Moderating Effects of Prior Social Resources on the Hospitalizations of Elders Who Become Widowed

SHEILA FELD, PhD
University of Michigan
LINDA K. GEORGE, PhD
Duke University Medical Center

In a prospective design, the effects of social resources before widowhood on changes in subsequent hospitalizations were compared for 86 married elders who became widowed over a 2-year period and 86 matched elders who remained married. Subjects were from the Established Populations for Epidemiologic Studies of the Elderly (Duke). Hospitalizations were used as an indicator of a serious health outcome whose report was unlikely to be biased by a widowed person's emotional state. The hypothesis that perceptions of inadequate social support from persons other than the spouse would exacerbate the effects of bereavement on hospitalizations was supported for elders who lacked close friends with whom to talk about private matters while still married; believing that no relative would provide such support and dissatisfaction with support tended to have the same effect. Inadequacies in social embeddedness (few contacts with friends, relatives, or children and being childless) had no significant moderating or main effects on change in hospitalizations.

Despite considerable research on the consequences of conjugal bereavement for the elderly, there is controversy about the extent to which widowhood hastens death or impairs physical health. Recent reviews suggest that such effects are well-established (Stroebe,

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Hansson, & Stroebe, 1993), equivocal (Seeman, Kaplan, Knudsen, Cohen, & Guralnik, 1987), and minimal (Norris & Murrell, 1990). Although not all widowed elders experience health declines, some do suffer adverse outcomes. As Ferraro (1989) and Wortman and Silver (1990) have noted, a critical issue is to define the conditions under which conjugal bereavement increases health risks among the aged.

Prior research and theory highlight the potentially moderating effects of social resources on the ability to cope with the consequences of negative life events and chronic strains (e.g., George, 1980; Murrell & Norris, 1983). The present study applies this moderator model of stress-buffering to conjugal bereavement. We test the hypothesis that widowed elders who have deficits in social resources will be at greater risk for hospitalizations than widowed persons with adequate social resources.

Some evidence suggests that widowed elders with inadequate social resources suffer poor health outcomes (e.g., Osterweis, Solomon, & Green, 1984; Silverstein & Bengtson, 1991). The interpretation of these results as supporting the moderator buffering hypothesis is, however, often limited by the research design and the way social resources are conceptualized.

Unrepresentative samples, cross-sectional analyses, and the absence of nonbereaved comparison groups make it impossible to determine the causal direction of relationships between social resources and health and to discover whether social resources have distinctive benefits for widowed persons, as has been noted (e.g., Avis, Brambilla, & Vass, 1991; Ferraro, 1989). Longitudinal research that lacks data on social resources before widowhood makes it impossible to determine if social resources are beneficial because previously available resources moderate the deleterious effects of bereavement stress on health or because bereavement mobilizes new social resources that then suppress the negative effects of bereavement stress on health (Krause, 1989).

A prospective design that compares the effects of *preexisting* social resources on the *subsequent* health of a representative sample of bereaved and nonbereaved elders is required to test whether the impact of bereavement on health is moderated by social resources (Avis et al., 1991; Osterweis et al., 1984; Stroebe et al., 1993). The present study uses this design to study the effects of prior social resources on the

relationship between conjugal bereavement and hospitalizations, a significant health outcome for the elderly.

We also examine two types of social resources that have been suggested to have different stress-buffering potential, social embeddedness and perceived social support (Krause, 1989). Social embeddedness refers to "the connections that individuals have to significant others in their environment" (Barrera, 1986, p. 415). Perceived social support is the subjective evaluation of the supportive quality of those ties.

CONJUGAL BEREAVEMENT AND HEALTH

The effects of conjugal bereavement on biological functioning and on health behaviors are the main proposed links between becoming widowed and deteriorating health. Although it is not clear whether physiological reactions to conjugal bereavement are distinctive or necessarily compromise long-term health (Osterweis et al., 1984), several studies of conjugal bereavement have shown reductions in the body's immunological defenses (Irwin & Pike, 1993; Laudenslage & Reite, 1984; Schleifer, Keller, Camerino, Thornton, & Stein, 1983). Such effects could contribute to an increased risk for hospitalizations among widowed elders.

Conjugal bereavement may also affect health behaviors. Grief and depression may result in efforts to deny the loss such as alcohol use and neglect of good nutrition (Perkins & Harris, 1990). Motivation for maintaining good health may suffer if the loss of the spousal role reduces the purpose and meaning in life (Umberson, 1987). The loss of the spouse's health-related social controls may diminish healthy food consumption (Rosenbloom & Whittington, 1993), compliance with medical regimes, or restraints on risky health practices (Umberson, 1987). Such changes in health-promoting or health-threatening behaviors could exacerbate chronic health problems of the elderly. This could result in an increased likelihood of hospitalizations.

SOCIAL RESOURCES AND THE HEALTH OUTCOMES OF CONJUGAL BEREAVEMENT

Theory and research suggest that social resources can reduce some biological and behavioral disruptions triggered by the death of one's

spouse (Osterweis et al., 1984). Perceiving that emotional support is available may mitigate depressive symptoms, and depression has been identified as a mediator between bereavement and interferences with the immune system (Irwin & Pike, 1993). Believing that informational and instrumental support is available may enhance the survivor's coping options (Wethington & Kessler, 1986), thereby reducing distress and its physiological outcomes.

Social resources may also mitigate problematic health behaviors associated with widowhood. The perception that support is available if needed may lessen some of the survivor's distress that triggers health threatening activities. Close ties and responsibilities that go beyond the marital dyad may provide alternative motivations for beneficial health practices (House, Robbins, & Metzner, 1982). Supportive children may partially substitute for the health care provided by the spouse (Cantor & Little, 1985). Informational and emotional support from friends and relatives may encourage healthy behaviors and sanction risky ones (Rook, Thuras, & Lewis, 1990). These types of primary group supports have been proposed to reduce the types of hospitalizations and mortality that are affected by practicing healthy behaviors and avoiding risky ones, such as trauma and deaths due to drinking while driving or to cardiovascular crises that are precipitated by poor dietary habits (Litwak & Messeri, 1989). Such supporters may also provide appropriate referrals to physicians or home health care services, which can provide assistance that lessens the threats from serious illness.

PERCEIVED SOCIAL SUPPORT AND SOCIAL EMBEDDEDNESS

Both social embeddedness and perceived social support have been proposed to moderate the effects of conjugal bereavement on health. More often, however, the main effects of deficits in social embeddedness and the moderating effects of perceived social support have been investigated and supported (Cohen & Wills, 1985; House, Umberson, & Landis, 1988).

Prospective studies provide strong evidence that "social relationships are very consequential for health" (House et al., 1988, p. 299), with social isolation having especially deleterious consequences. This

suggests that any elder who is not embedded in social relationships might be at risk for poor health and hospitalizations. Such deficits may also be especially harmful to the health of widowed elders in certain circumstances. Deficits in role relationships are likely when social connections are limited and this can exacerbate the diminished sense of purpose in life that often follows the loss of the marital role. Because social support is not equally likely from all social ties, however, limited ties need not signify a deficit in social support, and in that circumstance, may not have distinctive consequences for widowed elders.

In contrast, perceiving that support from persons other than the spouse is not available is generally more likely to be detrimental to widowed persons than to married ones, because the spouse of the married elders may provide sufficient support. For these theoretical reasons, although we expected that both social embeddedness and perceived social support might buffer the effects of conjugal bereavement on hospitalizations, deficits in perceived social support were expected to be more likely to show such effects.

Prior research lends some support to these expectations, although the evidence is sparse and not always consistent. Lack of perceived support has been proposed to be a major contributor to the bereaved's poor health (Sanders, 1993; Schuster & Butler, 1989; Stroebe & Stroebe, 1985). This conclusion is supported in Lund, Caserta, and Dimond's (1993) study of widowed and married elders. Measures of perceived support shortly after bereavement were more likely than social network indices to have positive effects on the self-rated physical and psychological health of widowed persons 2 years later. A reason suggested for this difference was that networks can include persons who are unsupportive or are sources of stress. However, Goldberg, Comstock, and Sioban's (1988) study of a representative local sample of aged widows found that both friendship network size and perceived closeness to children before widowhood predicted psychological distress 6 months after bereavement.

Ferraro, Mutran, and Barresi (1984) found that friendship support at baseline predicted positive changes in perceived health a year later for both widowed and married elders. Because the index of friendship support included both the number of such ties and the perceived

closeness of ties, the relative impacts of social embeddedness and perceived support could not be disentangled. Furthermore, over 90% of the widowed group were already widowed at baseline, thus their friendship resources were assessed after widowhood. Although the subgroup widowed during the study had the greatest decline in perceived health, the effect of their friendship resources prior to bereavement on changes in perceived health was not separately addressed.

Two prospective studies with appropriate comparison groups, but different measures of social resources, also did not find that resources had buffering effects on the adjustment of widowed persons. Norris and Murrell (1990) studied changes in ill health symptoms and functional disabilities over a 2-year period for widowed elders and matched married elders who either experienced no bereavement or experienced another type of bereavement. Social embeddedness at the first interview after bereavement did not predict subsequent changes in physical health for any subgroups, nor was there a significant decline in health among the widowed group. Wortman, Cohen, and Kessler (1993) studied a national sample of adults over 3 years. They report preliminary findings that social support assessed before the spouse's death did not predict changes in depression, even though widowed adults showed significant increases in depression as compared to married controls.

In sum, prior longitudinal studies provide conflicting evidence about the moderating effects of social embeddedness and perceived support on the bereavement-ill health linkage. Variations in research designs and measures may account for these inconsistencies: only social embeddedness was assessed in some studies, and others used combined measures of social embeddedness and perceived social support; social resources were variously measured before and after bereavement.

THE IMPORTANCE OF SOCIAL RESOURCES EXISTING BEFORE CONJUGAL BEREAVEMENT

Social resources besides the spouse that exist while the spouse is alive and similar resources that develop after bereavement both may be important, yet they are likely to have somewhat different impacts (Bass & Bowman, 1990). Bereaved elders who were not embedded in

other close relationships while the spouse was alive may experience a greater loss of purpose in life than those with such preexisting ties. After widowhood, new role relationships can provide new sources of meaning, but such ties take time to develop and cannot mitigate the initial stress on the marital role loss. Widowed elders who did not have other sources of support while the spouse was alive may believe they have fewer resources to help cope with bereavement than those who did have confidants other than the spouse. Perceptions of support from ties of long-standing may also enable bereaved elders to call on this support bank without serious threats to long-term reciprocity in their social exchanges (Antonucci & Jackson, 1990). In contrast, calling on supportive relationships that develop after bereavement may elicit feelings of dependency, which can be especially threatening to the elderly (Krause, 1987).

Social resources developed after widowhood and those available before bereavement are useful to test different buffering hypotheses. Resources available prior to widowhood are more appropriate to test possible moderating effects of resources on the linkage between conjugal bereavement and subsequent health (Cohen & Wills, 1985). Changes in social resources after bereavement, on the other hand, are more suitable to test the possible suppressor effects of the mobilization of resources on the linkage between conjugal bereavement and subsequent health. Because of our interest in the moderating effects of social resources on the conjugal bereavement-ill health linkage, the use of preexisting resources is more appropriate.

HOSPITALIZATION AS A SIGNIFICANT HEALTH OUTCOME

Being hospitalized overnight or longer was selected as the outcome to investigate for several reasons. It is an indicator of physical health problems whose reporting was assumed to be relatively unbiased by the psychological state of the respondent. This avoids the criticism that the dependent variable and the perceived support measures both reflect psychological distress (e.g., Arling, 1987). Additionally, any hospitalization is likely to reflect some serious health problem. Because nearly all American elders have Medicare coverage, accessibility of hospital services is less likely to be important than are medical

and social need factors (Osterweis et al., 1984). Medical needs are likely to indicate a significant illness, given Medicare's stringent monitoring of hospital stays. For these reasons, even though hospitalizations is only one health outcome that might be affected by conjugal bereavement, its use permits a rigorous test of the moderator buffering hypothesis.

High rates of hospitalization after conjugal bereavement have been reported (Perkins & Harris, 1990), but such effects have not always been found (Thompson, Breckenridge, Gallagher, & Peterson, 1984; Wolinsky & Johnson, 1992). In the present study, preliminary analyses did show that widowed elders had significantly more hospitalizations than married subjects.

GOALS OF THE PRESENT STUDY

To test the moderator buffering hypothesis for social resources as applied to conjugal bereavement, elders widowed over a 2-year period were compared with matched elders who remained married. Widowed elders with deficits in social embeddedness or in perceived social support were hypothesized to be at greater risk for hospitalizations than were widowed elders with adequate social resources or than married elders. However, deficits in perceived support were expected to be more likely to show such effects than were deficits in social embeddedness.

Methods

SUBJECTS AND SURVEY DESCRIPTION

Subjects were from the Established Populations for Epidemiologic Studies of the Elderly conducted at Duke University Medical Center. Blazer, Burchett, Service, and George (1991) present design and sampling details. Briefly, in 1985-1986 a four-stage randomized stratified technique was used to select a probability sample of the noninstitutionalized residents of the five-county Piedmont area of North Carolina who were at least 65 years of age. Counties were selected so as to yield approximately equal numbers of Black and non-Black and

of urban and rural respondents. The response rate for the baseline in-person interview was 80% ($N = 4,162$), including proxies for 162 elders whose physical or mental conditions made them unable to participate. About 1 year later, and again 2 years after the personal interview, over 95% of the original respondents or an informed proxy participated in brief telephone interviews.

Subjects were selected from those who were married at the baseline interview, responded to that interview on their own behalf, self-identified as either Black or White, and participated themselves or via a proxy in the telephone interviews ($n = 1,498$). Two widowed groups were identified: Cohort 1 was widowed between the baseline and the first telephone interview ($n = 43$); Cohort 2 was widowed between the first and second telephone interview ($n = 43$). An equal number of elders ($n = 86$) who remained married through the second telephone interview were randomly selected from all those matched to each widowed person at baseline on sex, race, urban/rural residence, age (within 2 years), and years currently married (within 5 years).

The two cohorts of widowed subjects were combined and treated as a synthetic cohort of widowed elders (Campbell & Hudson, 1985), and all matched married subjects were combined into a synthetic cohort of married elders. The dummy variable for Widowed Status was coded 1 for all those who became widowed and 0 for all those who remained married.

Within each group, the mean age at baseline was 72.6 years, 69% were females, 52% were White, and 62% were urban residents. The mean years currently married was slightly higher for the widowed (43.3) than for the married (40.9) respondents.

DEPENDENT VARIABLE

The dependent variable was change in the number of overnight hospital admissions. Each interview included detailed questions about all overnight hospital admissions in the preceding year. Two periods were compared: Time 1 hospitalizations were those reported for the year before the baseline interview, when all subjects were married and all the measures of social resources were obtained; Time 2 hospitalizations were those that occurred after bereavement for the widowed

elders, and during a comparable period for their matched controls. Specifically, the measure of Time 2 Hospitalizations for widowed Cohort 1, and their married controls, was the sum of the number of hospitalizations reported in the year before the first telephone interview and in the year before the second telephone interview. For the widowed Cohort 2, and their matched controls, the Time 2 Hospitalizations variable was based on the number of hospitalizations in the year before the second telephone interview.

To reduce skewness, the Time 1 and Time 2 measures were truncated into 0, 1, or 2 or more hospitalizations. For Time 1, $M = 0.15$ and $SD = 0.45$; 88.3%, 7.6%, and 4.1% were in each category, respectively. For Time 2, $M = 0.28$ and $SD = 0.58$, and the distribution was 77.9%, 15.7%, and 6.4%. The Time 1 and Time 2 Hospitalizations measures were significantly correlated, $r = .16(170)$, $p < .05$.

The dependent variable was change in hospitalizations from Time 1 to Time 2. The widowed and married groups did not differ significantly in Time 1 Hospitalizations ($M = 0.19$ and 0.13 for the widowed and married, respectively). Nor were there solid theoretical reasons to expect elevated hospitalization rates in the year preceding bereavement. Nonetheless, change in hospitalizations was used to provide a stringent test of the moderator buffering hypothesis.

SOCIAL RESOURCE VARIABLES AND SOCIAL RISK FACTORS

Table 1 describes the six social resources measured at the baseline interview when all subjects were married, and six dummy variable social risk factors. For dummy variables based on multiple items (i.e., Satisfaction with Support and Number of Close Contacts), the risk category included as close to 20% of the total subjects as was possible. The risk category for other dummy variables indicated the absence of the social resource.

The perceived social support risk factors were No Close Friend, No Close Relative, and Dissatisfied with Support. Each was based on a variable that indexed qualitative evaluations of relationships perceived as supportive (Number of Close Friends, Number of Close Relatives, and Satisfactory Support). Similar measures have a general

Table 1
Description of Social Resource Variables and Social Risk Factors

Social Resource Variables	Social Risk Factors[a]
Number of Close Friends = no. of friends who you feel close to, at ease with, can talk with about private matters, or can call on for help. Range = 0-10.	No Close Friend 12% at risk
Number of Close Relatives = no. of relatives, excluding children and spouse, who you feel close to, at ease with, can talk with about private matters, or can call on for help. Range = 0-10.	No Close Relative 11% at risk
Satisfaction with Support = total for 6 items: satisfactory amount of contact with children, satisfactory amount of contact with relatives and friends, satisfactory receipt of instrumental support, satisfactory relations with family and friends, availability of friends and family as confidants, availability of family and friends for aid in time of trouble. Range = 6-13.	Dissatisfied with Support Score < 10 18% at risk
Number of Close Contacts = no. close friends and close relatives seen at least monthly. Range = 0-14 or more.	Few Close Contacts < 3 Close Contacts 25% at risk
Number of Child Contacts = no. of children seen at least monthly. Range 0-9.	No Child Contacts 30% at risk
Number of Living Children. Range = 0-8 or more.	No Child 10% at risk

a. All risk factors were dummy variables coded 1 for those at risk.

beneficial effect on the health of elders even when other risk factors are controlled (e.g., Blazer, 1982).

The social embeddedness risk factors were Few Close Contacts, No Child Contacts, and No Living Child. Each was based on a variable that indexed relatively objective aspects of social connections (Number of Close Contacts, Number of Child Contacts, and Number of Living Children). Deficits in similar indices predict morbidity and mortality (e.g., Blazer, 1982; Seeman et al., 1987).

CONTROL VARIABLES

To control for possible effects of the pooling of the two cohorts of widowed elders, a Years at Risk variable was created. This variable was coded 2 for widowed Cohort 1, those widowed between the baseline

interview and the first telephone interview, and for their married controls. Years at Risk was coded 1 for widowed Cohort 2, those widowed between the first and second telephone interview, and for their controls. Years at Risk was controlled in all analyses because the Time 2 Hospitalizations measure was based on different periods for the two cohorts. For widowed Cohort 1 and their married controls, Time 2 Hospitalizations covered a 2-year risk period that coincided with the postbereavement period. For widowed Cohort 2 and their married controls, however, Time 2 Hospitalizations covered the 1-year postbereavement period for this widowed cohort. Years at Risk had a significant positive correlation with Time 2 hospitalization, $r = .15(170)$, $p < .05$.

Education and Poor Perceived Health at baseline were also always controlled. Both had significant correlations with Time 2 Hospitalizations and are important predictors of physical health in other research.

Education (coded 0-17 or more years of schooling) was significantly negatively correlated with Time 2 Hospitalizations, $r = -.23(170)$, $p < .01$. Widowed elders had somewhat fewer years of education than married ones, $M = 8.60$ and $SD = 4.00$ for the widowed and $M = 9.74$ and $SD = 4.10$ for the married, $p = .07$. Education is viewed as an indicator of socioeconomic status, which has often been shown to affect morbidity and mortality among elders (e.g., House, Kessler, Herzog, & Mero, 1991).

Poor Perceived Health was assessed by the question, "Overall, how would you rate your health, as excellent, good, fair, or poor?" (Coded 1 = *excellent* to 4 = *poor.*) This index had a significant positive correlation with Time 2 Hospitalizations, $r = .20(170)$, $p < .01$. Widowed elders and married controls had similar views of their health at baseline, $M = 2.43$ and $SD = 0.93$ for widowed and $M = 2.29$ and $SD = 0.91$ for married, $p > .10$. Perceived health has been shown to have independent effects on subsequent mortality among the elderly (e.g., Idler & Kasl, 1991; Rakowski, Mor, & Hiris, 1991).

ANALYSIS PLAN

Time 2 Hospitalizations was separately regressed on the six social resources. Each hierarchical series tested the effects of one social

resource and the interaction of its risk factor with widowed status. Each interaction term contrasted widowed elders with one social risk factor with all other subjects (e.g., in the Widowed × No Close Friend term, widowed persons with no close friend were coded 1 and all others were coded 0).

In each series, the first model contained Time 1 Hospitalizations; as a result, coefficients in subsequent models indexed effects on changes in hospitalizations from baseline to Time 2 (Kessler & Greenberg, 1981). Model 2 added the Widowed Status dummy variable and the control variables; the main effect for Widowed Status tested whether becoming widowed predicted changes in hospitalizations, net of controls. Model 3 added one social resource variable (e.g., Number of Close Friends); the main effect for the social resource tested whether that resource predicted changes in Hospitalizations, net of Widowed Status and controls. Model 4 added an interaction term for Widowed × one risk factor (e.g., the Widowed × No Close Friend dummy); the interaction term tested whether widowed individuals who lacked the resource (e.g., had no close friend) had distinctive changes in hospitalizations. A significant positive coefficient would support the hypothesis that widowed elders with deficits in preexisting social resources are at greater risk for subsequent hospitalizations.

Additional regressions (not presented) tested gender effects. There is mixed evidence for the suggestion that widowers have poorer health outcomes than widows, especially when morbidity rather than mortality is the assessed outcome (Ferraro, 1989; Gallagher-Thompson, Futterman, Farberow, Thompson, & Peterson, 1993; Lund et al., 1993; Stroebe et al., 1993; Verbrugge, 1979). Similarly, evidence that deficits in social resources are more problematic for men than for women is inconsistent (Forster & Stoller, 1992; House et al., 1988). Nonetheless, we examined whether sex interacted with either Widowed Status or the social risk factors in predicting changes in Hospitalizations. None of these interactions was significant.

The failure to find interactions with sex is not surprising, given the mixed evidence noted above on gender differences among the elderly in the health effects of conjugal bereavement and social resources. Additionally, the present study avoided two potential biases noted by Umberson, Wortman, and Kessler (1992), which may increase the

observations of sex differences in some prior cross-sectional studies. A cross section of currently widowed elders may include more healthy women than healthy men because (a) widowed elders who remarry are excluded, men have a higher remarriage rate than women, and remarriage may be more likely for healthy than unhealthy men; and (b) the men are likely to include a larger proportion of the recently bereaved than are the women because women live longer and poor health is more common among recent than long-term widowed elders. In the present sample, none of the persons who became widowed over the 2-year study period had remarried, so there was no remarriage selection bias. Nor did the present sample of men and women differ in how long they were widowed. About the same percentage of men were in the cohort widowed up to 2 years (30%) and the one widowed no more than 1 year (33%).

Results

Widowhood was not a net risk factor for increases in subsequent hospitalizations. The main effect for being widowed was never significant, either in models including only control variables or in models also including social resources. All control variables showed at least marginally significant net effects in the expected directions. Widowed and married elders whose changes in hospitalizations were assessed over a 2-year risk period (corresponding to the postbereavement period for the widowed group) showed larger increases in hospitalizations than those for whom changes were assessed over a 1-year period. Fewer years of education and poorer self-evaluations of health at baseline were associated with larger increases in hospitalizations. We next consider whether widowed elders with deficits in social resources were at particular risk for increased numbers of hospitalizations.

DEFICITS IN PERCEIVED SOCIAL SUPPORT AS RISK FACTORS FOR HOSPITALIZATIONS

The data indicate partial support for the hypothesis that deficits in perceptions of nonspousal social support before bereavement exacerbate the effects of widowhood on hospitalizations, and no evidence

that perceived support had a main effect. Table 2 summarizes these data for the perceived social support variables (Number of Close Friends, Number of Close Relatives, or Satisfaction with Support) and the interaction terms with widowed status (Widowed × No Close Friend, Widowed × No Close Relative, or Widowed × Dissatisfied with Support). None of the perceived support variables had a significant net main effect on changes in hospitalizations (Model 3). However, among widowed persons, a deficit in preexisting perceived support increased the likelihood of subsequent hospitalizations. This is seen most clearly in panel A of Table 2, where the interaction term for Widowed × No Close Friend in Model 4 is significant. Similar trends are shown in panels B and C; for the Widowed × No Close Relative interaction term, $p = .06$ and for the Widowed × Dissatisfied with Support interaction term, $p = .07$.

DEFICITS IN SOCIAL EMBEDDEDNESS AS RISK FACTORS FOR HOSPITALIZATIONS

The data do not support the prediction that a lack of social embeddedness before bereavement exacerbates the effects of widowhood on hospitalizations (tables are not included). None of the social embeddedness risk factors significantly interacted with Widowed Status in Model 4 (Widowed × Few Close Contacts, Widowed × No Child Contacts, Widowed × No Child). Nor did any of the Model 3 regressions show any significant main effects for the social embeddedness variables (Number of Close Contacts, Number of Contacts with Children, or Number of Children).

Discussion and Conclusions

This study contributes to the identification of factors that explain the variability in how elders respond to widowhood. Conjugal bereavement did not have general deleterious effects on subsequent increases in hospitalizations when relevant characteristics were controlled. Instead, bereavement was distinctively associated with increased risks of hospitalizations among elderly survivors who did not perceive sources of social support besides the spouse. Widowed elders

Table 2
Regressions on Time 2 Hospitalizations

Variable	*r*	Model 1		Model 2		Model 3		Model 4	
		b	Beta	*b*	Beta	*b*	Beta	*b*	Beta
A. Time 1 Hospitalizations	.16*	.20	.16*	.11	.09	.11	.09	.08	.07
Widowed	.15*			.13	.11	.13	.11	–.07	.06
Years at Risk	.15*			.13	.11	.13	.11	.12	–.10
Education	–.24**			–.02	–.16*	–.02	–.16*	–.02	–.15
Poor Health	.21**			.08	.13	.08	.13	.09	.14
Number of Close Friends	–.02					.00	.02	.01	.09
Widowed × No Close Friend	.22**							.40	.19*
Intercept		.26		.42		.40		.31	
R^2			.02*		.11**		.11**		.14**
Change in R^2					.09**		.00		.03*
B. Time 1 Hospitalizations	.16*	.20*	.16*	.12	.10	.11	.09	.11	.09
Widowed	.15*			.13	.11	.13	.11	.09	.08
Years at Risk	.16*			.14	.12	.13	.11	.12	.10
Education	–.22**			–.02	–.14	–.02	–.14	–.02	–.12
Poor Health	.20**			–.08	.13	.09	.15	.10	.15
Number of Close Relatives	.09					.02	.10	.03	.14
Widowed × No Close Relative	.16*							.38	.15
Intercept		.25		.41		.29		.21	
R^2			.03*		.11**		.12**		.14**
Change in R^2					.08**		.01		.02
C. Time 1 Hospitalizations	.13	.17	.13	.10	.08	.09	.07	.07	.05
Widowed	.16*			.15	.13	.16	.13	.10	.09
Years at Risk	.14			.12	.11	.14	.12	.12	.10
Education	–.22**			–.02	–.15	–.02	–.14	–.02	–.13
Poor Health	.20**			.09	.13	.08	.12	.08	.12
Satisfaction with Support	–.16*					–.05	–.13	–.02	–.06
Widowed × Dissatisfied with Support	.26**							.35	.16
Intercept		.27		.39		.98		.63	
R^2			.02		.11**		.12**		.14**
Change in R^2					.09**		.02		.02

Note. Due to missing data, *n*s vary between 164-169.
*$p \leq .05$; **$p \leq .01$.

were especially vulnerable if prior to their spouse's death they did not have any friend other than the spouse with whom they felt close, with whom they could talk about private matters, or could call on for help. The absence of any close relative (excluding children and spouse) and dissatisfaction with support before bereavement also may have put widowed persons at risk. In contrast, limited ties to persons other than the spouse did not increase hospitalization risks for bereaved elders. Social isolation while the spouse was alive was not especially problematic for those subsequently widowed, whether indexed by no weekly contact with friends, infrequent contacts with relatives or children, or being childless. Furthermore, neither the lack of perceived support from persons other than the spouse nor the absence of social embeddedness with such persons had deleterious affects on the subsequent hospitalizations of widowed and married elders.

These findings extend prior research in a number of ways. Like other stressors, conjugal bereavement among the elderly has now been shown to be more likely to be buffered by perceptions about support than by social network characteristics (Blazer, 1982; Cohen & Wills, 1985; House et al., 1988). Furthermore, perceived support's buffering effects were shown for hospitalizations, which is a relatively objective indicator of serious physical health problems. The findings also extend support for the idea that resources are most likely to buffer stress when the support available matches the need created by the stressor (Wallston, Alagna, DeVillis, & DeVillis, 1983). The death of the spouse may create a shortage of supportive interchanges that help prevent and deal with health problems. Believing one has a supportive close friend or relative may buffer some of the health consequences of bereavement because the survivor expects such persons to help compensate for the loss of support from the spouse.

Although the specific ways that perceptions about preexisting supportive relationships reduce bereavement's impact on hospitalizations could not be determined, the pattern of results suggests further research directions. As noted earlier, perceptions of support can affect the initial distress experienced by survivors, the coping efforts they make, and the support they receive. The fact that the most powerful effect was found for close friendships suggests that the major buffering effect is not linked to the provision of substitute health care, as this is

more likely to be provided by close relatives (Cantor & Little, 1985). Support from friends may be especially important in two other ways. First, unlike close relatives, friends' own distress over the death may not interfere with their helping the widowed elders cope with their distress (Gottlieb & Wagner, 1991). Additionally, elders who lack a close friend may be left with no close intragenerational tie after the death of the spouse, and intragenerational ties serve distinctive functions for the well-being of the elderly (Hochschild, 1978). Efforts to pinpoint more precisely the ways in which perceptions about the supportiveness of friends and relatives differentially affect widowed elders would be valuable.

Other issues that could not be resolved in the present study are also important to address. The effects of perceived support as a buffer against other health outcomes besides hospitalizations are important to determine because of the multidimensional nature of physical health (Liang, 1986). An analysis of the time it takes for widowhood to affect health also would be valuable because we know relatively little about how long it takes for ill health outcomes to appear after severe stress and how persistent such effects are (Krause, 1989). The possible impact on morbidity of perceived support from children is also relevant, given evidence that perceived parent-child solidarity after widowhood affects mortality among elders (Silverstein & Bengtson, 1991).

The results of this study are nonetheless noteworthy because certain methodological issues that have limited prior research were addressed. The effects of both perceived social support and social embeddedness were tested, whereas much prior research has been criticized as dealing with one or the other concept or with both intertwined (Auslander & Litwin, 1991). The social resources were assessed before the occurrence of the stressor. This provided a more adequate test of the moderator version of the stress-buffering hypothesis because these measures could not reflect efforts by the widowed elders to enhance their resources or by their networks to respond to the distress or the health problems of the bereaved (Cohen & Wills, 1985). The outcome measure is not subject to the criticism (e.g., Arling, 1987) that it reflects the same underlying dimension as the measures of perceived support. Possible differences in the health of married elders who did and did not become widowed were controlled by the prospective

design and the matching on key variables. Neither respondents nor interviewers were aware of a focus on widowhood, which other scholars have identified as an important way to avoid eliciting socially desirable responses to being widowed (e.g., Murrell, Himmelfarb, & Phifer, 1988).

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