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The First Anniversary: Stress, Well-Being, and Optimism in Older Widows

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Abstract: The first anniversary for older widows (*n* = 47) has been explored during Months 11, 12, and 13. Concurrent correlations show that optimism inversely correlates with psychological (intrusion and avoidance) stress as measured with the Impact of Event Scale ($r = -.52$ to $-.66$, $p < .005$) and positively correlates with well-being (physical: $r = .36$ to $.46$, $p < .025$; psychosocial: $r = .58$ to $.72$, $p < .005$; spiritual: $r = .50$ to $.69$, $p < .005$). Lagged correlation patterns suggest that higher levels of optimism at a given time are associated with higher life satisfaction and spiritual well-being at later times. Psychological stress is higher at Month 12 when compared to Month 13, $t(43) = 2.54$, $p = .01$, but not when compared to Month 11, $t(43) = 1.49$, $p > .10$. There are no significant differences in physiologic stress (salivary cortisol) or well-being during the first anniversary of spousal bereavement.

Keywords: anxiety, stress, health behavior, symptom focus, community, location of care, descriptive quantitative, methods, gerontology, population focus

Spousal loss is a reality that increases with age for all married couples. By 2020 an estimated 1 million individuals will experience spousal bereavement annually (Khin & Sunderland, 2000). Of 10 million bereaved older adults, 80% are women (Fields & Casper, 2001). This stressful, yet normative, late life transition is accompanied by age-acquired stressors such as health alterations, loss of independence, involuntary relocation, and fatigue from prior spousal caregiving responsibilities (Burton, Haley, & Small, 2006; Carr, 2004). Collectively, these stressors are potential threats to wellbeing as shown by increased rates of survivor mortality and psychological and physical morbidity during the first year of bereavement (Bisconti, Bergeman, & Boker, 2004). An associated threat may be the poignant reminder of the death. Although anniversary reactions can trigger pathology in vulnerable bereaved persons (Morgan, Kingham, Nicolaou, & Southwick, 1998), previous studies of widows' well-being during the first year of spousal loss have not focused on the death anniversary (Costello & Kendrick, 2000; Kaunonen, Tarkka, Paunonen, & Laippala, 1999; Kurtz, Kurtz, Given, & Given, 1997).

Stress, Well-Being, and Optimism

The conceptual model for this study is from the theoretical work of Lazarus and Folkman (1984) and Schaefer and Moos (2001). Lazarus and Folkman emphasize the transaction between the person and the environment in explaining the dynamics of stressful experiences; Schaefer and Moos incorporate the influence of personal resources on life transition outcomes. Within the context of spousal bereavement, optimism is the personal resource (Schaefer & Moos, 2001) explored related to the hypothesized stress of the first anniversary of spousal bereavement and to well-being. Stress is defined here as bereavement-related stress that comprises both physiological stress and the subjective psychological stress component of intrusion and avoidance. Well-being refers to the widow's perception of psychosocial, physical, and spiritual health.

The stressful demands of widowhood invoke physical and psychological responses potentially threatening health (Genevro, Marshall, & Miller, 2004).\ Life event stress instruments quantify events as predictors of illness (Kanner, Coyne, Schaefer, & Lazarus, 1981) but fall short of explaining why some individuals remain healthy whereas others are more vulnerable (Lyon, 2000). A key component of individual vulnerability (Lawler, Kline, Harriman, & Kelly, 1999) is the hypothalamic–pituitary–adrenal (HPA) axis of the neuroendocrine response to stress.

The HPA mechanism integrates cortisol secretion as a biomarker of the physiologic stress response and cognitive interpretation as the psychological stress response (Crofford, Jacobsen, & Young, 1999). Increased cortisol secretion is definitive of stress states (Sapolsky, 1998) and biomarker data suggest a relation between exposure to acute and chronic stress and negative physical health outcomes (Lundberg, 2005). Increased adrenocortical activity is reported in bereaved individuals (Biondi & Picardi, 1999), including bereaved parents (Hofer, Wolff, Friedman, & Mason, 1972), bereaved spouses 1 month postloss (Jacobs et al., 1987), and in depressed bereaved individuals compared with nonbereaved controls (Roy, Gallucci, Avgerinos, Linnoila, & Gold, 1988). Prospective cortisol response data areneeded to understand further the HPA dysregulation occurring in bereavement (McCleery, Bhagwager, Smith, Goodwin, & Cowen, 2000).

Cognitive interpretations of spousal bereavement may include intrusive and avoidant thoughts (Levy & Derby, 1992). Intrusion refers to a compulsive reliving of ideas and feelings surrounding the event whereas avoidance may include denial, manifested as amnesia, inability to visualize memories, and evidence of disavowal (Aldwin & Yancura, 2004). Cognitive processes are highly influential in stress adaptation (Lazarus & Folkman, 1984) and have been studied in negative psychosocial and physical events (Aardal- Eriksson, Eriksson, Holm, & Lundlin, 1999; Thewes, Meiser, & Hickie, 2001) but not in spousal loss.

The health consequences of spousal loss may include diminished physical, psychosocial, and spiritual well-being (Fry, 2001). Physical and psychosocial well-being variables in bereavement include self-rated health and life satisfaction (Wells & Kendig, 1997). The older bereaved score lower than their married counterparts (Nieboer, Lindenberg, & Ormel, 1997). Spousal bereavement may lead to health behavior changes (Pienta & Franks, 2006) that are precursors of documented increases in illness, hospitalization, and medication use (Stroebe, Hansson, Stroebe, & Schut, 2001). Finally, spiritual well-being is associated with physical and psychological well-being and provides restoration of meaning following loss (Buford, Paloutzian, & Ellison, 1991). This dimension of well-being is important for the elderly (Fehring & Rantz, 1991), who demonstrate increased religious and spiritual beliefs at 6, 24, and 48 months postloss (Brown, Nesse, House, & Utz, 2004).

Consequences of a stressful life event on well-being may be buffered by personal resources such as optimism (Chang, 2002). Optimism, a generalized expectation for positive outcome (Scheier & Carver, 1987), is related to psychological well-being in older widows and widowers (Fry, 2001), life satisfaction in healthy older women (Rijken, Komproe, Ros, Winnubst, & van Heesch, 1995), and is a critical factor in predicting postloss depression in family caregivers (Kurtz et al., 1997). High levels of optimism are associated with absence of suicidal ideation in bereaved caregiving partners of males with AIDS (Rosengard & Folkman, 1997). Low optimism is related to higher perceived stress and decreased mental health in spousal caregivers (Hooker, Monahan, Bowman, Frazier, & Shifren, 1998).

Purpose

No descriptive studies were found that have focused on the time of the first anniversary of spousal bereavement; therefore, the primary purpose of this study was to examine changes in spousal bereavement–related stress and well-being in widows 65 years of age and older during Months 11, 12, and 13 following spousal death. A secondary purpose was to explore correlations among optimism,

spousal bereavement–related stress, and well-being during the same time frame. There were four hypotheses:

> *Hypothesis 1:* Spousal bereavement–related stress will be higher at the 12th month when compared to the 11th and 13th months following spousal death.

> *Hypothesis 2:* Well-being will be lower at the 12th month when compared to the 11th and 13th months following spousal death.

> *Hypothesis 3:* Optimism will be inversely related to spousal bereavement–related stress but positively related to well-being in Months 11, 12, and 13 following spousal death.

> *Hypothesis 4:* Spousal bereavement–related stress will be inversely related to well-being in Months 11, 12, and 13 following spousal death.

Operationalization of the variables of spousal bereavement–related stress (physiological and psychological), well-being (physical, psychosocial, and spiritual), and optimism involved five self-report instruments and salivary cortisol as a biomarker for physiological stress.

Physiological stress is the neuroendocrine response to spousal bereavement–related stress operationalized as diurnal salivary cortisol. Salivary cortisol is unaffected by flow rate and is preferable to plasma, serum, or urinary cortisol (Kirschbaum & Hellhammer, 1994). Recommended sampling times are 8 to 9 a.m., 11 to 12 a.m., 3 to 4 p.m., and 8 to 10 p.m. to observe relatively small changes in unstimulated cortisol and detect stress-related alterations of the circadian hormone profile (Kirschbaum & Hellhammer, 1989). This study limited sampling times to early morning and later evening to reduce participant burden. The saliva collection method involved Salivette™ tubes (Sarstedt, Hanover, New Jersey) composed of a plastic centrifuge tube with a plastic insert containing a cotton swab. Participants chewed the cotton swab for approximately 1 to 2 minutes and replaced in the plastic insert.

Psychological stress is defined as the subjective component of intrusion and avoidance that manifest following stressful events and serve as indicators of psychological adjustment (Horowitz, 1986). With items such as "I had waves of strong feelings about it" and "I tried to remove it from my memory," the Impact of Event Scale assesses symptoms of intrusion and avoidance with respect to a researcher-specified stressful event (Horowitz, Wilner, & Alvarez, 1979). Its 15 items are rated using a 5-point Likert-type scale from *not at all* (0) to *often* (4). The intrusion and avoidance subscales form the total Impact of Event Scale score (range 0-60) as an overall indicator of psychological stress. Higher scores reflect greater psychological stress. Cronbach's alpha in this study was .86 to .87, similar to documented reliability of .86 (Sundin & Horowitz, 2002). Total scale test–retest reliability, content validity, construct validity, and convergent validity are supported (Horowitz et al., 1979; Sundin & Horowitz, 2002).

Physical well-being is the widow's perception of her health, operationalized with a three-item measure of self-rated health developed by the researcher. Self-rated health items were similar to Ware's (1976) 32-item Health Perceptions Questionnaire, a widely used measure with reported alphas of .75 in a female sample (Thomas, 1995). In the current study, widows rated physical health, influence of physical health on activities, and physical health concerns. The brevity of the measure reduced participant burden. Possible scores range from 3 to 13, with a higher score indicative of perception of better health. Cronbach's alpha ranged from .61 to .81; validity is supported based on previous studies in which similar

subjective ratings of health corresponded well with objective assessments by health care providers (Mossey & Shapiro, 1982).

Psychosocial well-being is operationalized with the Life Satisfaction Index–A portion of the two-part Life Satisfaction Index (LSI) designed for use with the elderly (Neugarten, Havighurst, & Tobin, 1961). The two parts may be used separately or together. Part A items represent statements about life in general, for example, "I am just as happy as when I was younger" and "The things I do are as interesting to me as they ever were." The 20 items of the Life Satisfaction Index–A have response choices of yes, no, or question mark, with total scores ranging from 0 to 20. Cronbach's alpha in this sample ranged from .83 to .88; content validity (Hoyt & Creech, 1983) and construct validity (Liang, 1984) are supported.

The 20-item self-report Spiritual Well-Being Scale (SWBS) measures the quality of spiritual health (Ellison, 1983) and has two 10-item subscales, religious well-being and existential well-being. The participant responds to items such as "I believe God is concerned about my problems" and "I feel unsettled about my future" using a 6-point Likert-type format ranging from *strongly disagree* to *strongly agree*. This study used a total SWBS score that ranges from 20 to 120; higher scores indicate higher spiritual well-being. Cronbach's alpha for the total SWBS ranged from .90 to .93 in this study.

The Life Orientation Test–Revised (LOT-R) assesses the personal resource of optimism as a stable generalized expectancy for the occurrence of good outcomes in life (Scheier, Carver, & Bridges, 1994) with items such as "In uncertain times, I usually expect the best." The six items of the LOT-R have a 5-point (0 to 4) Likert-type response scale ranging from *agree a lot* to *disagree a lot* (Scheier & Carver, 1987). Items are summed for a total score ranging from 0 to 24; higher scores reflect greater optimism. Convergent, discriminant, and construct validity are supported (Scheier et al., 1994). Cronbach's alpha for this study was .82 to .87.

Method

Design and Sample

An exploratory longitudinal correlational design was used with a convenience sample recruited from within a 150-mile radius of a Midwestern city. In a 26-month recruitment period, 319 invitation letters were sent to potential participants based on local newspaper obituaries. From 73 (23%) responses, 58 widows (79%) met inclusion criteria, and of these, 47 (89%) completed the study. Participants were at least 65 years of age and not remarried, resided in a private residence or independent retirement setting, were not in the terminal stages of a disease, had telephone access, were able to read and write English, were not taking exogenous corticosteroids, and demonstrated cognitive competence. In this sample the average widow was Caucasian (100%), Protestant (68%), 74.1 years old (range 65-91, $SD = 6.3$ years), and married an average of 46.3 years (range 3-64, $SD = 15.0$ years). Spousal death represented the end of a first marriage for 36 widows (76.6%). For the others, it was the end of a second marriage and, of these, 6 had experienced a prior spousal death. Two main causes of death were cancer (38.3%) and cardiovascular disease (38.3%). Almost all the participants (89.4%) were present at the time of spousal death. The majority of the deaths were nonaccidental (97.9%), anticipated (55.3%), and occurred in a health care facility (53.2%).

Procedure

Institutional review board approval was obtained through the University of Nebraska Medical Center. For women who responded to the invitational letter and expressed an interest in participating, the investigator made a home visit at Month 11 of spousal bereavement to obtain a signed informed consent and explain the procedure for completing monthly questionnaire packets and obtaining saliva samples. Participants completed the self-administered questionnaires during scheduled saliva sampling days. The instrument packets for Months 12 and 13 were mailed to each woman 1 week prior to scheduled data collection. Phone contact ensured receipt of materials and encouraged self-report instrument completion and adherence with saliva sampling.

Salivary Sample Collection and Assay

Salivary samples were collected using Salivettes®. Women were instructed to collect two samples per day on 3 consecutive days of each month of the study time frame. The first sample was collected 45 minutes after awakening, the second 12 hours later. Participants were asked to refrain from smoking, exercising, or taking fluids immediately prior to sample collection. In a diary, participants recorded their waking time, collection times, and the most upsetting thing that had happened to them during that month's period of saliva collection in order to document nonbereavement sources of stress. Participants froze the salivary samples immediately after collection, and the samples remained frozen until the time of overnight transport on dry ice for laboratory centrifugation and assay.

Immediately prior to assay, samples were thawed, centrifuged to separate mucins (10 minutes at 2000g), and prepared for assay. An enzyme immunoassay for cortisol was used to quantify cortisol concentrations; details of the assay have been previously published (Smith & French, 1997). Briefly, microtiter plates (Nunc Maxisorp F96) were coated with cortisol antibody (R4866), and duplicate aliquots of 50 μl of undiluted saliva or cortisol standards (1000-7.8 pg in halving dilutions) were added to the wells. Labeled cortisol-HRP was added to all wells, and plates were incubated for 2 hours. Plates were then washed and ABTS [2,2′-azino-bis(3- ethylbenzthiazoline-6-sulfonic acid)] and H_2O_2 were added as a chromogen. Absorbance was measured 1 hour later on a Dynatech MR5000 microplate reader and sample concentrations were calculated using a four-parameter sigmoidal curve-fit function. Serial dilutions of a salivary pool produced a displacement curve that was parallel with the standard curve. On each microtiter plate, one high- and one low-concentration quality control pool were assayed in duplicate. Intra-assay coefficients of variation for the high and low pool were 5.9% and 5.4%, respectively, whereas interassay coefficients of variation were 9.2% and 13.7%, respectively.

Analysis

Preliminary analysis included evaluation of normality, linearity, outliers, and patterns of missing data. One woman missed a month of data collection because of temporary nursing home placement, another because of hospitalization. One woman expressed frustration and failed to complete all Questionnaires at Month 13. Otherwise, missing values on self-report items were scattered, not exceeding 5% on any item. For composite scales, if at least 80% of the items were answered, missing values were replaced with the average of that individual's valid responses on the remaining items. Approximately 9% of the saliva samples were either missing or insufficient in volume to assay accurately. To approximate normality, morning and evening salivary cortisol values required a logarithmic transformation, which is standard

procedure with biological variables (Burke, Fernald, Gertler, & Adler, 2005). Separate morning and evening cortisol averages were calculated for each month; for partial cases (fewer than 3 days), the average was calculated using that individual's available values. To estimate total diurnal cortisol activity for each month from the untransformed cortisol values, the trapezoid method of estimating the area under the curve with respect to ground (AUCg) was adapted from Pruessner, Kirschbaum, Meinlschmid, and Hellhammer (2003). With only two measurements taken on each day, the formula reduces to the sum of the daily averages of the morning and evening values (a 12-hour time frame) and will be referred to as AUC_{12}. The AUC_{12} was calculated only for cases with complete 3-day cortisol data for that month ($n = $ 41, 41, and 35, respectively).

To address the hypotheses concerning change in bereavement-related stress and well-being across the 3 months, a linear mixed model with an unstructured error variance–covariance matrix was used to test two directional planned comparisons for the Impact of Event Scale, Spiritual Well-Being Scale, Life Satisfaction Index–A, and self-rated health scores of Month 12 with the preceding and following months. Linear mixed model analysis allows testing of the same hypotheses as a traditional repeated measures ANOVA but does not require complete data or restrictive homogeneity of variance and sphericity assumptions. Because the two pairwise comparisons of interest are not orthogonal, a Bonferroni-adjusted α of .025 was used.

In analyzing the salivary cortisol measurements, time of day (morning and evening) was added as a second within-subjects factor. Salivary cortisol levels tend to show circadian patterns, with levels highest in the morning and lowest late in the evening, with some research indicating that evening values are influenced to a greater degree by external stimuli than are morning values (Kirschbaum & Hellhammer, 1989). Main effects of month and time of day (morning and evening) as well as their interaction were tested for each of the two planned comparisons. Tests were one-tailed except for the Month $\times$ Time of Day interaction, for which no hypothesis was proposed.

Adjustment of main effects for covariates is unnecessary in a completely within-subjects design because such adjustment will change only tests of between-subjects effects. It is plausible, though, that age and length of the marriage could influence the timing of change in stress and well-being, so analyses including interactions of these demographic variables with time (along with their constituent main effects) were examined. All interactions involving age and length of marriage with time were nonsignificant and differences between the two sets of results were otherwise trivial, so only results of the simpler models without these terms are reported.

Two forms of Pearson correlation coefficients were used to address the hypotheses concerning relations between stress, well-being, and optimism. Concurrent correlations were calculated, adjusting for age and length of marriage. Lagged correlations were also calculated on the basis of temporal ordering implied by the conceptual model: optimism with subsequent stress and well-being, and stress with subsequent well-being. Each lagged correlation was adjusted for age, length of marriage, and the value of the variable occurring later in the model for its value at the earlier time. For example, the relation of optimism at Month 11 with AUC_{12} at Month 12 was adjusted for age, length of marriage, and AUC_{12} at Month 11, addressing whether optimism and later AUC_{12} are related beyond what their correlation at Month 11 could account for. Partial correlations are reported rather than partial regression coefficients to facilitate

comparison with unadjusted correlations in other studies; significance tests are the same for both coefficients. One-tailed tests of significance ($\alpha = .05$) were used to match the directional hypotheses.

Results

With respect to sources of stress, 35% of the women reported death of the husband as the greatest source of stress in Month 12. Other sources reported by at least 10% of the sample in 1 or more months were household maintenance, personal health, family health, and daily life. Descriptive statistics for all instruments are displayed in Table 1.

> *Hypothesis 1:* Spousal bereavement–related stress will be higher at the 12th month when compared to the 11th and 13th months following the death of the spouse.

Planned comparisons in a linear mixed model analysis were used to determine if well-being and spousal bereavement–related stress was higher at Month 12 compared to Months 11 and 13 (Table 1). Morning cortisol levels were significantly higher than evening levels for both comparisons— Month 11 vs. 12, $t(43.5) = 14.24$, $p < .0005$; Month 12 vs. 13, $t(43.3) = 15.3$, $p < .0005$—as expected, but months did not differ in either average cortisol level or in the difference between morning and evening afternoon levels. With respect to psychological stress, however, the mean of the Impact of Event Scale at Month 12 was significantly higher than the Month 13 mean, $t(45.4) = 2.78$, $p < .01$, though not significantly higher than the mean at Month 11, $t(44.9) = 1.44$, $p = .08$.

> *Hypothesis 2:* Well-being will be lower at the 12th month when compared to the 11th and 13th months following the death of the spouse.

No significant mean differences between months were found for spiritual or physical well-being. The means for psychosocial well-being exhibited the expected pattern of being lowest at Month 12, but neither contrast was significant: Month 11 vs. 12, $t(45.8) = -1.50$, $p = .07$; Month 12 vs. 13, $t(44.9) = 1.45$, $p = .08$.

Correlational results are presented in Table 2. Significant findings are summarized below, with $p < .05$ unless otherwise stated.

> *Hypothesis 3:* Optimism will be inversely related to spousal bereavement–related stress but positively related to well-being.

Concurrent correlations. The hypothesis was supported in all 3 months, with widows with higher optimism scores having lower intrusion and avoidance scores. An inverse relation with physiological stress was less consistently supported, although high levels of optimism were often associated with low physiological stress. Significant relations were found for optimism with morning cortisol in Months 11 and 12 and with both evening cortisol and AUC12 in Months 12 and 13. In Month 11, the relation with AUC12 was borderline ($r = -.24$, $p = .07$). Optimism also was significantly correlated with spiritual, psychosocial, and physical well-being at all three times, supporting the hypothesized relation. Widows with higher optimism scores consistently had higher well-being scores measured in the same month.

Lagged correlations. Optimism in Month 11 was not correlated significantly with psychological stress in later months. Month 11 optimism showed a stronger pattern of association with later physiological stress

measures: Correlations were significant with Month 12 evening cortisol and AUC12 and borderline ($r = -.23$, $p = .07$) with Month 12 morning cortisol. Month 12 optimism was significantly related to both psychological stress and AUC12 in Month 13.

Month 11 optimism was positively related to psychosocial well-being at Month 12 and spiritual and psychosocial well-being at Month 13. A similar pattern was seen in the relation of Month 12 optimism with Month 13 spiritual and psychosocial well-being. The only significant relation involving physical well-being was Month 11 optimism and Month 12 self-reported health.

Hypothesis 4: Spousal bereavement–related stress will be inversely related to well-being.

Concurrent correlations. The hypothesized relation was found at all 3 months for psychological stress with spiritual and psychosocial well-being but only at Months 11 and 12 for physical well-being. These results partially support the hypothesis that older widows with higher psychological stress have lower well-being during the first anniversary. In contrast, the hypothesized relation between widows' physical stress and well-being was less consistently supported. In Month 13, AUC_{12} was inversely related to spiritual and psychosocial well-being, as was evening cortisol. In addition, evening cortisol was related to spiritual well-being in Month 11 and AUC_{12} was related to psychosocial well-being in Month 12. Morning cortisol showed no significant relation with well-being at any of the three time points.

Lagged correlations. Psychological stress in Month 11 was inversely related to psychosocial well-being in Month 12 and to both spiritual and psychosocial well-being in Month 13. Month 12 psychological stress was inversely related to both spiritual and psychosocial well-being in Month 13 but not with physical well-being ($r = -.21$, $p = .09$). Physiological stress exhibited a much weaker association with well-being. Higher morning cortisol and AUC_{12} in Month 11 were associated with lower psychosocial well-being in Month 12. Month 11 morning cortisol also was correlated with Month 13 self-reported physical health but not in the hypothesized direction. None of the measures of physiological stress at Month 12 were significantly related to any of the measures of well-being at Month 13.

Discussion

This study addressed two previously undocumented areas of late life spousal bereavement. The first anniversary was chosen as the focal point because bereavement research typically avoids Month 12, a time acknowledged as particularly painful (Anderson & Dimond, 1995). The inclusion of this time frame adds knowledge about older widows' stress and well-being during a portion of bereavement known for "fresh bursts of grief" (Raphael, 1983). Second, the inclusion of both psychological and physiological indicators fills a gap in knowledge about stress measurement in older widows and about the stress–health relation during bereavement.

Mean psychological stress (intrusive and avoidant thoughts) during the first anniversary was significantly higher in Month 12 than in Month 13 but not different from Month 11. This suggests that increases in bereavement-related psychological stress may actually begin prior to the anniversary month, but extended data collection both preceding and following the anniversary is needed for a more definitive analysis of this possibility. In contrast, there were no significant differences in overall level of salivary cortisol in Month 12 compared with Months 11 and 13, consistent with a normal circadian pattern for this hormone.

The average drop in cortisol from morning to evening was smaller in Month 13 than in Month 12 (the interaction of month with time of day) but not significantly so.

It appears that physiological and psychological stress do not develop at the same rate or manifest to the same degree during this time period. Previous studies finding that stressful stimuli produce the cortisol response were laboratory studies in which an immediate and short-term response was intentionally provoked (Nes, Segerstrom, & Sephton, 2005). This study's findings suggest that the cortisol response to the natural stress of the anniversary of spousal loss may be less immediate. Differing results for psychological and physiological stress undoubtedly also reflect differences in the measures used in this study. The Impact of Event Scale was designed to measure psychological stress specific to one event, whereas salivary cortisol reflects physiological responses to daily stresses as well as to bereavement. Diary information collected during saliva collection days indicated that these widows experienced many stresses of daily life.

In future studies, adding a formal measure of general perceived stress may allow for more sensitive analysis of bereavement-related stress through statistical adjustment for other sources of stress. Additional stressors to consider would be spousal caregiving responsibilities prior to death and also concurrent bereavement losses as several participants identified losing an adult child, a sibling, or a close friend within the first year of spousal loss. In addition, more frequent sampling of saliva would allow more sophisticated modeling of the physiological stress response. The study participants were consistently compliant with the saliva collection procedure to collect two daily samples, so extending the sampling might be feasible.

There were no significant differences on any of the well-being measures between the anniversary month and Months 11 and 13. Descriptively, the means of life satisfaction (psychosocial well-being) showed the expected pattern of decrease at Month 12, but for spiritual well-being, a decrease from Month 11 to Month 12 was followed by virtually no change in Month 13. Effects of the anniversary on various types of well-being may differ not only in time of occurrence but in duration, and further investigation is needed. Physical well-being showed no evidence of change during this period. The measure of self-reported health used in the current study was designed to minimize participant burden but may have been too global and insensitive to subtle changes that could occur in a short period of time. A more comprehensive assessment of the physical aspect of well-being should be included in future studies. In addition, detecting changes in health brought about by stress may require measurement beyond the time frame of this study.

When measured concurrently, optimism was inversely related to psychological stress in all 3 months studied. Similar associations have been reported in nonbereaved samples using other measures (Cassidy, 2005), and the findings support the stability of optimism over time. Lagged relations were significant only for Month 12 optimism with Month 13 psychological stress, suggesting that if higher levels of optimism influence later psychological stress levels, this may occur in dealing with stress after and not in preparation for the anniversary month. Findings for the relation of optimism to physiological stress were less consistent. Measured within the same month, optimism was related to morning cortisol in Months 11 and 12 and to both evening cortisol and AUC12 in Months 12 and 13. On the other hand, more of the lagged correlations were significant than were found for psychological stress and may reflect slower change in the physiological response.

Optimism and all three forms of well-being were consistently positively associated when measured in the same month. These data are consistent with findings that optimism is related to psychological and spiritual wellbeing in older bereaved (Fry, 2001) and to health outcomes in nonbereaved samples (Chang, 2002; Kubzansky et al., 2002). In general, the pattern of lagged correlations showed that widows with higher levels of optimism at a given time also tend to have higher life satisfaction and spiritual well-being at later times, even after controlling for earlier level of well-being. The single exception was optimism in Month 11 having virtually no relation with spiritual well-being in the anniversary month. For physical well-being, only one lagged correlation was significant, Month 11 optimism with selfreported health at Month 12.

Widows with high psychological stress tended to have low scores on measures of well-being obtained in the same month, consistent with the theorized profound impact of psychological stress on individual well-being (Burton et al., 2006). The sole exception was the relation between psychological stress and physical well-being in Month 13. In contrast, few of the correlations of measures of physiological stress and well-being were significant, whether concurrent or lagged. As was discussed for the mean comparisons, studying changes in physiological stress may require follow-up beyond Month 13.

With little prior work having examined the months surrounding the bereavement anniversary, it was important to describe and test changes in stress and well-being during this time frame. The conceptual basis for this study, though, does suggest a model with stress mediating the relation between optimism and well-being. A secondary purpose was to begin examining relations among the variables in the model, which we carried out with correlational analysis. With a limited sample and no theory specifying the exact timing of effects, formal testing of a mediation model would be premature. Fritz and MacKinnon (2007) showed that at least 71 participants are needed to have adequate power to test mediation in cross-sectional data even if both paths involved in the mediation effect have medium effect sizes. Appropriate modeling of longitudinal mediation is more complex, requiring even larger samples. Differences in the concurrent and lagged correlations do illustrate the importance of not assuming that correlations estimated using cross-sectional data sets accurately represent longitudinal relations among variables (Maxwell & Cole, 2007). Data need to be collected from a longer period around the anniversary of spousal loss to allow development and formal testing of longitudinal mediation models with varying timing of effects. Alternative conceptual models also should be investigated, including optimism as a possible moderator of the relation between stress and subsequent well-being (Hirsch, Wolford, LaLonde, Brunk, & Morris, 2007).

Several limitations to this study are noted. Despite 26 months of recruitment, the final sample of 47 (42 for some of the cortisol analyses) was smaller than the 62 that had been projected in order for the tests of the planned mean comparisons to have adequate power to test a medium effect size. Because of the exploratory nature of the correlational part of this study, alpha was not adjusted to control for Type I error inflation. With the large number of correlations examined, some certainly would have been expected to be significant simply because of sampling error. Correlations in a small sample have wide confidence intervals and data from a larger sample are needed to more precisely estimate the relations reported.

Although participants varied in age and length of marriage, the sample may have been unrepresentative in other respects. The geographical area from which the sample was recruited is neither densely populated nor ethnically diverse. There was no sample attrition in this study, but it is possible that widows choosing

to participate were less stressed or more comfortable with revealing personal information than were those who refused. The study was also restricted to women; future research with widowers is needed.

Optimism was only sometimes related to subsequent stress and wellbeing, but the consistent inverse concurrent relations with psychological stress and all aspects of well-being warrant nursing observation and assessment of this personal resource. Nursing recognition of the first anniversary as a potentially stressful time can be reassuring for bereaved clients and provides an impetus for assessment of optimism early in the bereavement process. The ongoing assessment of stress appraisal in older widows and the integration of stress management interventions into the continuum of bereavement care is also indicated.

One directive for bereavement research emphasizes the longitudinal exploration of resources, risk factors, and patterns of change during late-life spousal bereavement (Carr, Wortman, & Nesse, 2006). This study provides an initial look at stress, well-being, and optimism during a critical remembrance time. Additional study of these variables throughout bereavement is needed to understand further the outcomes for older widows.

Table 1. Descriptive Statistics and Linear Mixed Model Planned Comparisons

Variable	Month	n	Range	M (SD)	Comparison	t	p
					Linear Mixed Model		
IES	11	46	0 to 56	26.6 (13.4)			
	12	46	2.33[a] to 60	29.0 (13.8)			
	13	46	0 to 52	25.2 (12.9)			
					M12 vs. M11	1.44	.08
					M12 vs. M13	2.78	<.01
LSI-A	11	47	3 to 20	12.3 (4.4)			
	12	47	2 to 19	11.6 (4.5)			
	13	47	0 to 19	12.4 (5.0)			
					M12 vs. M11	-1.50	.07
					M12 vs. M13	-1.45	.08
SRH	11	47	6 to 12	9.5 (1.5)			
	12	46	5 to 13	9.5 (1.8)			
	13	46	5 to 13	9.7 (1.9)			
					M12 vs. M11	-0.02	.49
					M12 vs. M13	0.77	.22
SWBS	11	47	57 to 120	102.9 (13.6)			
	12	46	63 to 120	101.0 (13.5)			
	13	45	64 to 120	100.7 (16.0)			
					M12 vs. M11	-1.31	.10
					M12 vs. M13	0.31	.38
Morning cortisol[b]	11	45	0.58 to 1.42	1.05 (0.19)			
	12	44	0.50 to 2.06	1.09 (0.27)			
	13	42	0.49 to 1.48	1.08 (0.21)			
Evening cortisol[b]	11	45	0.01 to 1.27	0.47 (0.27)			
	12	44	-0.17 to 1.91	0.48 (0.36)			
	13	42	-0.16 to 1.46	0.53 (0.31)			
					M12 vs. M11		
					Morning or evening	14.24	<.0005
					Month	0.57	.28
					Month × Morning or Evening	0.72	.48[c]
					M12 vs. M13		
					Morning or evening	15.3	<.0005
					Month	-0.28	.39
					Month × Morning or Evening	1.38	.18[c]
LOT-R	11	47	6 to 24	18.1 (4.6)			
	12	47	4 to 24	17.7 (5.0)			
	13	47	5 to 24	18.6 (4.9)			

Note: IES = Impact of Event Scale; LSI-A = Life Satisfaction Index, Part A; SRH = self-reported health; SWBS = Spiritual Well-Being Scale; LOT-R = Life Orientation Test-Revised; M11, M12, and M13 = Month 11, Month 12, and Month 13, respectively.
a. Noninteger value as a result of substituting mean of individual's valid responses for a missing value.
b. Logarithmic transformation to base 10 of raw cortisol values.
c. Tests of interaction were nondirectional.

Table 2. Concurrent and Lagged Partial Correlations[a] of Optimism With Stress, Optimism With Well–Being, and Stress With Well–Being, Adjusted for Age and Length of Marriage

		IES			Morning Cortisol			Evening Cortisol			Cortisol AUC$_{12}$		
		Month 11	Month 12	Month 13	Month 11	Month 12	Month 13	Month 11	Month 12	Month 13	Month 11	Month 12	Month 13
LOT-R	Month 11	-.65**			-.29*			-.11			-.24		
	Month 12	.01	-.57**		-.23	-.32*		-.30*	-.28		-.47**	-.55**	
	Month 13	.11	-.27*	-.67**	.05	.03	-.14	-.13	-.10	-.35*	-.26	-.38*	-.63**
LOT-R	Month 11	.50** _(SWBS)_			.64** _(LSIA)_			.44** _(SRH)_					
	Month 12	.08	.64**		.29*	.69**			.49**				
	Month 13	.28	.31*	.70**	.42**	.46**	.77**	.20	-.05	.38**			
IES	Month 11	-.42**			-.45**			-.42**					
	Month 12	-.11	-.40**		-.33*	-.46**		-.15	-.37**				
	Month 13	-.44**	-.38**	-.51**	-.56**	-.55**	-.57**	.05	-.21	-.16			
Morning cortisol	Month 11	.18			-.13								
	Month 12	-.11	.08										
	Month 13	-.08	-.06	-.02			-.05						
Evening cortisol	Month 11	-.25			-.23			.15					
	Month 12	.20	-.11			-.22			.04				
	Month 13	.02	-.12	-.40**	-.23		-.36**	.03					
Cortisol AUC$_{12}$	Month 11	.01			-.40**			.23					
	Month 12	.03	-.23			-.31*			.02				
	Month 13	.07	-.03	-.37*	-.12	-.15	-.63**	.18		.10			

Note: N = 39 – 47. LOT–R = Life Orientation Test–Revised; IES = Impact of Event Scale; SWBS = Spiritual Well–Being Scale; LSI–A = Life Satisfaction Index–A; SRH = self–rated health; Cortisol AUC$_{12}$ = area under the curve; morning and evening cortisol values are log transformed.

a. Concurrent correlations (in italic) were adjusted for age and length of marriage. Lagged correlations (off–diagonal values) were also adjusted for the later measure at the earlier time (e.g., Month 11 LOT was correlated with Month 13 IES, controlling for IES at Month 11).

*p < .05. **p < .01. (for one–tailed tests of significance)

References

Aardal-Eriksson, E., Eriksson, T., Holm, A., & Lundlin, T. (1999). Salivary cortisol and serum prolactin in relation to rating scales in a group of rescue workers. *Biological Psychiatry, 46*, 850-855.

Aldwin, C. M., & Yancura, L. (2004). Coping and health: A comparison of the stress and trauma literatures. In P. P. Schnurr & B. L. Green (Eds.), *Physical health consequences of exposure to extreme stress* (pp. 99-125). Washington, DC: American Psychological Association.

Anderson, K. L., & Dimond, M. F. (1995). The experience of bereavement in older adults. *Journal of Advanced Nursing, 22*, 308-315.

Biondi, M., & Picardi, A. (1999). Psychological stress and neuroendocrine function in humans: The last two decades of research. *Psychotherapy and Psychosomatics, 68*, 114-150.

Bisconti, T., Bergeman, C., & Boker, S. (2004). Emotional well-being in recently bereaved widows: A dynamical systems approach. *Journals of Gerontology: Psychological and Social Sciences, 59B*(4), P158-P167.

Brown, S. L., Nesse, R. M., House, J. S., & Utz, B. (2004). Religion and emotional compensation: Results from a prospective study of widowhood. *Personality and Social Psychology Bulletin, 30*(9), 1165-1174.

Buford, M. L., Paloutzian, R. F., & Ellison, C. W. (1991). Norms for the Spiritual Well-Being Scale. *Journal of Psychology and Theology, 19*(1), 56-70.

Burke, H. M., Fernald, L. C., Gertler, P. J., & Adler, N. E. (2005). Depressive symptoms are associated with blunted cortisol stress responses in very low-income women. *Psychosomatic Medicine, 67*, 211-216

Burton, A. M., Haley, W. E., & Small, B. J. (2006). Bereavement after caregiving or unexpected death: Effects on elderly spouses. *Aging & Mental Health, 10*(3), 319-326.

Carr, D. (2004). Gender, pre-loss marital dependence and older adults' adjustment to widowhood. *Journal of Marriage and Family, 66*, 220-235.

Carr, D., Wortman, C., & Nesse, R. (2006). Understanding late-life widowhood: New directions in research, theory, and practice. In D. Carr, R. Nesse, & C. Wortman (Eds.), *Spousal bereavement in late life* (pp. 3-18). New York: Springer..

Cassidy, T. (2005). Leisure, coping, and health: The role of social, family, school and peer relationship factors. *British Journal of Guidance and Counselling, 33*(1), 51-66.

Chang, E. C. (2002). Optimism-pessimism and stress appraisal: Testing a cognitive interactive model of psychological adjustment in adults. *Cognitive Therapy and Research, 26*(5), 675-690.

Costello, J., & Kendrick, K. (2000). Grief and older people: The making or breaking of emotional bonds following partner loss in later life. *Journal of Advanced Nursing, 32*(6), 1374-1382.

Crofford, L. J., Jacobson, J., & Young, E. (1999). Modeling the involvement of the hypothalamic-pituitary-adrenal and hypothalamic-pituitary-gonadal axes in autoimmune and stress-related rheumatic syndromes in women. *Journal of Women's Health, 8*(2), 203-215.

Ellison, C. W. (1983). Spiritual well-being: Conceptualization and measurement. *Journal of Psychology and Theology, 11*(4), 330.

Fehring, R. J., & Rantz, M. (1991). Spiritual distress in institutionalized elderly. In M. Mass & K. Buckwalter (Eds.), *Nursing diagnosis and interventions for the elderly* (pp. 598-609). Menlo Park, CA: Addison-Wesley.

Fields, J., & Casper, L. M. (2001). *America's families and living arrangements: March 2000*. (Current Population Reports, P20-537). Retrieved April 10, 2009, from http://www.census.gov/prod/2001pubs/p20-537.pdf

Fritz, M. S., & Mackinnon, D. P. (2007). Required sample size to detect the mediated effect. *Psychological Science, 18*, 233-239.

Fry, P. S. (2001). The unique contribution of key existential factors to the prediction of psychological well-being of older adults following spousal loss. *The Gerontologist, 41*, 69-81.

Genevro, J. L., Marshall, T., & Miller, T. (2004). Report on bereavement and grief research. *Death Studies, 28*(6), 491-575.

Hirsch, J., Wolford, K., Lalonde, S., Brunk, L., & Morris, A. P. (2007). Dispositional optimism as a moderator of the relationship between negative life events and suicide ideation and attempts. *Cognitive Therapy Research, 31*, 533-546.

Hofer, M. A., Wolff, C. T., Friedman, S. B., & Mason, J. W. (1972). A psychoendocrine study of bereavement: I. 17 hydroxycorticosteroid rates of parents following the death of their children from leukemia. *Psychosomatic Medicine, 34*, 481-491.

Hooker, K., Monahan, D., Bowman, S., Frazier, L., & Shifren, K. (1998). Personality counts for a lot: Predictors of mental and physical health of spouse caregivers on two disease groups. *Journal of Gerontology: Psychological Sciences, 53B*(2), P73-P85.

Horowitz, M. (1986). Stress-response syndromes: A review of posttraumatic and adjustment disorders. *Hospital and Community Psychiatry, 37*(3), 241-249.

Horowitz, M., Wilner, N., & Alvarez, W. (1979). Impact of Event Scale: A measure of subjective stress. *Psychosomatic Medicine, 41*, 209-218.

Hoyt, D. R., & Creech, J. C. (1983). The Life Satisfaction Index: A methodological and theoretical critique. *Journal of Gerontology, 38*, 111-116.

Jacobs, S., Mason, J., Kosten, T. R., Kasl, S. V., Ostfeld, A. M., & Wahby, V. (1987). Urinary free cortisol and separation anxiety early in the course of bereavement and threatened loss. *Biologic Psychiatry, 22*, 148-152.

Kanner, A. D., Coyne, J., Schaefer, C., & Lazarus, R. (1981). Comparison of two modes of stress measurements: Daily hassles and uplifts versus major life events. *Journal of Behavioral Medicine, 4*, 1-39.

Kaunonen, M., Tarkka, M. T., Paunonen, M., & Laippala, P. (1999). Grief and social support after the death of a spouse. *Journal of Advanced Nursing, 30*(6), 1304-1311.

Khin, N. A., & Sunderland, T. (2000). Bereavement in older adults: Biological, functional and psychological consequences. *Psychiatric Times, 17*(1). Retrieved April 10, 2009, from http://www.psychiatrictimes.com/display/article/10168/1166991

Kirschbaum, C., & Hellhammer, D. H. (1989). Salivary cortisol in psychobiological research: An overview. *Neuropsychobiology, 22*, 150-169.

Kirschbaum, C., & Hellhammer, D. H. (1994). Salivary cortisol in psychoneuroendocrine research: Recent developments and applications. *Psychoneuroendocrinology, 19*, 313-333.

Kubzansky, L., Wright, R., Cohen, S., Weiss, M., Rosner, B., & Sparrow, D. (2002). Breathing easy: A prospective study of optimism and pulmonary function in the normative aging study. *Annals of Behavioral Medicine, 24*(4), 345-353.

Kurtz, M. E., Kurtz, J. C., Given, C. W., & Given, B. (1997). Predictors of post bereavement depressive symptomatology among family caregivers of cancer patients. *Supportive Cancer Care, 5*, 53-60.

Lawler, K. A., Kline, K. A., Harriman, H., & Kelly, K. (1999). Stress and illness. In V. J. Derlega, B. Winstead, & W. Jones (Eds.), *Personality: Contemporary theory and research* (pp. 489-513). Chicago: Nelson-Hall.

Lazarus, R., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer.

Levy, L. H., & Derby, J. F. (1992). Bereavement support groups: Who joins, who does not and why. *American Journal of Community Psychology, 20*(5), 649-662.

Liang, J. L. (1984). Dimensions of the Life Satisfaction Index-A: A structural formulation. *Journal of Gerontology, 39*(5), 613-622.

Lundberg, U. (2005). Stress hormones in health and illness: The roles of work and gender. *Psychoneuroendocrinology, 30*(10), 1017-1021.

Lyon, B. L. (2000). Stress, coping, and health: A conceptual overview. In V. H. Rice (Ed.), *Handbook of stress, coping, and health: Implications for nursing research, theory, and practice* (pp. 3-23). Cambridge, UK: Cambridge University Press.

Maxwell, S. E., & Cole, D. A. (2007). Bias in cross-sectional analyses of longitudinal mediation. *Psychological Methods, 12*, 23-44.

McCleery, J. N., Bhagwager, Z., Smith, K. A., Goodwin, G. M., & Cowen, P. J. (2000). Modeling a loss event: Effect of imagined bereavement on the hypothalamic-pituitary-adrenal axis. *Psychological Medicine, 30*, 219-223.

Morgan, C. A., Kingham, P., Nicolaou, A., & Southwick, S. M. (1998). Anniversary reactions in Gulf War veterans: A naturalistic inquiry 2 years after the Gulf War. *Journal of Traumatic Stress, 11*(1), 165-171.

Mossey, J., & Shapiro, E. (1982). Self-rated health: A predictor of mortality among the elderly. *American Journal of Public Health, 22*, 800-808.

Nes, L., Segerstrom, S., & Sephton, S. (2005). Engagement and arousal: Optimism's effects during a brief stressor. *Personality and Social Psychology Bulletin, 31*(1), 111-120.

Nieboer, A. P., Lindenberg, S. M., & Ormel, J. (1997). Conjugal bereavement and well-being of elderly men and women: A preliminary study. *Omega, 32*(2), 113- 141.

Neugarten, B., Havighurst, R. J., & Tobin, S. S. (1961). The measurement of life satisfaction. *Journal of Gerontology, 16*(2), 134-143.

Pienta, A., & Franks, M. (2006). A closer look at health and widowhood: Do health behaviors change after the loss of a spouse? In D. Carr, R. Nesse, & C. Wortman (Eds.), *Spousal bereavement in late life* (pp. 117-142). New York: Springer.

Pruessner, J. C., Kirschbaum, C., Meinlschmid, G., & Hellhammer, D. H. (2003). Two formulas for computation of the area under the curve represent measures of total hormone concentration versus time-dependent change. *Psychoneuroendocrinology, 28*, 916-931.

Raphael, B. (1983). *The anatomy of bereavem*ent. Northvale, NJ: Basic Books.

Rijken, M., Komproe, I., Ros, W., Winnubst, J., & van Heesch, N. (1995). The subjective well-being of elderly women: Conceptual differences between cancer patients, women suffering from chronic ailments and healthy women. *British Journal of Clinical Psychology, 34*, 289-300.

Rosengard, C., & Folkman, S. (1997). Suicide ideation, HIV serostatus and psychosocial variables in partners of men with AIDS. *AIDS Care, 9*(4), 373-384.

Roy, A., Gallucci, W., Avgerinos, P., Linnoila, M., & Gold, P. (1988). The CRH stimulation test in bereaved subjects with and without accompanying depression. *Psychiatry Research, 25*(2), 145-156.

Sapolsky, R. M. (1998). *Why zebras don't get ulcers: An updated guide to stress, stress-related diseases, and coping*. New York: Freeman.

Schaefer, J. A., & Moos, R. H. (2001). Bereavement experiences and personal growth. In M. S. Stroebe, R. Hansson, & W. Stroebe (Eds.), *Handbook of bereavement research: Consequences, coping, and care* (pp. 145-167). Washington, DC: American Psychological Association.

Scheier, M. F., & Carver, C. (1987). Dispositional optimism and physical wellbeing: The influence of generalized outcome expectancies on health. *Journal of Personality, 55*, 169-210.

Scheier, M. F., Carver, C., & Bridges, M. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self esteem): A re-evaluation of Life Orientation Test. *Journal of Personality and Social Psychology, 67*, 1063-1078.

Smith, T., & French, J. (1997). Psychosocial stress and urinary cortisol excretion in marmoset monkeys. *Physiology and Behavior, 62*(2), 225-232.

Stroebe, M. S., Hansson, R. O., Stroebe, W., & Schut, H. (2001). Introduction: Concepts, and issues in contemporary research on bereavement. In M. S.

Stroebe, R. O. Hansson, W. Stroebe, & H. Schut (Eds.), *Handbook of bereavement research: Consequences, coping, and care* (pp. 3-22). Washington, DC: American Psychological Press.

Sundin, E. C., & Horowitz, M. J. (2002). Impact of Event Scale: Psychometric properties. *British Journal of Psychiatry, 180*, 205-209.

Thewes, B., Meiser, B., & Hickie, J. B. (2001). Psychometric properties of the impact of event scale amongst women at increased risk for hereditary breast cancer. *Psycho-Oncology, 10*, 459-468.

Thomas, S. P. (1995). Psychosocial correlates of women's health in middle adulthood. *Issues in Mental Health Nursing, 16*, 285-314.

Ware, J. E. (1976). Scales for measuring general health perceptions. *Health Services Research, 11*, 396-415.

Wells, Y. D., & Kendig, H. L. (1997). Health and well-being of spouse caregivers and the widowed. *The Gerontologist, 37*(5), 666-674.