# Spousal Loss, Children, and the Risk of Nursing Home Admission

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***Objectives.*** Informed by a life course perspective, this study investigates the effects of spousal loss and availability of adult children on elderly husbands' and wives' risk of nursing home entry.

***Methods.*** Based on longitudinal data from the Health and Retirement Study, we studied 2,116 couples who were community residents in 1998. We estimate proportional hazards models for husbands' and wives' duration to first nursing home admission during 8 years of follow-up.

***Results.*** Overall, 438 (20.7%) husbands and 382 (18.1%) wives were institutionalized, and 362 (17.1%) husbands and 701 (33.1%) wives lost their spouse. Accounting for measured covariates, the risk of nursing home entry doubled for men following spousal death, but was unchanged for women. Results indicate that adult children reduced wives' risk of nursing home admission regardless of husbands' vital status, but buffered husbands' risk only after the death of their wives. We uncover suggestive evidence of parent–child gender concordance in children's buffering effect of widowed parents' risk of institutionalization.

***Discussion.*** Our findings are consistent with gender variations in spousal caregiving and in husbands' and wives' relative reliance on care from a partner and children. This study provides new evidence on the relationship between institutionalization and family structure among married elderly persons.

***Key Words:*** Caregiving—Family structure—Gender—Nursing home use—Life course.

THE aging of the baby boom generation and the resulting substantial increase in the size of the older population are expected to result in an unprecedented surge in demand for long-term care (LTC) over the next few decades. Among the various providers of formal LTC, nursing homes have a unique importance because they generally cater to severely disabled elderly persons who require extensive assistance with medical and basic daily needs. Furthermore, nursing home care is the most expensive form of LTC and its cost is overwhelmingly assumed by public assistance programs, primarily Medicaid (National Center for Health Statistics, 2007).

Presently, 3.5% of the 36.8 million Americans 65 years and older reside in nursing homes (National Center for Health Statistics, 2007). Consistent predictors of nursing home admission include sociodemographic and background factors such as increased age and Caucasian ethnicity/race. Other important risk factors reflect the health and functional dependence of older adults, such as difficulty in performing activities of daily living (ADLs) and instrumental activities of daily living (IADLs) or cognitive impairment (Gaugler, Duval, Anderson, & Kane, 2007). In addition, family members are an important determinant of the risk of nursing home use (Aykan, 2003; Coward, Netzer, & Mullens, 1996; Freedman, 1996; Freedman, Berkman, Rapp, & Ostfeld, 1994; Himes, Wagner, Wolf, Aykan, & Dougherty, 2000). Kin are critical in providing assistance to elderly disabled

relatives (National Alliance for Caregiving and AARP, 2004; Wolff & Kasper, 2006) and thereby enable the substitution of informal care services for institutional care (Charles & Sevak, 2005; Freedman). Consistent evidence shows that spouseless elderly persons have an elevated risk of nursing home use, even after adjusting for health and disability status, and there is some indication that adult children reduce their parent's risk of institutionalization (Gaugler et al., 2007; Miller & Weissert, 2000).

Although there is some consensus regarding the protective effect of family caregivers on the risk of nursing home entry, there are several limitations in the existing research. In analyzing the relationship between family structure and the risk of nursing home use, few prior studies have investigated the protective effects of kin availability among elderly husbands and wives. Relying on data from respondents of all marital statuses, researchers have contrasted the risk of institutionalization between married and unmarried elderly persons (Banaszak-Holl et al., 2004; Coward et al., 1996; Harris & Cooper, 2006; Himes et al., 2000). Because the category of spouseless elderly persons includes not only widow(er)s, but also never married and divorced elderly, an important limitation of this approach is its inability to capture the independent effect of spousal loss on husbands' and wives' risk of nursing home use. Yet, the death of a spouse at older ages is not a rare event, particularly for women (Moss et al., 2001). Furthermore, the existing literature has

examined the role of adult children in limiting elderly persons' risk of nursing home use *controlling for* marital status. Little is known regarding adult children's effect on their married parents' risk of nursing home admission, particularly after an elderly parent loses his or her spouse. Finally, information about gender variations in the protective effect of kin availability on the risk of nursing home institutionalization is limited. Gender is a key dimension of social organization, which shapes marital partners' likelihood of care receipt and is thus likely to affect the buffering effect of kin availability on husbands' and wives' risk of nursing home use.

Addressing these three shortcomings, we present analyses that contrast elderly husbands' and wives' risk of nursing home admission following spousal loss. In addition, this study examines the reducing effect of child availability on married parents' risk of institutionalization, with particular attention to adult children's role relative to the vital status of a parent's spouse. Finally, we investigate the existence of parent–child gender concordance in sons' and daughters' influence in buffering the elderly persons' risk of institutionalization. Based on nationally representative longitudinal data on couples from the Health and Retirement Study (HRS), we followed community-dwelling marital partners over 8 years and separately modeled the effect of family structure on husbands' and wives' risk of nursing home use. In contrast to prior research, this study draws upon a theoretical framework that integrates assumptions from the life course perspective with prior knowledge of gender variations in married elderly persons' receipt of care within the marital context and across generations.

## Past Research on Family Structure and the Risk of Nursing Home Entry

Because community residence is generally preferred over nursing home residence, institutional care is typically initiated when the balance between sources of support available in the community and an elder's caregiving needs is upset. Prior research has identified the presence of a spouse as one of the strongest and most consistent determinants of nursing home admission (Freedman et al., 1994; Miller & Weissert, 2000), and there is suggestive evidence that spouses are slightly more protective for men than for women (Freedman, 1996). In a recent review of survival analyses examining predictors of time to nursing home admission in community-dwelling older adults, Gaugler and colleagues (2007) report that the hazard of nursing home admission for married elderly persons is on average 90% of the hazard for unmarried elderly persons. Other researchers have reported stronger protective effects of having a spouse on the risk of nursing home admission, with reduction of up to 40% in the hazard of community to nursing home transfer (Freedman). In contrast, evidence for the effect of having children on the risk of nursing home use is inconsistent. Several studies find that

an increase in the number of children is associated with a reduction in the risk of nursing home admission (Coward et al., 1996; Cutler, Sheiner, & Wise, 1994; Headen, 1993). Other studies conclude that having daughters rather than sons is associated with a reduced risk of nursing home admission (Freedman), and that childlessness, particularly the absence of daughters, is an important risk factor for nursing home use only among elderly women (Aykan, 2003; Himes et al., 2000). In the only study to contrast adult children's effect on the risk of nursing home admission among married and unmarried elderly persons, Freedman finds no evidence that sons and daughters have a greater effect on the likelihood of institutionalization among unmarried elderly persons than among married elderly persons.

## Organizing Framework and Research Focus

The theoretical framework informing our approach to the relationship between husbands' and wives' family structure and their risk of nursing home admission relies foremost on two central concepts of life course theory: the principle of life trajectory and the concept of linked lives (Elder, Johnson, Crosnoe, Mortimer, & Shanahan, 2003; Settersten, 2003). A trajectory charts the course of an individual's experiences in specific domains over time. Trajectories are marked by life events and by transitions that place individuals in a new environment, lead to changes in an individual's state, or result in the acquisition or the relinquishing of roles. We conceptualize spousal loss as a central transition in elderly persons' lives, marking the end of a sequence of marital partnership during which personal support from a spouse is available. Our focus is on understanding how spousal loss and subsequent changes in the availability of informal caregivers shape the transition in residential location from community to nursing home. Rather than conceptualizing widowhood as a fixed state, we account for the changing nature of marital status by following married partners over time and assessing the effects of spousal loss on elderly men's and women's risk of nursing home use.

According to life course theory, individual lives are interdependent with the lives of others and individual trajectories are shaped by such ties (Hagestad & Settersten, 2003). Therefore, an understanding of life course transitions such as an older disabled person's institutionalization into a nursing home requires consideration of the availability of social ties and of life events and circumstances taking place in linked lives. Beyond evaluation of the consequences of spousal loss, the life course perspective calls for an exploration of the effects of spousal characteristics such as age and health conditions that might determine a spouse's caregiving ability and independently influence a partner's risk of institutionalization. Furthermore, the principle of linked lives emphasizes changes in the salience of intimate ties, as individuals move through time and experience life transitions (Settersten, 2003).

In addition to its emphasis on life trajectories and linked lives, the life course perspective highlights the gendered nature of life experiences (Settersten, 2003). Prior studies indicate that married elderly persons' care receipt from a spouse and from children is strongly influenced by gender (Stoller, Dwyer, & Coward, 1992), suggesting that the effects of kin availability on the risk of nursing home use may vary between husbands and wives.

Despite providing a general framework for examining the effects of spousal loss and adult children on married elderly persons' risk of nursing home admission, the life course perspective does not suggest specific hypotheses about the influence of family structure on the use of nursing home care. We thus rely on selected assumptions and findings from prior research for hypothesis development. These include findings about gender variability in the provision of informal care within the marital context, gender differences in married elderly persons' reliance on care from adult children and same-gender preferences in parent–child care.

*Gender variations in spousal caregiving.*—Among married elderly persons, spouses typically bear the primary responsibility for their partner's care (Stoller et al., 1992; Stoller, Miklowski, Szinovacz, & Davey, 2008). Prior research suggests that husbands receive more spousal care than wives, including more assistance with ADLs and IADLs (Spitze & Ward, 2000). Using a nationally representative sample of married disabled elderly persons, Katz, Kabeto, and Langa (2000) find that among moderately disabled spouses, wives received on average 31% fewer hours of informal care from spouses alone than husbands. Furthermore, wives continue to provide care longer and at greater levels of disability than husbands (Miller, 1990) and they strongly reduce their husband's risk of nursing home admission (Freedman et al., 1994). Married women are more likely to become institutionalized than married men (Stoller et al., 2008), suggesting that husbands may not be as effective in reducing a spouse's risk of nursing home admission. If this is indeed the case, we hypothesize that the excess risk of nursing home institutionalization following spousal loss is greater among husbands than among wives (Hypothesis 1).

*Husbands' and wives' reliance on care from adult children.*—In general, adult children's role as caregivers to elderly parents becomes particularly salient when a spouse is no longer available. However, married elderly persons also receive significant amounts of care from adult children, particularly daughters (Katz et al., 2000). There is evidence of important gender variations in husbands' and wives' relative reliance on care from a spouse and care from adult children (Allen, 1994). Whereas husbands rely very heavily on their wives for care and relatively little on adult children, wives receive a substantial proportion of their care from adult children in addition to spousal care (Katz et al.). Consistent with such gender differences and with adult

children's preeminent role as caregivers to spouseless elderly persons, we expect adult children to reduce wives' risk of nursing home admission whether or not a husband is present (Hypothesis 2). In contrast, among husbands, we hypothesize a buffering effect of child availability on widowers' excess risk of nursing home admission (Hypothesis 3).

*Same-gender preferences in intergenerational care.*—Prior research suggests an inclination toward gender consistency in the provision of informal care across generations (Davey & Szinovacz, 2008; Freedman, 1996). Hypothesized explanations include the strength of the mother–daughter tie and parent's reluctance for close personal contact with children of opposite gender required by such activities as bathing, dressing, or toileting. We thus expect adult children's hypothesized effect in limiting widowed parent's risk of nursing home use to be contingent on gender concordance between parent and child (Hypothesis 4; McNally & Wolf, 1996).

## METHODS

The HRS is a prospective panel survey conducted by the Institute for Social Research at the University of Michigan (Juster & Suzman, 1995). The goal of the study is to investigate the implications of health changes at older ages for economic well-being, family dynamics, and reliance on formal and informal support systems. In 1998, the original HRS sample was merged with the sample of Asset and Health Dynamics Among the Oldest Old (AHEAD) respondents, and combined with two additional samples (Children of the Depression Era [CODA] and War Babies, [WB]) making the data broadly representative of the entire household population aged 50 and older. The analytical sample consisted of couples where both partners were community residents aged exactly 65 or older at the time of the 1998 HRS interview. Using retrospective questions from HRS biennial data (2000, 2002, 2004, and 2006) concerning the timing, number, and duration of nursing home stays since the previous wave, we reconstituted monthly histories of nursing home admissions between 1998 and 2006. Separately for husbands and for wives, we conducted survival analyses of the timing of the first observed nursing home admission. For each partner, we examined the effect of spousal death and child availability on the risk of institutionalization.

### Analytical Sample

The 1998 HRS interviewed 2,414 married or partnered couples where both members were aged exactly 65 or older and resided in the community. From these, we excluded 118 couples for whom either partner had been lost to follow-up by the time of the 2000 HRS interview because it was not possible to reconstitute one or both partner's nursing home history during the 1998–2000 interval. We further exclude another 180 couples where a partner had missing values on

Table 1. Sample Characteristics of Spouses 65 Years or Older at the Beginning of the Study Period, by Gender: Health and Retirement Study, 1998[a]

|  | Husbands | Wives |
|---|---|---|
| Number of children | 2.92 (0.06) | 2.86 (0.06) |
| Number of sons | 1.44 (0.03) | 1.41 (0.03) |
| Number of daughters | 1.47 (0.04) | 1.45 (0.03) |
| Age | 75.24 (0.14) | 72.80 (0.14) |
| Race/ethnicity |  |  |
| Non-Hispanic White | 90.19 | 89.48 |
| Hispanic White | 3.24 | 3.54 |
| Black | 4.94 | 5.07 |
| Other | 1.63 | 1.92 |
| Education |  |  |
| Less than high school | 32.94 | 23.79 |
| High school | 29.31 | 41.21 |
| Some college | 16.36 | 20.00 |
| College graduate | 21.39 | 15.00 |
| Prior nursing home use | 1.50 | 1.06 |
| Poor self-reported health | 11.28 | 9.47 |
| Disability |  |  |
| 0 ADL | 83.62 | 83.77 |
| 1–2 ADL | 11.92 | 11.82 |
| 3+ ADL | 4.45 | 4.41 |
| 0 IADL | 84.60 | 87.79 |
| 1–2 IADL | 11.54 | 8.51 |
| 3+ IADL | 3.86 | 3.70 |
| Cognitive function |  |  |
| Low | 5.53 | 5.17 |
| Moderate | 65.01 | 57.20 |
| High | 29.46 | 37.63 |
| Health Insurance coverage |  |  |
| Medicaid | 3.69 | 3.57 |
| Long-term care insurance | 11.41 | 10.86 |
| Couple's net worth |  |  |
| Low |  | 13.45 |
| Middle |  | 33.98 |
| High |  | 52.57 |
| Sample size | 2,116 | 2,116 |

*Notes*: [a]Percentages shown for dummy variables; means shown for continuous variables; standard errors are in parenthesis. ADL = activities of daily living; IADL = instrumental activities of daily living.

one or more of the variables considered in the proportional hazards models. The final analytical sample consisted of 2,116 couples. Due to variation in the month of the 1998 and 2006 HRS interviews, death, and loss to follow-up, there is considerable variability in the duration of observation between sample members. Marital partners were observed between 2 and 108 months. Table 1 presents the characteristics of husbands and wives at risk of first observed nursing home admission at the beginning of the observation period. The mean number of children per couple is 2.9. By the 2006 interview, 438 (20.7%) husbands and 382 (18.1%) wives had been institutionalized into a nursing home and 362 (17.1%) husbands and 701 (33.1%) wives had lost their spouse.

### Measures

*Outcome.*—Determination of the timing of first observed admission to a nursing home is based on data from the main interviews as well as data from exit interviews conducted with relatives or friends, in cases where a respondent had died. Predeath nursing home histories are critical because many nursing home residents are admitted for terminal care (Weitzen, Teno, Fennell, & Mor, 2003). In a few cases, a respondent was reported to have died in a nursing home, but information on the exact timing of institutionalization was missing. For these respondents, we impute the date of admission based on the total number of months or days they were reported to have remained institutionalized. Imputed cases represent 11 (1.3%) of the 820 husbands and wives in our sample who had a nursing home stay during the observation period. Because the HRS does not ask about the overall ranking of reported nursing home episodes, our measure of first observed institutionalization encompasses respondents' first or subsequent nursing home stays. Prior research has shown that most individuals who utilize nursing home care do so a single time (Freedman, 1996; Murtaugh, Kemper, Spillman, & Carlson, 1997). However, past institutionalization substantially increases the likelihood of subsequent nursing home use (Gaugler et al., 2007). We include an indicator of nursing home care in the 2 (HRS, CODA, and WB subsamples) or 3 (AHEAD subsample) years preceding the 1998 interview.

*Family structure.*—The primary variables of interest are measures of a spouse's vital status and of adult child availability. We obtained monthly data on the timing of a spouse's death from exit interviews or from linked National Death Index data when proxy data were not available. Following previous research, we measure child caregiving availability as a respondent's number of living, biological offspring (Aykan, 2003; Coward et al., 1996; Himes et al., 2000). To investigate the relative importance of children of particular gender, additional models include each marital partner's number of sons and daughters. In the vast majority of cases, both members of a couple have an identical number of biological children. However, for some couples (18.1%), one or more of a partner's biological children are stepchildren to their spouse.

*Control variables.*—The risk of nursing home admission can respond to many factors besides availability of informal caregivers. We base our choice of control variables on previously identified socioeconomic and health predictors of nursing home entry (Gaugler et al., 2007). Education (less than high school, high school, some college, and college graduate), race/ethnicity (non-Hispanic White, Hispanic White, Black, and other), total net worth and health insurance status are entered as demographic and socioeconomic controls. Total net worth includes the couple's current assets and home equity. Based on the entire HRS sample, indicator variables were created corresponding to the low, middle, or high net worth terciles, with the lowest tercile as the reference category. Dummy variables indicate Medicaid

and LTC insurance coverage. Medicare coverage is not included as it is virtually universal in our sample.

We include a measure of self-reported poor health (vs fair, good, very good, or excellent) to account for husbands' and wives' general health status. Functional status measured the presence and severity of ADL (difficulty dressing, walking, bathing, eating, transferring, and toileting) and IADL (difficulty preparing meals, shopping, using the phone, taking medicines, and managing money) limitations. For both measures of disability, we include indicator variables of one to two disabilities and three or more disabilities. Our measure of dementia identifies three levels of cognitive function: low, moderate, and high (for details see Walsh, Wu, Mitchell, & Berkman, 2003). For self-respondents, determination of cognitive status was based on the Telephone Interview for Cognitive Status, a validated cognitive screening instrument patterned on the Mini-Mental State Examination, but designed specifically for population studies (Herzog & Wallace, 1997). In cases where a subject was unwilling or unable to respond, we used proxy's assessments of the sample member's memory, ability to be left alone, propensity to hallucinate, tendency to get lost in familiar places, and tendency to wander off (Langa et al., 2001).

*Spousal characteristics.*—In order to account for a spouse's ability to provide care, in addition to a respondent's own characteristics, the models account for measures of spousal age, disability, cognitive status and self-reported health. Consequently, the effect of a spouse's death on their partner's risk of nursing home transfer is independent of previous spousal health and disability conditions.

*Analytical Strategy*

Separate multivariate proportional hazards models were used to estimate husbands' and wives' hazards of institutionalization. We assume that the risk of nursing home admission begins when an individual reaches exact age 65 (Freedman, 1996). Therefore, the outcome variable is the duration between the month of a respondent's 65th birthday and the month of entry into a nursing home. Although many do not experience health decline or loss of function until a later age and individual conditions vary at age 65, it is commonly considered the starting point for the study of events that occur during old age. Unlike most longitudinal studies of the risk of institutionalization, which use the start of the study as the point of origin for the risk of nursing home use (Banaszak-Holl et al., 2004; Bharucha, Pandav, Shen, Dodge, & Ganguli, 2004; Harris & Cooper, 2006; Lachs, Williams, O'Brien, & Pillemer, 2002), this approach allows us to focus on the likelihood of entering a nursing home at each age. Because the dependent variable is a measure of age at admission, the models account for "late entry into the risk set" or "left truncation" (Allison, 1995). Briefly, the assumption that every individual in our sample is at risk of institutionalization from time 0 until the event occurs or the observation is censored is violated (Hirth, Banaszak-Holl, & McCarthy, 2000). Husbands and wives who were older than exact age 65 at the time of the baseline interview are "left truncated" because they were not *observationally* at risk of nursing home use at ages prior to the initial interview. Ignoring variations in the time of entry into the risk set would result in bias in the survivor functions and in the proportional hazard models' covariates.

Observations were censored if either death or the end of the study period occurred before nursing home admission was observed. Prior nursing home admission, education, and race/ethnicity are considered stable characteristics and were measured at baseline (1998). Death of a spouse was time dependent, designated as 0 until a spouse died (if at all), and as 1 thereafter. For all other variables, time-varying covariates were reconstituted for each month of observation. Monthly values were drawn from the most proximal biennial HRS interview. Thus, we were able to capture changes in family structure resulting from the death of adult children that may have occurred during the study period.

The HRS is based on a complex sampling design, with overrepresentation of Hispanics, African Americans and Floridians. Consequently, all descriptive statistics and multivariate analyses account for clustering and stratification in the sample design as well as for differential probability of selection. Adjusted point estimates and standard errors were calculated using Stata 10 (StataCorp, 2007).

## Results

*Descriptive Analysis*

In our sample of elderly married respondents, the median survival time without nursing home institutionalization was 88 years for husbands and 87 years for wives. In Figure 1, we examine the risk of nursing home admission for husbands and wives in our sample. The figure displays product-limit estimator probabilities of surviving to a given age without having been admitted to a nursing home. The curves are stratified according to spouses' vital status during the observation period. The survival curves suggest that marital partners who lost their spouse between 1998 and 2006 had lower probabilities of surviving to a given age without nursing home institutionalization. For instance, 83% of husbands who did not lose their spouse survived to age 80 without a nursing home admission versus 64% among those who became widowed. In addition, because the vertical distance between the two curves is generally greater in the husbands' graph, Figure 1 suggests that the effect of spousal loss on nursing home admission is more pronounced for husbands than for wives.

Table 2 examines the probabilities of nursing home admission at various ages among husbands and wives who
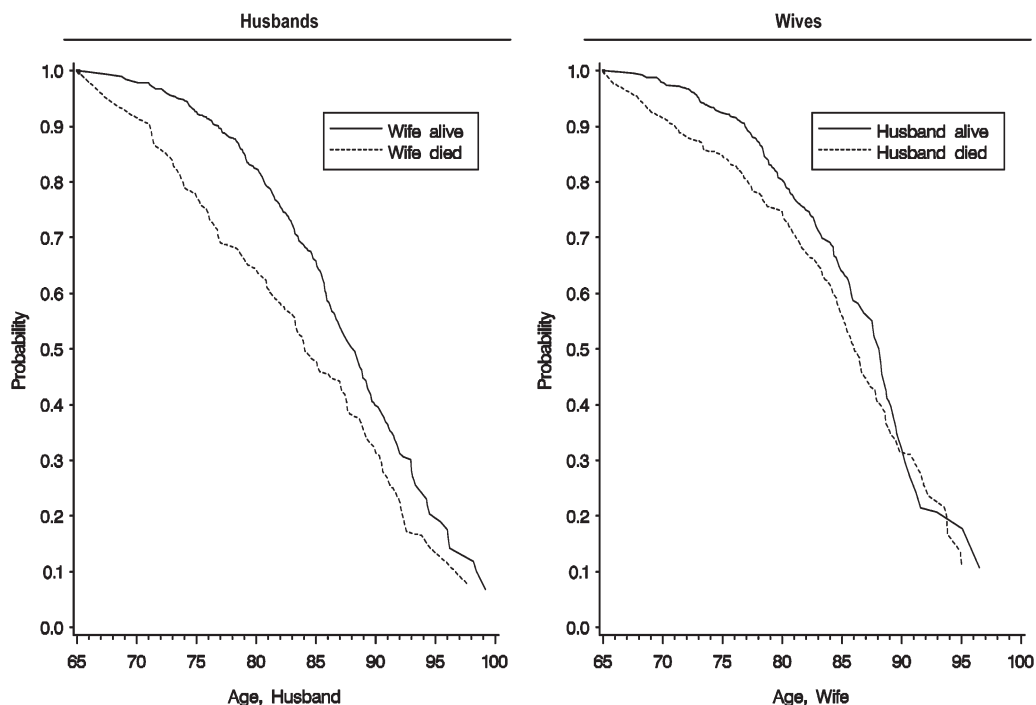
Figure 1. Husbands' and wives' probability of surviving to a given age without nursing home admission: Health and Retirement Study, 1998–2006.

became widowed during the study period and whose spouse survived to the end of the observation period. The estimates differentiate between husbands' and wives' number of children as reported in 1998. Among widow(er)s, results are suggestive of a strong negative relationship between increased child availability and the probability of nursing home admission at older ages. For example, 82% of wives who lost their spouse during the study period and had at most one child had entered a nursing home by age 90. In comparison, only 65% of widows with three or more children were admitted into a nursing home by that age. Table 2 suggests that children's reducing effect on widowed elderly persons' risk of institutionalization is more pronounced for widowers than it is for widows. Consistent with spouses' preeminence as caregivers to their partner, the lower panel of Table 2 suggests that the reductions in the likelihood of

institutionalization associated with greater availability of adult children are notably smaller among husbands and wives whose spouse remained alive throughout the study period.

*Effect of Spousal Loss on the Risk of Nursing Home Use*

Table 3 shows coefficients, significance levels, and hazard ratios from proportional hazards models predicting the risk of first observed nursing home admission among husbands and wives.

Model 1a indicates that, even after controlling for socioeconomic, health, and disability characteristics, spousal loss significantly increases the hazard of institutionalization among husbands. We observe that the hazard of nursing home admission for widowers is twice that of men who did not lose their wife (hazard ratio: 1.99, $p \leq .01$). In

Table 2. Probability of Nursing Home Admission at Ages 70, 80 and 90 Among Husbands and Wives, by Spousal vital Status and Number of Children, Health and Retirement Study 1998–2006[a]

| | Husbands | | | | Wives | | | |
|---|---|---|---|---|---|---|---|---|
| | 70 years | 80 years | 90 years | *N* | 70 years | 80 years | 90 years | *N* |
| Spouse died, 1998–2006 | | | | | | | | |
| 0–1 child | 0.32 | 0.64 | 0.85 | 103 | 0.18 | 0.32 | 0.82 | 170 |
| 2 children | 0.10 | 0.31 | 0.64 | 84 | 0.11 | 0.31 | 0.66 | 190 |
| 3+ children | 0.04 | 0.23 | 0.68 | 175 | 0.06 | 0.21 | 0.65 | 341 |
| Spouse alive, 1998–2006 | | | | | | | | |
| 0–1 child | 0.07 | 0.21 | 0.54 | 344 | 0.07 | 0.25 | 0.74 | 264 |
| 2 children | 0.01 | 0.17 | 0.71 | 479 | 0.03 | 0.18 | 0.65 | 394 |
| 3+ children | 0.02 | 0.18 | 0.58 | 931 | 0.02 | 0.20 | 0.72 | 757 |

*Notes*: [a] Number of children is measured in 1998.

Table 3. Proportional Hazard Models for First Observed Nursing Home Admission, Health and Retirement Study 1998–2006[a]

| | Husbands | | | | Wives | | | |
|---|---|---|---|---|---|---|---|---|
| | Model 1a | | Model 2a | | Model 1b | | Model 2b | |
| | Coefficient | Hazard ratio | Coefficient | Hazard ratio | Coefficient | Hazard ratio | Coefficient | Hazard ratio |
| Own characteristics | | | | | | | | |
| Race/ethnicity | | | | | | | | |
| Non-Hispanic White | — | — | — | — | — | — | — | — |
| Hispanic White | −1.105* | 0.33 | −1.105* | 0.33 | −0.972* | 0.38 | −0.982* | 0.37 |
| Black | −0.501† | 0.61 | −0.518* | 0.60 | −0.600† | 0.55 | −0.613* | 0.54 |
| Other | −0.563 | 0.57 | −0.574 | 0.56 | −0.951† | 0.39 | −0.896† | 0.41 |
| Education | | | | | | | | |
| Less than high school | — | — | — | — | — | — | — | — |
| High school | 0.124 | 1.13 | 0.108 | 1.11 | 0.035 | 1.04 | 0.024 | 1.02 |
| Some college | 0.244 | 1.28 | .226 | 1.25 | −0.123 | 0.88 | −0.129 | 0.88 |
| College graduate | 0.011 | 1.01 | 0.002 | 1.00 | −0.111 | 0.89 | −0.128 | 0.88 |
| Poor self-reported health | 0.323** | 1.38 | 0.331** | 1.39 | 0.132 | 1.14 | 0.136 | 1.15 |
| Disability | | | | | | | | |
| 0 ADL | — | — | — | — | — | — | — | — |
| 1–2 ADL | 0.832** | 2.30 | 0.827** | 2.29 | 0.909** | 2.48 | 0.912** | 2.49 |
| 3+ ADL | 1.352** | 3.87 | 1.363** | 3.91 | 1.284** | 3.61 | 1.276** | 3.58 |
| 0 IADL | — | — | — | — | — | — | — | — |
| 1–2 IADL | 0.819** | 2.27 | 0.806** | 2.24 | 0.754** | 2.13 | 0.762** | 2.14 |
| 3+ IADL | 1.208** | 3.35 | 1.202** | 3.33 | 1.286** | 3.62 | 1.304** | 3.68 |
| Cognitive function | | | | | | | | |
| High | — | — | — | — | — | — | — | — |
| Moderate | 0.076 | 1.08 | 0.061 | 1.06 | 0.130 | 1.14 | 0.125 | 1.13 |
| Low | 0.451* | 1.57 | 0.439* | 1.55 | 0.514** | 1.67 | 0.506** | 1.66 |
| Health Insurance coverage | | | | | | | | |
| Medicaid | 0.104 | 1.11 | 0.076 | 1.08 | −0.109 | 0.90 | −0.117 | 0.89 |
| Long-term care insurance | 0.252 | 1.29 | 0.251 | 1.29 | 0.069 | 1.07 | 0.065 | 1.07 |
| Couple's net worth | | | | | | | | |
| Low | — | — | — | — | — | — | — | — |
| Middle | 0.247† | 1.28 | 0.245† | 1.28 | −0.212 | 0.81 | −0.207 | 0.81 |
| High | 0.112 | 1.12 | 0.106 | 1.11 | −0.078 | 0.92 | −0.065 | 0.94 |
| Prior nursing home use | 0.336 | 1.40 | 0.359 | 1.43 | 0.357 | 1.43 | 0.363 | 1.44 |
| Spousal characteristics | | | | | | | | |
| Age | 0.083** | 1.09 | 0.082** | 1.09 | 0.015 | 1.01 | 0.014 | 1.01 |
| Poor self-reported health | −0.138 | 0.87 | −0.144 | 0.87 | 0.008 | 1.01 | 0.007 | 1.01 |
| Disability | | | | | | | | |
| 0 ADL | — | — | — | — | — | — | — | — |
| 1–2 ADL | 0.072 | 1.07 | 0.073 | 1.08 | −0.410† | 0.66 | −0.412* | 0.66 |
| 3+ ADL | −0.080 | 0.92 | −0.079 | 0.92 | −0.090 | 0.91 | −0.104 | 0.90 |
| 0 IADL | – | — | — | — | — | — | — | — |
| 1–2 IADL | −0.037 | 0.96 | −0.025 | 0.98 | 0.129 | 1.14 | 0.136 | 1.15 |
| 3+ IADL | 0.299 | 1.35 | 0.311 | 1.36 | 0.011 | 1.01 | 0.013 | 1.01 |
| Cognitive function | | | | | | | | |
| High | — | — | — | — | — | — | — | — |
| Moderate | 0.283† | 1.33 | 0.287† | 1.33 | 0.161 | 1.17 | 0.164 | 1.18 |
| Low | 0.314 | 1.37 | 0.318 | 1.37 | 0.358 | 1.43 | 0.362 | 1.44 |
| Family composition | | | | | | | | |
| Number of children | −0.018 | 0.98 | 0.005 | 1.00 | −0.057* | 0.94 | −0.028 | 0.97 |
| Spousal death | 0.689** | 1.99 | 1.201** | 3.32 | 0.421† | 1.52 | 0.693* | 2.00 |
| Interaction | | | | | | | | |
| Number of children × spousal death | | | −0.208* | 0.81 | | | −0.107 | 0.90 |
| F-statistic | 28.35** | | 27.70** | | 20.47** | | 18.85** | |

*Notes*: [a]The proportional hazards models were corrected for left truncation. Race/ethnicity, education and prior nursing home use are fixed characteristics measured in 1998. All other variables are time-varying. ADL = activities of daily living; IADL = instrumental activities of daily living.

†$p \leq .10$; *$p \leq .05$; **$p \leq .01$. (two-tailed).

contrast, among wives (Model 1b), the risk of nursing home admission is identical for those whose husband died and those whose husband remained alive at the end of the study period (hazard ratio: 1.52, $p \leq .10$). These findings are consistent with prior documentation of gender varia-tions in the provision of informal care within the marital context. Although men experience a strong excess risk of institutionalization following spousal loss, their female counterparts' risk of nursing home admission is not af-fected by spousal death.

Table 4. Effects of Sons and Daughters on the Risk of First observed Nursing Home Admission, Health and Retirement Study 1998–2006[a]

| | Husbands | | | | Wives | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Model 1a | | Model 2a | | Model 1b | | Model 2b | |
| | Coefficient | Hazard Ratio | Coefficient | Hazard Ratio | Coefficient | Hazard Ratio | Coefficient | Hazard Ratio |
| Spousal death | 0.686** | 1.99 | 1.188** | 3.28 | 0.421[†] | 1.52 | 0.719* | 2.05 |
| Number of sons | −0.033 | 0.97 | −0.001 | 1.00 | −0.060 | 0.94 | −0.061 | 0.94 |
| Number of daughters | −0.004 | 1.00 | 0.011 | 1.01 | −0.054 | 0.95 | 0.002 | 1.00 |
| Interactions | | | | | | | | |
| Number of sons × spousal death | | | −0.263[†] | 0.77 | | | 0.014 | 1.01 |
| Number of daughters × spousal death | | | −0.149 | 0.86 | | | −0.246[†] | 0.78 |
| *F*-statistic | 26.86** | | 25.00** | | 19.21** | | 19.83** | |

*Notes*: [a]Estimates from proportional hazards models, corrected for left truncation. All control variables were included in the models (Table 3).

[†]$p \leq .10$; *$p \leq .05$; **$p \leq .01$ (two-tailed).

In both husbands' and wives' models, the control variables show expected effects. Having ADL and IADL disabilities as well as low cognitive function strongly increases the risk of nursing home use. In addition, Hispanic Whites have a lower risk of nursing home use compared with non-Hispanic Whites. Although the results regarding Blacks are in the expected direction, they do not reach statistical significance. In accordance with previous studies of nursing home institutionalization, education, health insurance coverage, and couple's net worth did not have significant effects. Among spousal characteristics, age was highly significant in the husbands' model, indicating that older wives have a reduced ability to contain their husband's risk of nursing home admission. We do not find any effects of spouse's self-reported health, disability status, and cognitive function on their partner's risk of nursing home admission.

### *Do Adult Children Reduce Husbands' and Wives' Risk of Nursing Home Admission?*

In Models 1a and 1b (Table 3), the coefficient for the number of children represents the effect of one additional child on a marital partner's hazard of nursing home use, regardless of whether a spouse became widowed during the study period. In our sample of married partners, each additional child diminishes wives' risk of nursing home use by 6% (hazard ratio: 0.94, $p \leq .05$). Although the main effect of number of children in the husbands' model is in the expected direction, the coefficient is not significant.

By introducing an interaction term between spousal loss and our measure of child availability into the models (Table 3; Models 2a and 2b), we explore adult children's role in reducing widowed parents' risk of nursing home institutionalization following spousal loss. Our results support the hypothesis that adult children counter the increased risk of nursing home admission faced by husbands following spousal loss (hazard ratio: .81, $p \leq .05$). However, there is no additional affect of an increase in child availability among wives after they have experienced the death of their husband.

In sum, we find evidence that adult children reduce wives' risk of institutionalization regardless of spousal death. In contrast, adult children buffer husbands' risk of nursing home entry only after the death of their wife, when spousal assistance is no longer available.

### *Parent–Child Gender Concordance in Children's Effect on Widowed Parents' Risk of Institutionalization*

Table 4 examines variations by gender in adult children's effect on the risk of nursing home use following spousal loss. We present results from proportional hazards models, which distinguish between husbands' and wives' number of sons and daughters. Although all control variables were included in the models, for the sake of brevity and because they were similar to those presented in Table 3, their coefficients are omitted.

The main effects of number of sons and number of daughters are not statistically significant in both the husbands' and the wives' models (Models 1a and 1b). Although the main effect of number of children was significant for wives, gender-specific increases in the number of sons and daughters are not related to wives' risk of institutionalization. Because their *p* values do not quite reach the .05 cutoff, the interaction variables introduced in Models 2a and 2b are only suggestive of gender consistency in adult children's tendency to reduce the risk of nursing home use faced by widow(er)s. Results suggest that having one additional son reduces the effects of spousal loss among widowers (hazard ratio: 0.77, $p = .07$), but not among widows. Conversely, Table 4 suggests that a greater number of daughters diminishes wives' risk of institutionalization following spousal loss (hazard ratio: 0.78, $p = .06$), but not husbands'.

### DISCUSSION

This study contributes to our understanding of the relationship between kin availability and the use of nursing home care among married elderly Americans. Based on the premise that spouses and children allow frail elderly persons to maintain community residency through the

provision of informal care, the preceding analyses examined the following four hypotheses: (a) the excess risk of nursing home institutionalization following spousal loss is greater among husbands than among wives, (b) adult children reduce wives' risk of nursing home admission regardless of husbands' vital status, (c) adult children buffer widowers' excess risk of nursing home admission, (d) adult children's limiting effect on their elderly parents' risk of nursing home admission is contingent on parent–child gender concordance. Informed by a life course perspective, we examined the effect of family structure on the risk of nursing home admission in the context of elderly person's marital trajectories. Furthermore, the concept of linked lives guided our examination of the effect of adult children on husbands' and wives risk of nursing home entry and the ways in which this effect might differ at various stages of parents' marital trajectory. We break with researchers' prior conventional approach, consisting in contrasting the risk of nursing home admission among married and unmarried elderly. Taking advantage of longitudinal data on elderly couples, we investigate the effect of spousal loss on the risk of nursing home institutionalization among husbands and wives, independent of the effect of being never married or divorced. In addition, acknowledging variations in husbands' and wives' reliance on care from adult children before and after the death of a spouse, our study contributes new evidence on children's buffering effect on their married parents' risk of institutionalization.

Generally, our research supports prior work documenting relatives' protective role against the risk of nursing home admission, but offers evidence of important variations by gender in the protection offered by kin to marital partners. Consistent with a documented heightened risk of nursing home institutionalization among unmarried elderly persons, this study reports that husbands' risk of nursing home admission doubled following spousal loss. The effect of wives' death is roughly comparable with that of low levels of ADL or IADL disability and is generally greater than prior published estimates of unmarried elderly persons' increased risk of institutionalization. This points to the importance of distinguishing within the category of unmarried elderly persons when investigating older men's risk of nursing home admission. In contrast, we show that the risk of nursing home entry among women was unchanged after spousal death. The gender difference in the effect of spousal loss is in agreement with wives' greater provision of informal care to their spouse. In addition to reflecting lower levels of caregiving by husbands, the nonsignificant effect of spousal loss among wives may also be an indication of widows' greater ability to execute tasks necessary to their continued community residency that were previously performed by their husbands.

Our analyses show that adult children reduce their mothers' and fathers' risk of nursing home admission at different points in their respective marital trajectories. Although adult children prevent women's nursing home entry irrespective of their husband's presence, increased child availability buffers the excess risk of nursing home use faced by men after their wife's death. These results are consistent with previously documented gender differences in married elderly person's patterns of care receipt from a spouse and from adult children. They are in agreement with prior evidence that, husbands rely primarily on their wives for informal care and that adult children's role as providers of care to their married father is by far secondary to that of his wife. Conversely, even in the presence of a husband, wives rely heavily on informal support provided by adult children (Katz et al., 2000; Stoller et al., 1992).

Furthermore, we offer suggestive evidence of parent–child gender concordance in adult children's ability to contain elderly widowed parents' risk of institutionalization. Although our conclusions are not definitive, our findings point to a likely role of sons in reducing widowers' risk of nursing home use. Although daughters are more likely to provide personal care to parents than sons (Wolf, Freedman, & Soldo, 1997), recent work questions the premise that adult daughters preeminently contain elderly persons' risk of nursing home entry. Charles and Sevak (2001) report that having relatively more daughters than sons has no effect on the risk of nursing home entry. In a cross-sectional study of the risk of residing in a nursing home, McNally and Wolf (1996) find that although both sons and daughters contribute to maintaining their elderly mother within the community, only sons reduce their father's chances of residing in a nursing home facility.

There are several limitations to our study. Due to shortcomings of the HRS, this analysis focused on the first *observed* nursing home admission. From a respondent's perspective, we modeled a first or a higher order nursing home entry. The preceding analyses thus implicitly assume that the effect of kin availability on the risk of nursing home admission is invariant to the rank of the nursing home admission. It has been suggested that first nursing home admissions are qualitatively different because they mark the beginning of a period of formal long-term use (Freedman, 1996). Although the evidence in support of this hypothesis is scant (Valiyeva, Russell, Miller, & Safford, 2006), it remains possible that family structure operates differently among elderly facing higher order nursing home entries, as kin adjust their efforts to delay institutionalization based on their experience of prior nursing home admissions. However, because the vast majority of nursing home stays are first nursing home stays, we believe that the resulting bias in our estimates is small. Further research is needed to recognize the repeatable nature of nursing home admissions and to examine variations in the effect of kin availability in reducing married elderly person's risk of first and subsequent nursing home entry.

Because of the relatively small size of our sample, this analysis considered nursing home entry regardless of the length of stay. Prior research has identified differences in the health and disability determinants of short-term stays, generally for acute or rehabilitative care, and long-term stays, typically for care related to chronic disabilities (Liu, McBride, & Coughlin, 1994).

Furthermore, although frail older persons and their families have a variety of alternatives to nursing home care, including assisted living facilities and home health care, due to restrictions of the data, we do not model such alternatives as competing risk to that of nursing home institutionalization.

Our final analytical sample constituted 90% of couples at risk of nursing home entry in 1998. A number of couples were excluded from the analysis because a marital partner's nursing home history could not be reconstituted or because of missing data on either the husband's or the wife's characteristics. Additional analyses (results not shown) revealed that excluded marital partners were in worse physical and cognitive health and had worse levels of disability than those retained in the analytical sample. Although both groups had comparable values on the other variables included in this analysis, the incidence of nursing home entry may be underestimated. Furthermore, if spouses are more protective against nursing home admission among severely disabled than among less-disabled partners, we may also have underestimated the effect of spousal loss on the risk of nursing home entry.

The findings reported here have implications for future research. Our focus on gender variations in adult children's buffering effect on husbands' and wives' risk of institutionalization lead us to ignore other characteristics of adult children (e.g., number of children, martial status, geographic proximity, and labor force participation) that may influence the risk of nursing home entry. Furthermore, because of data limitations, we were unable to explore variations in the effect of spousal loss with the duration of widowhood. As older men adapt to living in the community without a spouse, the effect of widowhood may decrease with time since spousal loss. Finally, future research should contrast the effects of spousal death to that of separation and should examine variations in adult children's role after a parent's death and a parent's divorce. Such a research agenda will require large longitudinal data sets on couples' marital and nursing home histories as well as on their adult children.

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