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Mental and Physical Health Consequences of Spousal Health Shocks Among Older Adults

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Abstract

Objective: To examine how the experience of a negative health event (i.e., onset of heart disease, diabetes, lung disease, cancer, or stroke) of one spouse affects the mental and physical well-being of the other partner as measured by depressive symptoms and self-reported health. **Methods:** We employ latent growth curve analysis and examine adults 50+ using six waves of data (1998-2008) from the Health and Retirement Study. **Results:** One spouse's health shock affects the health of the other partner. Results indicate that a spouse's onset of a severe health condition worsens the mental health of women and the self-reported health of men. **Discussion:** These findings illustrate that the family context of spouses is important to consider when examining health.

Keywords

health shocks, depression, self-reported health, gender differences

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Introduction

Much remains to be learned about the mechanisms that link spousal health in older adulthood. Although the research in this area is plentiful, studies have primarily focused on the concordance of health and health behaviors, the effects of widowhood, and caregiving (Walker & Luszcz, 2009), while generally ignoring the possible effects of a decline in one partner's health on the well-being of the other, separate from mortality. The bulk of this literature focuses on how the health of individuals within couples is correlated, and some previous literature also suggests that individuals can impact the mental and physical health of their partner (Manzoli, Villari, Pirone, & Boccia, 2007; Meyler, Stimpson, & Peek, 2007). In addition, intimate partners can be of positive and negative influence, such as motivating changes in or encouraging the relapse of negative health behaviors (Falba & Sindelar, 2008; Homish & Leonard, 2005). Furthermore, caring for an ill spouse may have implications for an individual's well-being (Vitaliano, Zhang, & Scanlan, 2003). While these studies begin to shed light on the mechanisms of health in a dyadic context, researchers have yet to explore the onset of a severe condition or "health shock" of one spouse and its short and longer term effects on the mental and physical well-being of the other partner, separate from the effects of widowhood. This is important since previous research has primarily focused on the postbereavement effects, without exploring the potential health declines individuals may experience after the onset of a spousal chronic condition (Lee, DeMaris, Bavin, & Sullivan, 2001). Without accounting for widowhood, we cannot parse out the effects of spousal loss versus the onset of a health shock.

Much of the literature on health shocks examines the impact of health and health changes on wealth and retirement decisions. For example, using the Health and Retirement Study (HRS), Lee and Kim (2008) found that the onset of a new health condition lowers wealth among those aged 70 and older, but that the effect disappears over time. In another study using HRS, findings indicate an association between a spousal health shock (SHS) and retirement decisions. Wives are more likely to retire when their husband experiences the onset of a new health condition, but health shocks among wives do not influence retirement decisions among men (McGeary, 2009). The gender difference may reflect that older women tend to contribute fewer financial resources to the household coupled with norms surrounding gendered caregiving (Dentinger & Clarkberg, 2002). This research suggests that health shocks have meaningful consequences for spouses, and that these effects differ by gender. Although these studies make important contributions to the literature on dyadic health, it is important to examine whether the effects of SHSs extend beyond wealth and retirement.

Research indicates that marriage is generally beneficial for health and well-being (Lillard & Waite, 1995; Liu & Umberson, 2008), although important questions remain over specific causal mechanisms as well as issues of selectivity and shared environments. In this context, it is particularly informative to consider what happens among older couples when one spouse experiences a negative health shock. Tracing downstream changes in the other partner's physical and mental health following a spouse's serious health event may give insight into the ways in which spouses contribute to each other's health status. Using six waves of the HRS, we examine how the experience of a negative health event (i.e., onset of heart disease, diabetes, lung disease, cancer, or stroke) of one spouse affects the mental and physical well-being—measured as depressive symptoms and self-reported health—of the other spouse, net of spousal mortality. Furthermore, we explore gender differences in each of the outcomes. To the best of our knowledge, we are the first to disentangle the mental and self-reported health effects of a SHS independent of the effects of widowhood. Examining these effects is particularly informative for policymakers to establish programs to target individuals that may experience health deficits as a result of having a spousal with a chronic condition. Extant literature on health concordance, widowhood, and caregiving helps to disentangle the possible mechanisms underlying spousal associations.

Literature Review

Health problems are common among older Americans. According to self-reports from the National Health Interview Survey, 24.5% of adults aged 65 and over in the United States reported poor or fair health. Furthermore, among these same individuals, 30.9% report ever being told by a physician that they have heart disease, 20.5% report ever having diabetes, 24.4% report ever having cancer, 8.6% report having ever had a stroke, and 10.1% report ever having lung disease (National Center for Health Statistics, 2013).

Depression and self-reported health are important indicators of the long-term well-being of older adults. Both depressive symptoms and self-reported health have been shown to be strong and independent predictors of mortality risk, net of sociodemographic characteristics and other health factors (Benjamins, Hummer, Eberstein, & Nam, 2004; Rogers, Hummer, & Nam, 2000). Self-reported health has been found to correspond to morbidity as assessed through physical examination (Ferraro & Farmer, 1999) and additionally to exhibit strong relationships net of controls with cause-specific mortality from cancer, circulatory disease, respiratory disease and "other causes," but not "social pathologies" like suicide (Rogers et al., 2000). When examining trajectories of health among older adults, research indicates that

the odds of reporting poor self-rated health at baseline increase over time (Sargent-Cox, Anstey, & Luszcz, 2010). Furthermore, the age trajectory of depressive symptoms during late life is positive and linear, although this effect is largely cohort-driven (Yang, 2007).

Health Concordance

A substantial body of research has examined the concordance of health and health behaviors among couples, highlighting that the well-being of individuals is often shaped by others' influences, such as through social support, social engagement, shared environment, social control, and access to resources (Berkman & Glass, 2000; Meyler et al., 2007; Smith & Christakis, 2008). Within the context of an intimate relationship, studies find evidence that partners' well-being is correlated (Ayotte, Yang, & Jones, 2010; Peek, Stimpson, Townsend, & Markides, 2006; Townsend, Miller, & Guo, 2001). Studies have found significant spousal concordance in behaviors such as smoking, alcohol intake, weight gain, and even cardiovascular risk (Castelnuovo, Quacquaruccio, Donati, de Gaetano, & Iacoviello, 2008; Christakis & Fowler, 2008; Graham & Braun, 1999; Sobal, Rauschenbach, & Frongillo, 2003). Although there is a self-selection effect in that people are likely to marry someone with similar behaviors to themselves, research also shows that spousal behaviors change over time in concordance with their partner (Sobal et al., 2003), reflecting the influence of spouses and/or a shared environment and the importance of studying health in the context of marital dyads.

Similarities in mental health have also been found within couples. Although marriage per se is protective against depression (Ross, Mirowsky, & Goldsteen, 1990), research has found that living with a spouse with depressive symptoms increases the partner's risk of developing depressive symptoms (Townsend et al., 2001). Furthermore, net of controls, studies have found that changes in depressive symptoms are associated among partners (Siegel, Bradley, Gallo, & Kasl, 2004).

As with the literature on mental health, research also indicates spousal concordance of physical health (Meyler et al., 2007). With spouses sharing an environment and lifestyle, it is likely that they will experience linked rates of chronic conditions. Stimpson and Peek (2005) found evidence of this phenomenon when examining Mexican Americans in the United States. Findings indicated that the husband's risks of being diagnosed with hypertension, diabetes, arthritis, and cancers were significantly increased when the wife was diagnosed with the same conditions. Furthermore, the wife's risks for being diagnosed with hypertension, arthritis, and cancer were significantly increased when the husband was diagnosed with the corresponding condition.

Although concordance of self-reported health has been far less examined, it has been found that subjective well-being of one spouse predicts the well-being of their partner (Bookwala & Schulz, 1996; Wilson, 2001). Although used here as an indicator of physical health based on findings of strong relationships between this variable and cause-of-death specific mortality (Rogers et al., 2000), self-reported health also reflects in part the mental health of older adults (Schnittker, 2005). While this concordance literature helps to illustrate the influence spouses have on each other, it tends to focus on similarities rather than how a change in health, namely the onset of poorer health, affects one's partner.

Recent studies also suggest that mental and physical health among couples are interrelated, such that levels and changes in functional limitations of one spouse are positively associated with depressive symptom levels in the other spouse (Hoppmann, Gerstorf, & Hibbert, 2011). One study found that wives were more likely to report higher levels of depressive symptoms if their husband was diagnosed with a chronic condition (Ayotte et al., 2010). These studies suggest the need for longitudinal analyses to examine the influence of SHSs on the mental and physical health trajectories of their partners.

Widowhood Effect

The transition to widowhood is a major life event that has implications for the well-being of family members, especially spouses (Carr, 2009; Lee & Carr, 2007). The death of a spouse has been found to be associated with numerous health-related outcomes, including mortality (Elwert & Christakis, 2008; Manzoli et al., 2007), depressive symptoms (Lee et al., 2001), functional limitations, chronic conditions, and poorer self-reported health (Hughes & Waite, 2009). Furthermore, Utz and colleagues (2011) indicate that there is a dynamic relationship between physical and mental health among recently widowed individuals, such that those who report poorer self-rated health initially experience higher levels of grief and depressive symptoms. Over time, however, the mental health trajectories of all widowed individuals become similar, regardless of physical health status.

While the link between widowhood and health is well-established in the literature, few studies have examined the health of older adults approaching spousal loss (Williams, Sawyer, Roseman, & Allman, 2008). Williams and colleagues (2008) found that pre-widowed individuals reported similar levels of self-reported health and depression to those who are widowed. Thus, the failing health of one spouse may be associated with poorer health of the other, apart from the effects of their death.

Caregiving

Individuals experience a variety of transitions throughout the life course. One later-life transition that is particularly important is the transition to the caregiver role, whether it is for a spouse, parent, or both. Informal care is a burden that many family members will experience in their lifetime, with spousal caregiving being one of the most common forms of informal long-term care (Lima, Allen, Goldscheider, & Intrator, 2008). Although we are unable to empirically examine spousal caregiving, studies suggest that as a result of providing assistance due to physical, cognitive, or emotional impairments, caregivers often compromise and sacrifice their own well-being, leading to adverse health outcomes. Across a variety of outcomes, caregivers seem to exhibit a greater risk of health problems compared to noncaregivers (Vitaliano et al., 2003). Studies indicate that caring for an ill family member is associated with higher levels of depressive symptoms (Hahn, Kim, & Chiriboga, 2011; Turner, Killian, & Cain, 2004), poorer self-rated health, and a higher number of health risk behaviors (Burton, Zdaniuk, Schulz, Jackson, & Hirsch, 2003). However, some studies suggest that older caregivers, compared to noncaregivers, actually experience better health outcomes (Bertrand et al., 2012; O'Reilly, Connolly, Rosato, & Patterson, 2008), perhaps due to caregivers being more physically active than noncaregivers (Fredman, Bertrand, Martire, Hochberg, & Harris, 2006; Fredman et al., 2008) as well continuously engaging in cognitive tasks (Colcombe & Kramer, 2003; Lachman, Neupert, Bertrand, & Jette, 2006). Other research has also found that the relationship between caregiving and declines in health is mediated, or at least partially accounted for, when controlling for sociodemographic characteristics and health factors, including age, education, income, and functional limitations (Jenkins, Kabeto, & Langa, 2009; Schulz, Newsom, Mittelmark, Burton, & Hirsch, 1997).

Gender Differences

While the illness and death of a partner have been shown to influence the health of both men and women (Zivin & Christakis, 2007), many studies find evidence that women's well-being is more likely to be impacted by their husband's health (Ayotte et al., 2010; Hagedoorn et al., 2001), and that women experience more caregiving stressors (Pinquart & Sörensen, 2006). For example, one study found that wives experienced a higher risk of depressive symptoms when their husbands were diagnosed with chronic conditions, high blood pressure or a stroke. However, there was no significant effect on husbands' depressive symptoms following their wives onset of chronic conditions (Ayotte et al., 2010). In contrast, a recent study found that men's psychological well-being was predicted by their

wives' functional and psychological well-being, while for women the biggest predictor was their own functional health, such that higher levels of functional ability predicted fewer depressive symptoms and less stress (Ruthig, Trisko, & Stewart, 2012). Due to equivocal findings, further research is needed to more fully disentangle the different effects of spousal health by gender.

In sum, these studies suggest the importance of considering spouses and gender differences when examining factors affecting individual health and well-being. Our purpose is to examine the extent to which changes in the health of one spouse affect the depressive symptoms and self-reported health of the other partner. This research is distinguished from previous studies because we (a) examine the effect of chronic condition health shocks, taking into account spousal mortality; (b) examine both immediate and long-term consequences of SHSs on the well-being of their partners; and (c) examine how the effects of health shocks on the well-being of spouses differ by gender. As a result, we are able to draw more precise conclusions about the connections of well-being among spouses.

Method

Data

This study utilizes data from the Health and Retirement Study (HRS), a nationally representative survey of adults aged 50 and older in the United States beginning in 1992. The initial HRS cohort consisted only of adults born from 1931 to 1941. In consecutive waves, other birth cohorts have been incorporated. We rely only on cohorts of individuals that were included at the time of the 1998 survey. We use the 1998 survey as the baseline in order to incorporate the majority of the cohorts with information at each time period. Therefore, our analyses use six waves of data, from 1998 to 2008, which includes the Assets and Health Dynamics among the Oldest Old (born before 1924), the Children of the Depression (born between 1924 and 1930), the original HRS cohort (born between 1931 and 1941), and the War Babies (born between 1942 and 1947). Because we limit our sample to the period of 1998 to 2008, our study excludes the Early Baby Boom Cohort (born between 1948 and 1953), which was added in 2004.

Measures

Our data come from the RAND HRS data file, version K. All measures we employ were constructed by the RAND HRS (http://hrsonline.isr.umich.edu/modules/meta/rand/index.html).

Depressive Symptoms. Our first outcome is respondent's level of depressive symptoms, measured with a RAND-constructed 8-item version of the Center for Epidemiologic Studies Depression Scale (CES-D), based on a series of yes/no questions. Respondents were asked to report whether "much of the time during the past week you . . . " (a) felt depressed, (b) felt everything you did was an effort, (c) felt your sleep was restless, (d) were happy (reverse coded), (e) felt lonely, (f) could not get going (g) felt sad, and (h) enjoyed life (reverse coded). Values on the scale range from 0 to 8 with higher values indicating more depressive symptoms.

Self-Reported Health. Our second outcome is a continuous measure of respondent's self-reported general health status. Respondents were asked, "In general, how would you rate your health?" Responses were based on a 5-point scale, which was reverse coded (1 = excellent to 5 = poor) to parallel the indicator of depressive symptoms.

Primary Covariate. A spousal "health shock," which we will refer to as "SHS," is defined as the onset of any severe condition between 1998 and 2000, such that the condition was reported not present in 1998, but was reported present in 2000. Consistent with previous research (Lee & Kim, 2008), conditions that are considered severe in this study include cancer, diabetes, heart disease, stroke, and lung disease, as these may cause declines in functioning and are leading causes of death (Kochanek, Xu, Murphy, Miniño, & Kung, 2012).

Controls. Sociodemographic and background variables for the respondent, including baseline depressive symptoms and self-reported health, are taken from the 1998 interview. Respondent's age is measured in years. Race/ethnicity was measured as White (reference category), Black, Hispanic, and Other. Education is measured in years. Currently working is a dichotomous measure of whether the respondent is currently working for pay (1 = Yes, 0 = No). Any health insurance is measured as a binary indicator of whether the respondent reports receiving any of the following types of health insurance coverage: federal government plan (Medicare, Medicaid, VA/CHAMPUS, or other), insurance from a current or previous employer (either respondent's own or spouse's employer), or other type of insurance. If respondents reported "Yes" to any of these indicators, they were given a 1, all others 0. Logged *household wealth* was measured in thousands using total value of assets. Respondent *number of conditions*, ranging from 0 to 8, is a sum of indicators for whether a doctor has ever told the respondent that he or she had a particular disease, including high blood pressure, diabetes, cancer, lung disease, heart disease, stroke, psychiatric problems, and arthritis. Employment status, health insurance coverage, and

respondent number of conditions were examined as time-varying covariates. The inclusion of these measures did not change the significance or substantive interpretation of our findings. Due to issues of collinearity and parsimony, the time-varying measures are not included in our final models.

We use two binary measures of divorce. The first is whether the respondent reported a *divorce from 1998 to 2000* in order to account for the effect of divorce on baseline depressive symptoms/self-reported health. In order to account for possible changes in the slope of depressive symptoms and self-reported health, we also use a measure of *divorce from 2000 to 2008*. We also include two dichotomous measures of *spousal death*: the first signifying if death occurred from 1998 to 2000 and the second from 2000 to 2008. This is necessary because those spouses who experience the onset of a condition from 1998 to 2000 are at greater risk of later mortality, which can be expected to have an effect on the respondents' mental and self-reported health separate from the effect of the health shock per se. The onset of any *spousal health condition between 2000 and 2008* (using the same conditions as the "SHS" variable) is also included in order to help to isolate the singular short-term and long-term effects of the onset of a spousal shock between 1998 and 2000 on respondent health, net of the spouse's future comorbidity or long-term health trajectory (i.e., whether the spouse recovers, stays the same, or gets worse). Last, we include two measures of *spousal disability* (from 1998 to 2000 and from 2000 to 2008) based on changes in the number of combined ADLs and IADLs. ADLs include difficulty with six activities: walking across a room, dressing, bathing, eating, getting in and out of bed, and using the toilet. IADLs include difficulty with five activities: using a phone, handling money, taking medication, shopping, and preparing meals. This measure is included to explore the effects of a newly diagnosed health condition controlling the trajectory of functionality.

Analytic Strategy

Analyses were conducted using latent growth curves to measure how a SHS between 1998 and 2000 affects the downstream health trajectories of the other partner, specifically his/her self-reported health and depressive symptoms. Latent growth curves may be estimated using a number of strategies, but a structural equation approach and Mplus software (see Muthén & Muthén, 2004) are chosen for flexibility. Based on a multivariate normality assumption, growth curves estimate individual intercepts and slopes of trajectories over time or age and may be used to measure how individuals vary from the average intercept and slope through the inclusion of covariates. Because we focus on health shocks only during specific years (1998-2000),

we may examine the impact on the partner's health both relatively soon after the shock (1-2 years) and also its long-term effects (up to 10 years) independent of other health events or death of the spouse.

The general level 1 equation may be expressed as:

$$y_{it} = \alpha_{yi} + \beta_{yi}\lambda_{yt} + \varepsilon_{yit} \quad (1)$$

where y_{it} is a vector of repeated measures, α_{yi} is a vector of latent intercepts, β_{yi} is a vector of latent slopes, λ_{yt} is a vector of fixed or freed loadings representing time, and ε_{yit} is a vector of disturbance terms assumed to have equal variances. It is assumed that ε_{yit} has a mean of zero, is homoscedastic for respondents at each time point, and is uncorrelated with $\alpha_{yi}, \beta_{yi}, \lambda_{yt}$, and ε_{yit}.

For both outcomes a linear model fits best compared to a quadratic and freed loading model. Due to the nature of our dependent variables, we also ran a count model for depressive symptoms and a series of binary models for self-reported health which yielded similar results. Thus for comparison and ease of interpretation, the continuous models were chosen. For depressive symptoms the unconditional model (without covariates) had good fit ($\chi^2(df)$ = 118.53(20), Confirmatory Fit Index = .990, Tucker Lewis Index = .990, Root Mean Square Error of Approximation = .036), whereas the unconditional model for self-reported health had an excellent fit (χ^2(df) = 134.49(20), Confirmatory Fit Index = .994, Tucker Lewis Index = .994, Root Mean Square Error of Approximation = .038).

Missing Data

Missing data were handled with a full information maximum likelihood estimator that calculates the likelihood for each individual given their available information. This allows individuals missing on the independent or dependent variables to remain in the analytic sample and allows individuals to contribute to the trajectory portions (depressive symptoms and self-reported health) of the model until they drop out. We include respondents whose spouses had completed the survey in 1998 (N = 13,978), respondents who were married (N = 13,497), those who were in the cohorts AHEAD, CODA, original HRS, and War Babies (N = 12,729), and those with one spouse throughout the study period (N = 12,465). This allows for divorce and spousal death, but not respondent remarriage. Excluding those without valid depressive symptoms/self-reported health in 1998 and 2000 (N = 9,837) and using listwise deletion for our baseline characteristics yields a sample size of 3,688 women and 4,044 men.

Table 1. Respondent Baseline Characteristics, by Gender, Health and Retirement Study 1998-2008.

		Women (n = 3,688)				Men (n = 4,044)		
Covariates	%	*M*	*SD*	*N*	%	*M*	*SD*	*N*
Age	—	63.37	8.16	3,688	—	65.84	8.81	4,044
White	83.65	—	—	3,688	84.45	—	—	4,044
Black	8.84	—	—	3,688	7.74	—	—	4,044
Hispanic	6.18	—	—	3,688	6.06	—	—	4,044
Other	1.33	—	—	3,688	1.76	—	—	4,044
Education (in years)	—	12.52	2.77	3,688	—	12.76	3.21	4,044
Any health insurance	94.77	—	—	3,688	96.44	—	—	4,044
Wealth (ln)	—	2.89	1.39	3,688	—	2.92	1.38	4,044
Currently working	40.02	—	—	3,688	50.74	—	—	4,044
Respondent # of conditions	—	1.38	1.20	3,688	—	1.46	1.23	4,044
Spouse health shock 1998-2000	12.12	—	—	3,688	7.84	—	—	4,044
Spouse death 1998-2000	5.21	—	—	3,688	2.23	—	—	4,044
Spouse disability 1998-2000	—	0.07	0.83	3,688	—	0.08	0.96	4,044
Divorce 1998-2000	0.14	—	—	3,688	0.12	—	—	4,044
Spouse health conditions 2000-2008	35.01	—	—	3,688	25.54	—	—	4,044
Spouse death 2000-2008	21.37	—	—	3,688	10.63	—	—	4,044
Spouse disability 2000-2008	—	0.42	1.70	3,688	—	0.33	1.60	4,044
Divorce 2000-2008	1.71	—	—	3,688	1.29	—	—	4,044

Health conditions includes cancer, diabetes, heart condition, stroke, or lung disease.

Results

Table 1 presents descriptive statistics for SHS and all control variables by gender. The sample is predominantly non-Hispanic White with at least a high school degree. Women and men differ with regards to reported SHS, with husbands more likely than wives to report health shocks between 1998 and 2000 (12.1% vs. 7.8%, respectively). Also, women were more likely than men to experience the death of their spouse from 1998 to 2000 (5.2% vs. 2.2%, respectively).

Table 2 shows the mean levels of depressive symptoms and self-reported health for respondents across each wave and significance tests, by SHS and gender. Among both women and men at each wave, with the exception of men's depression in 2004, respondents who experience a SHS report higher levels of depressive symptoms and poorer self-reported health than those without such an experience. With the exception of self-reported health in 1998 and 2008, compared to women, men whose partners experienced a SHS report lower levels of depression and poorer self-reported health. This table

Table 2. Respondent Depressive Symptoms and Self-Reported Health by Health Shock Experience and Gender.

	Women			Men		
	No spousal Health shock	Spousal Health shock	*N*	No spousal Health shock	Spousal Health shock	*N*
Depression 1998 (0-8)	1.38	1.64**	3,688	1.03	1.28**	4,044
Depression 2000	1.43	1.72**	3,688	1.07	1.26*	4,044
Depression 2002	1.35	1.80***	3,372	1.02	1.29**	3,525
Depression 2004	1.36	1.71***	3,187	1.03	1.03	3,226
Depression 2006	1.39	1.82***	3,037	1.00	1.14	2,996
Depression 2008	1.33	1.55*	2,876	1.01	1.09	2,745
Self-reported health 1998 (1-5, 5 = poor)	2.66	2.79*	3,688	2.70	2.79	4,044
Self-reported health 2000	2.62	2.72	3,688	2.66	2.88***	4,044
Self-reported health 2002	2.66	2.78*	3,451	2.73	2.93**	3,684
Self-reported health 2004	2.74	2.81	3,283	2.82	2.99*	3,388
Self-reported health 2006	2.78	2.82	3,118	2.80	3.00**	3,106
Self-reported health 2008	2.83	2.97*	2,974	2.88	2.95	2,840

Note: *$p \leq .05$. **$p \leq .01$. ***$p \leq .001$ indicating significant differences between spousal health shock experience, by gender.

provides preliminary evidence that a SHS has an influence on the other partner's health that is both robust and persists over time.

Depression

Table 3 shows the full latent growth models of the influence of a SHS on the respondents' trajectories of depressive symptoms by gender. For women, a SHS between 1998 and 2000 has a significant positive effect on the intercept of depressive symptoms compared with women who did not experience a SHS during this time, although there is no significant effect on the slope. Therefore, the levels of depressive symptoms among women who experienced a SHS remain significantly higher for up to a decade compared to women who did not experience a SHS (these groups experience parallel trajectories in mental health over time). This persistent mental health impact for women (net of controls, including spouse's later health shocks, spousal disability, or spousal death) is depicted in Figure 1.

Among men, those who experience a SHS are not significantly different in their trajectories of depressive symptoms from those who did not experience a SHS. Interestingly, men who experienced a SHS between 1998 and 2000 actually have a slightly decreasing trajectory of depressive symptoms compared to

Table 3. Growth Models of the Influence of Spousal Health Shock on Respondent Depressive Symptom Trajectories.

	Women		Men	
Covariates	Intercept (α)	Slope (β)	Intercept (α)	Slope (β)
Spouse health shock 1998-2000	0.139*	–0.010	–0.003	–0.031
Depression 1998	0.442***	–0.017***	0.462***	–0.020***
Age	–0.004	0.002	–0.005	0.005***
Hispanic	0.077	–0.075*	–0.013	–0.013
Black	0.141	–0.089**	0.090	–0.035
Other	0.450*	–0.128	0.010	–0.072
Education	–0.041***	0.003	–0.025***	–0.005*
Currently working	–0.166**	0.008	–0.063	0.027
Any health insurance	–0.141	0.021	–0.147	–0.025
Wealth (logged)	–0.088***	–0.005	–0.073***	–0.001
Spousal death 1998-2000	0.730***	–0.221***	1.298***	–0.286***
Spousal death 2000-2008	0.236***	0.097***	0.045	0.155***
Spouse health shock 2000-2008	–0.011	0.010	–0.128**	0.033*
Number of health conditions	0.191***	0.011	0.135***	0.015*
Divorce 1998-2000	0.410	0.058	0.206	–0.314
Divorce 2000-2008	0.332	0.046	0.737***	–0.027
Spousal disability 1998-2000	–0.019***	–0.019	0.055**	–0.013
Spousal disability 2000-2008	0.111	0.016***	0.015	0.011**
RMSEA	0.020			
χ^2 (*df*)	329.66 (128)***			
TLI	0.978			
CFI	0.986			

Note: *$p \leq .05$. **$p \leq .01$. ***$p \leq .001$.
CFI = Confirmatory Fit Index; RMSEA = Root Mean Square Error of Approximation; TLI = Tucker Lewis Index.

those men without a SHS, although this finding is not significant. The trajectories of depressive symptoms for men are depicted in Figure 1.

Considering briefly the other covariates in Table 3, perhaps most interesting is that spousal disability between 1998 and 2000 is associated with lower depressive symptoms (intercept) for women but more depressive symptoms for men. In contrast, women with a spousal death between 2000 and 2008 are seen to have a higher intercept; this is not significant for men. Few variables affect how the levels of depressive symptoms change over time (slope). Notably, depression in 1998 and spousal death between 1998 and 2000 exhibit significant negative effects on the slope (depressive symptoms decrease at a faster rate) for men and women, while spousal disability or death between 2000 and 2008 have significant positive effects.

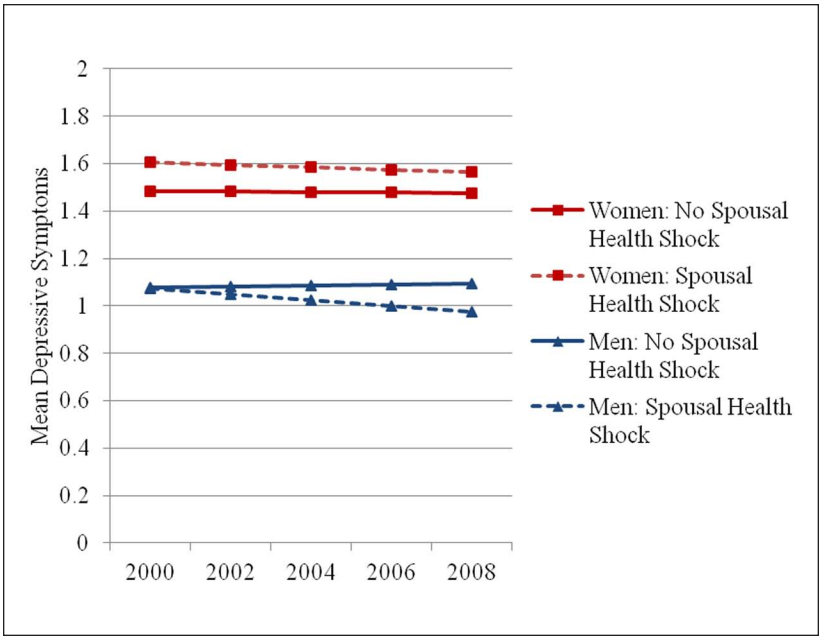

Figure 1. Spousal health shock predicting respondent depressive symptoms.

Self-Reported Health

Table 4 shows the full growth curve model for the influence of a SHS on respondent self-reported health by gender. For women, a health shock to their spouse has no significant effect on their immediate (intercept) or long-term trajectory (slope) of self-reported health (see Figure 2). Recalling that the indicator of self-reported health is reverse coded so that a high score indicates worse health, among men the onset of a SHS is significantly associated with poorer self-reported health (a positive coefficient) that persists over time. The slope for SHS is not significant, though, which means that the trajectories of self-reported health are parallel for men with and without a SHS between 1998 and 2000. This relationship is presented in Figure 2.

Examining the direct effects of the other covariates in Table 4, in particular we find that men who experienced a SHS between 2000 and 2008 experience better self-reported health at baseline (intercept). While women with a spousal death between 2000 and 2008 experience better self-reported health over time (slope), spousal disability exhibits a significant positive effect on the slope.

Table 4. Growth Models of the Influence of Spousal Health Shock on Respondent Self-Reported Health Trajectories.

	Women		Men	
Covariates	Intercept (α)	Slope (β)	Intercept (α)	Slope (β)
Spouse health shock 1998-2000	–0.026	–0.001	0.136***	–0.012
Self-reported health 1998	0.581***	–0.029***	0.512***	–0.026***
Age	0.004**	0.003***	0.005**	0.003***
Hispanic	0.111*	0.023	0.046	0.013
Black	0.069	0.003	0.095*	–0.023
Other	0.147	–0.028	0.005	0.021
Education	–0.024***	0.003	–0.029***	0.001
Currently working	–0.072**	0.000	–0.068**	0.010
Any health insurance	–0.064	–0.012	0.078	–0.068**
Wealth (logged)	–0.047*	–0.004	–0.036***	–0.010**
Spousal death 1998-2000	–0.103	0.034	–0.051	–0.024
Spousal death 2000-2008	0.041	–0.023*	–0.018	–0.019
Spouse health shock 2000-2008	–0.023	–0.001	–0.058*	0.004
Number of health conditions	0.130***	–0.001	0.124***	0.003
Divorce 1998-2000	–0.049	–0.075	–0.574	0.359**
Divorce 2000-2008	–0.062	0.005	0.163	–0.056
Spousal disability 1998-2000	–0.025	0.017***	0.016	–0.005
Spousal disability 2000-2008	–0.001	0.006**	0.005	0.001
RMSEA	0.018			
χ^2 (df)	389.71 (128)			
TLI	0.990			
CFI	0.994			

Note: *$p \leq .05$. **$p \leq .01$. ***$p \leq .001$.
CFI = Confirmatory Fit Index; RMSEA = Root Mean Square Error of Approximation; TLI = Tucker Lewis Index.

Discussion

We examine the effect of a SHS on the short- and long-term health trajectories of the partner while accounting for spousal mortality. Results show that the onset of a severe health condition among spouses worsens the depressive symptoms of women but the self-reported health of men, suggesting that men and women respondent differently to life events (Ayotte et al., 2010; Hagedoorn et al., 2001). Net of controls, women experience a significant and lasting mental health impact of a SHS. For men, there was no significant difference in their mental health. In contrast, a SHS had no effect on women's self-reported health but is associated with poorer self-reported health among men, which continues over time.

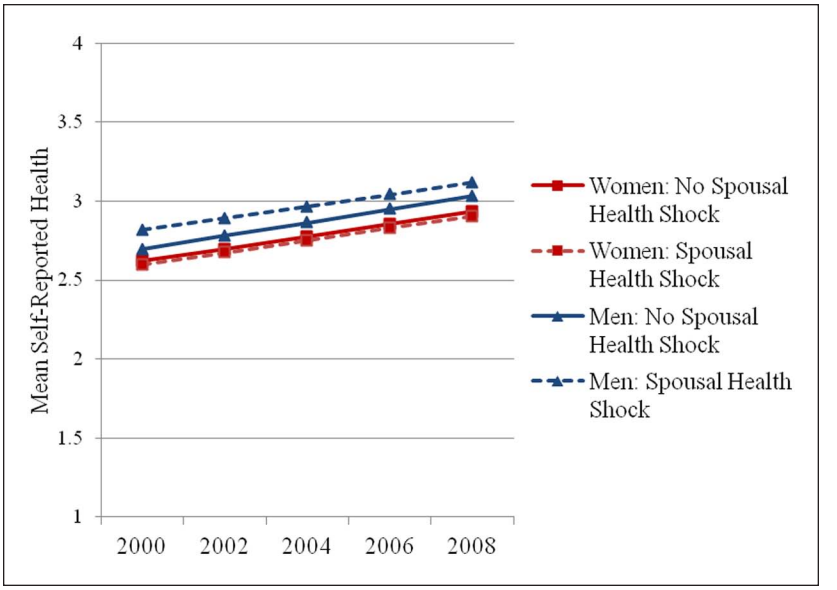

Figure 2. Spousal health shock predicting respondent self-reported health.

Although the findings are significant, their magnitude is small as reflected in the graphs. This is to be expected given that we are examining the long-term net impact of a singular health incident. Thus, the significant findings suggest a pattern of cumulative disadvantage.

There are several limitations. First, we use self-reported health as an indicator of physical health. Although based on prior research demonstrating predictive validity for cause-of-death specific mortality and morbidity based on physician assessment (Ferraro & Farmer, 1999; Rogers et al., 2000), we recognize that self-reported health is a global health measure and at least partly reflects mental well-being. Second, although we account for the prevalence of spousal health conditions, the ability to measure severity would be more desirable, as our effects are likely underestimated. Additionally, due to small sample sizes of the health shocks, we cannot examine conditions separately or by cohort. Third, while social support and caregiving have been shown to be associated with health (Hahn et al., 2011; Turner et al., 2004), the RAND HRS data do not include these measures. Therefore, we are unable to determine whether these factors influence the association between spousal health and health of the partner. Finally, although we control for future SHSs, our current analysis focuses on

identifying the impact of a health shock between the first two waves 1998 to 2000, and tracing the rippling effect of this single shock across successive waves 2000 to 2008. This likely understates the effects of a health shock as negative health events will occur throughout the succeeding intervals that will have additional effects. Future research should examine the possible cascading health shocks across successive waves to examine varying health trajectories.

Despite these limitations, this research has several strengths and makes important contributions to our knowledge about the relationship between spouses and health effects among older adults. The longitudinal data allow us to examine the effects of a health shock over a period of 10 years, allowing for the exploration of immediate and long-term effects. Findings show that the onset of a severe health condition immediately affects the well-being of one's spouse, and this health disadvantage continues over time, possibly impacting later life health trajectories and eventual mortality. We examine variations by gender, finding that while women experience an increase in depressive symptoms, men experience declines in self-reported health. This difference in gender speaks to the past literature, which suggests women tend to internalize grief, thus impacting their mental health, whereas men tend to externalize resulting in poorer physical health (Rosenfield, 1999; Simon, 2002). Perhaps this may be attributed to gendered divisions of labor. For instance women predominantly take the role of caregiver, which is associated with poorer mental health (Strawbridge, Wallhagen, Shema, & Kaplan, 1997). In heterosexual couples, if a woman has a health shock, her husband may assume the unfamiliar role of household labor such as cooking while caring for his health, which may explain the deleterious effects on self-reported health for men and not women.

Additionally, we are able to study the effect of spousal health while accounting for the impact of spousal mortality. That the onset of a severe condition has an impact on spouses' health separate from that of mortality speaks to the need for the widowhood literature to address the effects of pre-widowhood and the importance of health trajectories prior to a spouse's death. These findings also suggest that future research on spousal concordance take into account that spouses not only tend to mirror each other's health behavior and patterns but also that a major change in one's health, such as the onset of a severe health condition, has significant implications for the health and well-being of their spouse.

In conclusion, these findings suggest the social context of spouses is important to consider when examining health. This is especially true in older adulthood as health-related stressors accumulate and spouses become the most important source of support and caregiving.

We believe that this study addresses an important gap in various areas of literature, and has implications for policy and health care providers. If couples begin to experience declines in health together, it can have implications for caregiving and long-term care utilization (Meyler et al., 2007). Policymakers should not only target recovery of the sick, but also provide resources for family well-being in an effort to prevent spousal concordance in negative health trajectories. Understanding the health risks that come from social ties and, especially, the impact of one partner's health on the other, will allow more effective prevention and treatment efforts.

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