symptoms on a day

with a home-related stressor (Estimate = 0.53, $SE = 0.18$, $p = .004$), whereas married participants do not report increased physical symptoms on days when they report a home-related stressor compared with days when they do not report a home-related stressor. Marital status did not moderate physical reactivity to the other types of daily stressors.

DISCUSSION

The current study examined widowed older adults' adjustment to daily life by examining whether daily stressor exposure and stressor reactivity varied between married and widowed adults. The results of this study suggest that (a) married participants reported more stressors in general, and in particular, more interpersonal stressors compared with widowed participants; (b) married and widowed participants were both emotionally reactive to interpersonal stressors, but married participants were significantly more emotionally reactive; and (c) widowed participants were physically reactive to home-related stressors. In support of the daily stress process model and partially in support of our hypotheses, daily stressors were associated with increased negative affect for all participants, and emotional and physical reactivity was moderated by marital status. In support of our hypothesis, widowed participants were more physically reactive to home-related stressors. In contrast, our finding of greater emotional reactivity to interpersonal stressors among married participants was unexpected.

Marital Status and Daily Stressor Exposure

Contrary to our hypothesis, married participants reported significantly more stressors, in general, and specifically married participants reported more interpersonal stressors. We also found that married participants experienced greater emotional reactivity to interpersonal stressors compared with widowed participants. Constant interaction with a spouse may put married participants at increased risk of repeated exposure to interpersonal tensions. In additional post hoc analyses examining the person with whom married

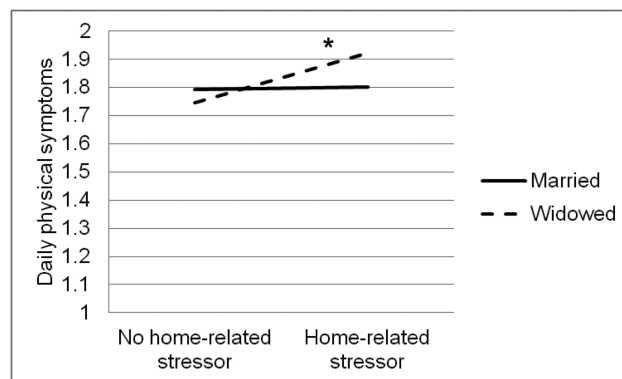


Figure 2. Marital status as a moderator of physical reactivity to within-person home-related stress. $*p < .05$.

versus widowed participants experienced interpersonal tensions, married participants reported the majority of their arguments involved their spouse (68%), whereas widowed participants reported the most arguments with “friends” or “others.” When spousal arguments are excluded from the comparison of daily stressors between married and widowed participants, the significant differences in reports of “any stressors” and “interpersonal stressors,” as illustrated in Figure 3, were reduced to nonsignificant levels ($p > .05$), suggesting that married older adults’ greater stressor exposure, particularly to interpersonal tensions, is largely attributable to married older adults’ increased opportunities to argue or disagree with their spouse.

There were no differences in exposure to network or home stressors between married and widowed participants. However, because long-term widowed older adults may have adjusted to daily life and are more likely to have more confidence in daily living skills (Caserta & Lund, 2007), incorporation of widowed participants with a range of years since widowhood may mask some variation in exposure to daily stressors among the recent widowed older adults.

Marital Status and Daily Stressor Reactivity

Unexpectedly, married participants were more emotionally reactive to interpersonal stressors than widowed participants. However, widowed participants were not immune to the negative effects of other daily stressful events as evidenced by similarity in emotional reactivity to network and home-related stressors among married and widowed older adults and higher negative affect overall on noninterpersonal stressor and interpersonal stressor days. These findings also support previous research that

finds some evidence of stability and resilience in the long term for widowed older adults (Bonanno, Moskowitz, Papa, & Folkman, 2005). Married participants, however, may be more emotionally reactive to interpersonal stressors because for married adults, these events are likely to include a spouse. In an analysis of emotional reactivity to stressors as a function of marital status excluding spousal arguments, the effects of increased emotional reactivity to interpersonal stressors among married participants are reduced to nonsignificant. These results suggest that both widowed and married participants report emotional reactivity to interpersonal stressors, and that marital status differences in emotional reactivity to interpersonal stressors are driven by spousal relations. Previous research has indicated that marital relationships may be a particularly salient relationship for older adults as illustrated by a stronger relationship between marital quality and psychological well-being among older adults compared with younger adults (Bookwala & Jacobs, 2004).

In support of our hypotheses, our findings also provide some evidence of decreased resilience in the daily lives of widowed participants. The widowed participants in our study were more physically reactive to home-related stressors. Our finding of greater physical reactivity among widowed older adults in a sample with a range of years since the loss of their spouse suggests that they may be more physically vulnerable to the changes in daily life during widowhood even after many years of adjustment to the loss of a spouse. The dual process model of coping suggests that restoration-oriented adjustment to widowhood may include coping with tasks of daily life (Caserta & Lund, 2007) and that widowed older adults may better adjust to these tasks over time. Our finding of similar exposure to

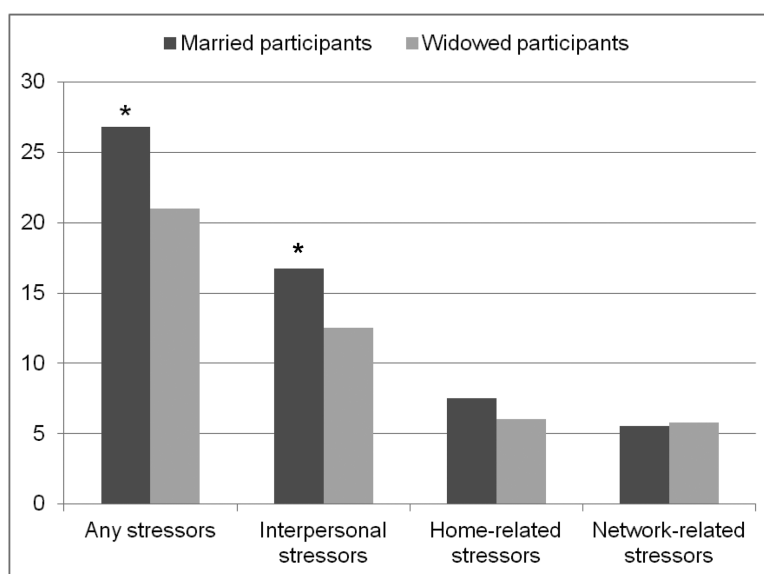


Figure 3. Percentage of days of reported stressors by marital status. *Chi-square analyses revealed significant differences by marital status at significance level of $p < .05$.

home-related stressors in widowed and married older adults despite greater physical reactivity to home-related stressors among widowed participants suggests that the changes to daily life that accompany the loss of a spouse may, in fact, have lingering effects. The daily stress process model posits that risk factors may increase vulnerability to the negative effects of stressors (Almeida, 2005), and our findings suggest that widowhood may be a possible risk factor. The differences in reactivity by stressor types also support the importance of identifying and examining different types of stressors, as suggested by the daily stress process model (Almeida, 2005). The greater physical reactivity to home-related stressors in the widowed population and greater emotional reactivity among married participants suggests that while older adults, regardless of marital status may experience reactivity, different daily routines, activities, and interactions that may vary based on marital status may be a mechanism by which adults experience differential declines in health and well-being.

The finding of significant effects in both WP and BP analyses illustrates the importance of examining both intraindividual and interindividual variations in the associations between stressors and well-being. The intraindividual variations may produce temporary distress in day-to-day life as a result of daily events and particular experiences, and the interindividual variations may result in negative outcomes over time associated with repeated stressor exposure. These results collectively suggest that the experience of daily stressors is associated with both physical and mental health among older adults, regardless of marital status. However, there may also be differences in the extent and type of reactivity based on stressor type and marital status of the participants that may help to increase our understanding of the mechanisms contributing to overall health status.

In addition, the finding of greater physical symptoms among married compared with widowed participants was unexpected. Research has shown that with increasing age, individuals are more likely to self-report their physical health more positively (Idler, 1993). Despite our controlling for age in the analysis of marital status and the age range of both the widowed and married participants being more than 65 years, there may be a potential confounding unmeasured variable associated with age, marital status, or physical symptoms that resulted in higher reporting of physical symptoms in the sample of married older adults. Furthermore, repeated exposure to stress may have cumulative effects over time (McEwen & Seeman, 1999), and the greater overall exposure to stressors may contribute to participants reporting more physical symptoms regardless of the type of day (stressor day vs. nonstressor day). Finally, married participants may report more physical symptoms because they are more accustomed to sharing their physical symptoms with their spouse and are therefore more likely to report symptoms as part of a study.

Study Limitations and Future Directions

Some limitations in the current study and suggestions for future research should be mentioned. First, the observational measurement of reported stressors, daily negative affect, and daily physical symptoms does not examine causal relationships that would further inform the current understanding of marital status and stressor reactivity. Future research examining reported daily affect and daily physical symptoms before and after the experience of widowhood and before and after the experience of a daily stressor is needed to better understand the temporal order and the role of stressors in daily health and well-being. Previous research has examined reactivity to stressors using measures both before and after a stressor in other populations, including middle-aged and older adults who are working versus retired (Wong & Almeida, 2012) and reactivity to daily stressors in younger versus older adults (Dijkstra, Charness, Yordon, & Fox, 2009). Similar research is needed among widowed older adults compared with older adults of other marital statuses, including married, single, and divorced older adults. Second, the significant decrease in the outcome variables over time (i.e., negative affect and physical symptoms) suggests a possible reporting bias where participants may be reporting (but not experiencing) fewer symptoms and emotions over repeated daily interviews. The current study included time as a covariate to control for possible effects of this drop-off in reports of negative affect and physical symptoms. Moreover, we attempted to control for group differences in demographic characteristics by using them as covariates in the analyses, but another method would be to match samples on these characteristics (Cook, Steiner, & Pohl, 2009), but the relatively small sample size in the current study precluded such an approach. In addition, it is also possible that because of the differences in covariates between the married and widowed participants, we were unable to account for differences in the slope, or the relationship between stressors and outcomes (negative affect and physical symptoms) that may vary as a function of the covariates. Larger sample sizes that are matched by demographics or that include the covariates as moderators in the marital status by stressor interaction effect would provide a better understanding of the role of demographics in the reactivity relationship for widowed versus married participants. Similarly, because of the relatively small sample size, we did not examine gender differences in the proposed relationships between daily stressors and reactivity to stressors. Given the evidence of possible differences in exposure and reactivity to stressors as a function of gender (Nolen-Hoeksema, 2001), future research with adequate sample sizes should examine potential gender differences. Third, the study only examined a few types of stressors believed to be associated with widowhood. Future research should continue to examine daily stressors within the context of other factors that may be associated

with health and well-being in widowhood, such as the preference for help with daily activities or the levels of and desire for social contact. Fourth, there may be some group differences, which were not included in the current analyses, such as marital satisfaction for the married participants and for the widowed participants, time since the death of their spouse. For most widowed participants in the current study, it has been 5–10 years since the death of a spouse, so findings might differ if research considered daily stressors among more recently widowed older adults. Also, in the current study, our interaction effects were relatively small, suggesting further work is needed to prospectively examine daily stressor exposure and reactivity in a larger sample with multiple marital status groups to better determine the meaning of the results.

CONCLUSIONS

In conclusion, although widowhood may not result in increased exposure to stressors, our findings provide support for both similarities and differences in stressor reactivity among married and widowed older adults. Married older adults were more emotionally reactive to interpersonal stressors, whereas widowed older adults were more physically reactive to home-related stressors. Attention to the types of daily stressors that widowed older adults experience in daily life, and the potential physical effects of daily stressors during widowhood may help to alleviate some of the physical distress widowed older adults may experience. In addition, further research is needed to better understand how intervention and supportive services targeting physical reactivity in widowhood may help to alleviate potential long-term health risks associated with physical responses to home-related stressors.

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CORRESPONDENCE

Correspondence should be addressed to Elizabeth A. Hahn, PhD, Department of Psychology, Brandeis University, 415 South Street, MS 062, Waltham, MA, 02453. E-mail: ehahn@brandeis.edu.

REFERENCES

Affleck, G., Tennen, H., Urrows, S., & Higgins, P. (1994). Person and contextual features of daily stress reactivity: Individual differences in relations of undesirable daily events with mood disturbance and chronic pain intensity. *Journal of Personality and Social Psychology*, *66*, 329–340.

Affleck, G., Zautra, A., Tennen, H., & Armeli, S. (1999). Multilevel daily process designs for consulting and clinical psychology: A preface for the perplexed. *Journal of Consulting and Clinical Psychology*, *67*, 746–754.

Almeida, D. M. (2005). Resilience and vulnerability to daily stressors assessed via diary methods. *Current Directions in Psychological Science*, *14*, 64–68. doi:10.1111/j.0963-7214.2005.00336.x

Almeida, D. M., McGonagle, K., & King, H. (2009). Assessing daily stress processes in social surveys by combining stressor exposure and salivary cortisol. *Biodemography and Social Biology*, *55*, 219–237. doi:10.1080/19485560903382338

Almeida, D. M., Wethington, E., & Kessler, R. C. (2002). The daily inventory of stressful events: An interview-based approach for measuring daily stressors. *Assessment*, *9*, 41–55. doi:10.1177/1073191102091006

Birditt, K., Cichy, K., & Almeida, D. (2011). Age differences in exposure and reactivity to interpersonal tensions among Black and White individuals across adulthood. *Race and Social Problems*, *3*, 225–239. doi:10.1007/s12552-011-9058-y

Bolger, N., Davis, A., & Rafaeli, E. (2003). Diary methods: Capturing life as it is lived. *Annual Review of Psychology*, *54*, 579–616. doi:10.1146/annurev.psych.54.101601.145030

Bolger, N., DeLongis, A., Kessler, R. C., & Schilling, E. A. (1989). Effects of daily stress on negative mood. *Journal of Personality and Social Psychology*, *57*, 808–818.

Bolger, N., & Zuckerman, A. (1995). A framework for studying personality in the stress process. *Journal of Personality and Social Psychology*, *69*, 890–902.

Bonanno, G. A., Moskowitz, J. T., Papa, A., & Folkman, S. (2005). Resilience to loss in bereaved spouses, bereaved parents, and bereaved gay men. *Journal of Personality and Social Psychology*, *88*, 827–843. doi:10.1037/0022-3514.88.5.827

Bookwala, J., & Jacobs, J. (2004). Age, marital processes, and depressed affect. *The Gerontologist*, *44*, 328–338.

Carr, D., House, J. S., Kessler, R. C., Nesse, R., Sonnega, J., & Wortman, C. B. (2000). Marital quality and psychological adjustment to widowhood among older adults. *The Journals of Gerontology, Series A: Biological Sciences and Medical Sciences*, *55*, S197.

Carr, D., & Utz, R. (2001). Late-life widowhood in the United States: New directions in research and theory. *Ageing International*, *27*, 65–88. doi:10.1007/s12126-001-1016-3

Caserta, M. S., & Lund, D. A. (2007). Toward the development of an inventory of daily widowed life (IDWL): Guided by the dual process model of coping with bereavement. *Death Studies*, *31*, 505–535. doi:10.1080/07481180701356761

Cook, T. D., Steiner, P. M., & Pohl, S. (2009). Assessing how bias reduction is influenced by covariate choice, unreliability and data analytic mode: An analysis of different kinds of within-study comparisons in different substantive domains. *Multivariate Behavioral Research*, *44*, 828–847.

Curran, P. J., & Bauer, D. J. (2011). The disaggregation of within-person and between-person effects in longitudinal models of change. *Annual Review of Psychology*, *62*, 583–619. doi:10.1146/annurev.psych.093008.100356

Dijkstra, K., Charney, N., Yordon, R., & Fox, M. (2009). Changes in physiological stress and self-reported mood in younger and older adults after exposure to a stressful task. *Neuropsychology, Development, and Cognition. Section B, Aging, Neuropsychology and Cognition*, *16*, 338–356. doi:10.1080/13825580902773859

Dohrenwend, B. P. (2006). Inventorying stressful life events as risk factors for psychopathology: Toward resolution of the problem of intracategory variability. *Psychological Bulletin*, *132*, 477–495. doi:10.1037/0033-2909.132.3.477

Finch, C. E., & Seeman, T. E. (1999). Stress theories of aging. In V. L. Bengtson & K. W. Schaie (Eds.), *Handbook of theories of aging* (pp. 81–97). New York, NY: Springer Publishing Company.

Fiske, A., Wetherell, J. L., & Gatz, M. (2009). Depression in older adults. *Annual Review of Clinical Psychology*, *5*, 363–389. doi:10.1146/annurev.clinpsy.032408.153621

Ha, J. H., & Ingersoll-Dayton, B. (2011). Moderators in the relationship between social contact and psychological distress among widowed adults. *Ageing & Mental Health*, *15*, 354–363. doi:10.1080/13607863.2010.519325

- Hahn, E. A., Cichy, K. E., Almeida, D. M., & Haley, W. E. (2011). Time use and well-being in older widows: Adaptation and resilience. *Journal of Women & Aging, 23*, 149–159. doi:10.1080/08952841.2011.561139
- Idler, E. L. (1993). Age differences in self-assessments of health: Age changes, cohort differences, or survivorship? *Journal of Gerontology, 48*, S289–S300.
- Kessler, R. C., Andrews, G., Colpe, L. J., Hiripi, E., Mroczek, D. K., Normand, S. L., ... Zaslavsky, A. M. (2002). Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychological Medicine, 32*, 959.
- Kessler, R. C., Mickelson, K. D., Walters, E. E., Zhao, S., & Hamilton, L. (2004). Age and depression in the MIDUS Survey. In O. G. Brim, C. D. Ryff, & R. C. Kessler (Eds.), *How healthy are we? A national study of well-being at midlife* (pp. 227–251). Chicago, IL: The University of Chicago Press.
- Keyes, C. L. M., & Ryff, C. D. (1998). Generativity in adult lives: Social structural contours and quality of life consequences. In D.P. McAdams & E. de St. Aubin (Eds.), *Generativity and adult development: How and why we care for the next generation* (pp. 227–263). Washington, DC: American Psychological Association.
- Kiecolt-Glaser, J. K., McGuire, L., Robles, T. F., & Glaser, R. (2002). Psychoneuroimmunology and psychosomatic medicine: Back to the future. *Psychosomatic Medicine, 64*, 15–28.
- Lachman, M. E., & Weaver, S. L. (1998). The sense of control as a moderator of social class differences in health and well-being. *Journal of Personality and Social Psychology, 74*, 763–773. doi:10.1037/0022-3514.74.3.763
- McEwen, B. S., & Seeman, T. (1999). Protective and damaging effects of mediators of stress: Elaborating and testing the concepts of allostasis and allostatic load. *Annals of the New York Academy of Sciences, 896*, 30–47. doi:10.1111/j.1749-6632.1999.tb08103.x
- McGarry, K., & Schoeni, R. F. (2005). Widow(er) poverty and out-of-pocket medical expenditures near the end of life. *The Journals of Gerontology, Series B, Psychological Sciences and Social Sciences, 60*, S160–S168.
- McIntyre, K. P. (2008). Sweating the small stuff: How different types of hassles result in the experience of stress. *Stress and Health, 24*, 383.
- Mroczek, D. K., & Almeida, D. M. (2004). The effect of daily stress, personality, and age on daily negative affect. *Journal of Personality, 72*, 355–378.
- Mroczek, D. K., & Kolarz, C. M. (1998). The effect of age on positive and negative affect: A developmental perspective on happiness. *Journal of Personality and Social Psychology, 75*, 1333–1349.
- Naef, R., Ward, R., Mahrer-Imhof, R., & Grande, G. (2012). Characteristics of the bereavement experience of older persons after spousal loss: An integrative review. *International Journal of Nursing Studies, 49*, 1016–1026. doi:10.1016/j.ijnurstu.2012.11.026
- Neupert, S. D., Almeida, D. M., & Charles, S. T. (2007). Age differences in reactivity to daily stressors: The role of personal control. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences, 62*, P216–P225.
- Nolen-Hoeksema, S. (2001). Gender differences in depression. *Current Directions in Psychological Science, 10*, 173–176. doi:10.1111/1467-8721.00142
- Nolen-Hoeksema, S., & Ahrens, C. (2002). Age differences and similarities in the correlates of depressive symptoms. *Psychology and Aging, 17*, 116–124. doi:10.1037/0882-7974.17.1.116
- O'Connor, M. F., Allen, J. J., & Kaszniak, A. W. (2002). Autonomic and emotion regulation in bereavement and depression. *Journal of Psychosomatic Research, 52*, 183–185.
- Pinquart, M., & Sörensen, S. (2003). Differences between caregivers and noncaregivers in psychological health and physical health: A meta-analysis. *Psychology and Aging, 18*, 250–267.
- Sliwinski, M. J., Almeida, D. M., Smyth, J., & Stawski, R. S. (2009). Intraindividual change and variability in daily stress processes: Findings from two measurement-burst diary studies. *Psychology and Aging, 24*, 828–840. doi:10.1037/a0017925
- Stawski, R. S., Sliwinski, M. J., Almeida, D. M., & Smyth, J. M. (2008). Reported exposure and emotional reactivity to daily stressors: The roles of adult age and global perceived stress. *Psychology and Aging, 23*, 52–61. doi:10.1037/0882-7974.23.1.52
- Stroebe, M., & Schut, H. (1999). The dual process model of coping with bereavement: Rationale and description. *Death Studies, 23*, 197–224. doi:10.1080/074811899201046
- Stroebe, M., Schut, H., & Stroebe, W. (2007). Health outcomes of bereavement. *Lancet, 370*, 1960–1973. doi:10.1016/S0140-6736(07)61816-9
- Utz, R. L., Carr, D., Nesse, R., & Wortman, C. B. (2002). The effect of widowhood on older adults' social participation: An evaluation of activity, disengagement, and continuity theories. *The Gerontologist, 42*, 522–533.
- Utz, R. L., Reidy, E. B., Carr, D., Nesse, R., & Wortman, C. (2004). The daily consequences of widowhood - The role of gender and intergenerational transfers on subsequent household performance. *Journal of Family Issues, 25*, 683–712. doi:10.1177/0192513x03257717
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*, 1063–1070.
- Wilcox, S., Evenson, K. R., Aragaki, A., Wassertheil-Smoller, S., Mouton, C. P., & Loevinger, B. L. (2003). The effects of widowhood on physical and mental health, health behaviors, and health outcomes: The Women's Health Initiative. *Health Psychology, 22*, 513–522. doi:10.1037/0278-6133.22.5.513
- Wong, J. D., & Almeida, D. M. (2012). The effects of employment status and daily stressors on time spent on daily household chores in middle-aged and older adults. *The Gerontologist, 52*, 1093–1099. doi:10.1093/geront/gns047