The Consequences of Hearing Impairment on Spousal Mental Health*

*Working Paper

Jessica S. West, MPH
PhD Candidate
Department of Sociology
Duke University

Abstract

Disablement is a significant health problem and chronic stressor for older adults and is associated with negative mental health outcomes. Although some research has explored how disability extends beyond individuals to influence the mental health of their support networks, less population-based research has assessed the consequences of hearing impairment. The current study builds on stress proliferation, gender, and marriage research using data from the 1998 wave of the Health and Retirement Study to estimate the association between hearing impairment in one spouse and depressive symptoms in the other. The next step is to employ nine waves (1998-2014) and use a fixed effects model to test this relationship. Preliminary analyses using the 1998 wave reveal that female hearing impairment is associated with an increase in male depressive symptoms, but that the relationship between male hearing impairment and female depressive symptoms is explained by male depressive symptoms and poor self-rated health.

Introduction

Disability is a growing health concern affecting roughly one out of eight Americans (13%), with that number increasing to 37.4% among persons over age 65 (US Census Bureau 2016). People with disabilities are more likely to report experiencing psychological distress, lower positive affect, higher negative affect, being denied health care, and engaging in unhealthy behaviors (e.g. smoking, at-risk drinking levels, sedentary behavior) than people without disabilities (Bierman and Statland 2010, Caputo and Simon 2013, Pharr and Bungum 2012, World Health Organization 2011). In their classic work on disablement, Verbrugge and Jette (1994) argued that the lower psychosocial well-being associated with disability may result from unmet social needs, as functional limitations can prevent individuals from performing their desired social roles.

In addition, the consequences of disability extend beyond individuals to those who care for them, including parents of young children, spouses, and adult family members for the elderly. However, more research is needed to understand the consequences of disability (in general) and hearing impairment (specifically) on those in their support networks (Borren et al. 2015). This is important because people exist in social networks and the emergence of health problems can affect both individuals and those close to them (Elder, Johnson and Crosnoe 2003). The development of disability may be particularly salient in marital relationships because spouses experience disability through the partner's impairment, which is called third-party disability (World Health Organization 2017). This concept is similar to the sociological notion of stress proliferation. Originally, stress proliferation explained how stress experienced in one situation (e.g. chronic illness) leads to the accumulation of stressors in other situations (e.g. financial strain from being unable to work) (Pearlin 1989, Pearlin, Aneshensel and LeBlanc 1997). Stress

proliferation has been extended to describe the collateral consequences when one person's stress spills over to others (Avison 2010, Pearlin et al. 2005, Thoits 2010). Research in this vein is limited to qualitative studies or small, cross-sectional studies, as few nationally representative datasets include comprehensive data on spouses. As the U.S. population continues to age, understanding how the disablement process affects not only individuals with disabilities but also those that care for them is critical for reducing the negative consequences of a growing public health concern.

The current study contributes to this literature in two ways. First, it adds to research on marriage, family, and gender by exploring the relationship between disability in one spouse and mental health outcomes in the other spouse. Second, the study uses the Health and Retirement Study (HRS), a nationally representative, longitudinal survey that has detailed data on spouses of the main survey participants.

Background

Stress Proliferation and Linked Lives

Research over the past 70 years has demonstrated that stress undermines physical and mental health (Institute of Medicine 2001). Chronic strains are one important type of stressor and are defined as ongoing, long-term difficulties that negatively affect well-being, such as living in poverty or having a chronic illness (Pearlin 1989). Chronic stressors can be a source of stress proliferation, which has traditionally been used to explain how stressors associated with one event (e.g., incarceration, chronic illness) can lead to the accumulation of stressors in other aspects of life (e.g., divorce resulting from incarceration, financial strain due to the inability to find work) (Pearlin 1989, Pearlin, Aneshensel and LeBlanc 1997, Turney 2014). According to stress proliferation theory, experiencing poor health throughout adulthood can have spillover

effects, especially regarding social and economic attainment. For example, hearing impairment is associated with early retirement (Danermark and Gellerstedt 2004), occupational or career immobility (Mowry and Anderson 1993), and the inability to participate fully in the job market (Hallberg and Carlsson 1991).

In addition to describing the spillover effects from one situation to another, stress proliferation has more recently been used to assess the consequences of one person's stressors on others (Avison 2010, Pearlin et al. 2005, Thoits 2010). When stress proliferates from parents to children, for example, parents' stressors in the form of poverty, poor working conditions, or divorce can spill over and become stressors for children (Thoits 2010). Thus, parental stressors can have lasting mental and physical health consequences for children. For example, adolescent children of mothers with severe hearing impairment have worse mental health than adolescent children of mothers without hearing impairment (Borren et al. 2015), suggesting that the stress associated with disability can proliferate to family members.

The ability of stressors to spill over from one person to another illustrates the life course principle of linked lives. This principle indicates that people are embedded in social networks. Rather than suggesting that social changes only have an effect through their direct impact on individuals, the life course perspective understands that these changes can affect individuals indirectly through other people (Elder Jr., Johnson and Crosnoe 2003). Family members, in particular, are interdependent and serve as important sources of both social influence and connection at every stage of the life course (Thomas, Liu and Umberson 2017, Umberson, Crosnoe and Reczek 2010).

Gender and Health Contingencies within Marriage

One type of family relationship that has received a great deal of attention is the marital relationship. For decades, research has reported the health benefits of marriage. These studies show that, compared to unmarried people, married people have less psychological distress, are less often depressed, report fewer physical health problems, and have better overall physical health (Carr and Springer 2010, Frech and Williams 2007, Simon 2014, Waite and Gallagher 2000). Some research argues that the protective effect of marriage may not be as strong once spouses report worse levels of health, suggesting that married individuals may overestimate their health (Zheng and Thomas 2013). However, taken altogether, this research indicates that spouses are an important resource.

Research also suggests that the experience of marriage may vary by gender. From a stress process perspective, the effect a chronic stressor has on health may depend on core social status characteristics (Aneshensel, Phelan and Bierman 2013, Pearlin and Bierman 2013), including gender, race/ethnicity, and socioeconomic status. Given that marital role expectations vary for women and men (Moen 2001), gender is a core social status characteristic that may influence the relationship between disability and spousal mental health and lead to different experiences of depressive symptoms for men and women. Gendered expectations of spouses result in men and women experiencing marriage differently (Thomeer, Umberson and Pudrovska 2013). Such gendered expectations contribute to asymmetric caregiving in which men are more likely to rely exclusively on a spouse for companionship, emotional support, and caregiving (Umberson et al. 1996) while women are expected to provide emotional and instrumental support to their husbands (Spitze and Ward 2000). In addition, husbands and wives experience marital strain differently. Research finds that self-reports of marital strain are associated with higher levels of frustration among both husbands and wives; however, only wives report higher levels of sadness

and worry in response to such strain while only husbands experience lower levels of worry in response to reports of support (Carr, Cornman and Freedman 2016). This asymmetry leads men to be less effective caregivers when they are called upon to perform care-related tasks (Thomeer, Umberson and Pudrovska 2013, Thomeer, Reczek and Umberson 2015).

Changes in health status are also important to consider within marital relationships. As individuals age, one of the most common stressors is the emergence or worsening of physical and cognitive decline for one or both spouses (Muramatsu, Yin and Hedeker 2010). Stress proliferation may be particularly important in marital relationships in which one partner has a disability because of third-party disability, which occurs when a significant other does not have a health condition but experiences disability through the partner's impairment (World Health Organization 2017). Moreover, while spouses are key sources of physical and emotional support, they can be even more important to the social lives of adults with a physical disability, as research reports a preference for receiving support from spouses before other sources (Carr and Moorman 2011). Therefore, the increase in physical health problems at older ages may elicit more stressors and, by extension, more stress proliferation among married couples as they age.

Some research on caregiving within the marital relationship has specifically explored marriages in which one partner is health-impaired. This research finds evidence that wives are more likely to experience stress when caring for a health-impaired spouse because of additional tasks they must perform related to their spouses' emotional well-being (Thomeer, Reczek and Umberson 2015). Negative marital quality buffers the effect of physical disability on levels of loneliness for husbands but not for wives, suggesting that demands, criticism, or "nagging" in the context of supportive relationships have health benefits for men but not necessarily for women (Warner and Adams 2016). Similarly, negative marital experiences are associated with a slower

increase in cognitive limitations over time; however, this association does not differ for men and women (Xu, Thomas and Umberson 2016). Although this finding is inconsistent with previous research that documents an inverse association between negative marital experiences and physical health (e.g., Umberson et al. 2006), other studies have reported that moderate, short-term stress slightly elevates cortisol levels which, in turn, sharpen cognitive functioning (de Kloet, Oitzl and Joëls 1999). Other research on marital caregiving finds that wives providing only personal care (i.e., care related to activities of daily living) to health-impaired spouses report more depressive symptoms than wives providing only instrumental care (i.e., care related to instrumental activities of daily living), while the mental health of husbands providing only personal or only instrumental care does not differ (Kim et al. 2017). This research contributes to our understanding of the gendered experience of caregiving for health-impaired spouses.

Hearing Impairment and Spouses

Despite a large body of literature on the marital relationship, comparatively less research has explored stress proliferation in the context of marriages in which one partner has a hearing impairment. Hearing impairment may be a particularly important disability to study in marital contexts since it affects communication. Hearing is a fundamental physical resource connecting one to the social and physical environments (Verbrugge and Jette 1994). When poor hearing affects communication, interactions become impaired, which can reduce quality of life (Dalton et al. 2003, Russ et al. 2018). A better understanding of the communication difficulties that may arise in marriages in which one partner has impaired hearing is important because 15.0% of adults aged 20 or older are projected to have a hearing impairment in 2020 and 22.6% by 2060 (Goman, Reed and Lin 2017).

Qualitative research studies provide important insights regarding the experience of hearing impairment within marital relationships. For example, in one study, semi-structured interviews were conducted with eight couples in which one spouse had a hearing impairment. Results indicate that the onset of impaired hearing often requires spouses to assume additional responsibilities and roles, including providing communicative assistance and emotional support (Yorgason, Piercy and Piercy 2007). Another qualitative study of ten non-impaired spouses (five females, five males) revealed that the effects of hearing impairment on spouses include avoiding social situations, frustration with communication, and altered home environments (due to increased volume of the television) (Scarinci, Worrall and Hickson 2008). The in-depth interviews with these same ten individuals was also analyzed and linked to the International Classification of Functioning, Disability, and Health (ICF) domains to show that the spouses of people with impaired hearing experience third-party disability (Scarinci, Worrall and Hickson 2009b). Data from these interviews was then used to develop the 36-item Significant Other Scale for Hearing Disability (SOS-HEAR) (Scarinci, Worrall and Hickson 2009a). Subsequent research using the SOS-HEAR in a sample of one hundred normally-hearing spouses over the age of 50 in Australia reveals that spouses experience third-party disability in areas related to communication changes, use of communication strategies, and emotional problems (e.g. feeling frustrated or angry) (Scarinci, Worrall and Hickson 2012). This research contributes to knowledge about the experiences of spouses whose partners have a hearing impairment.

However, research using population-based, longitudinal data on the experience of hearing impairment within marriages is currently limited. In two recent reviews, both Bainbridge and Wallhagen (2014) and Kamil and Lin (2015) found only two studies that used large epidemiologic datasets to study the effect of hearing impairment on spouses. Using the Alameda

County Study, Wallhagen et al. (2004) assessed the odds of spouses developing physical, mental, or social health problems five years after baseline measurement. Results show that the spouse of a person with hearing loss is more likely to report poor physical functioning, not feeling happy, symptoms of depression, and having less energy than is expected for one's age. In contrast, Ask, Krog and Tambs (2010) compared spouses of people with and without hearing loss in the Nord-Trøndelag Health Study based in Norway. Results indicate that spouses of people with hearing loss do *not* exhibit greater symptoms of decreased subjective well-being, depression, or anxiety. Given the conflicting findings of these studies, the association between hearing impairment and spousal mental health remains uncertain.

Current Study

Research on family, gender, and disability is currently lacking a longitudinal, nationally representative examination of the relationship between disability and spousal mental health, and research that does exist reveals conflicting results. The current study aims to address these gaps by using a population-based, longitudinal sample of older adults. Specifically, I will use the Health and Retirement Study (HRS) to assess: 1) to what extent does hearing impairment influence spouses' depressive symptoms?; and 2) does the relationship between hearing impairment and spousal depressive symptoms depend on the gender of the non-hearing-impaired spouse?

Data and Methods

Data

The Health and Retirement Study (HRS) is a longitudinal, nationally representative survey of US adults over the age of 50 and their spouses. The study has been conducted every

two years since 1992 with a multi-stage area probability sample of households that oversamples blacks and Hispanics. The core survey, which is asked of all participants at each wave, monitors age-related changes in cognitive, physical, and functional health and includes questions about employment, income, wealth, retirement, family structure, health, and health care utilization. The spouses of HRS participants are also recruited and surveyed, regardless of their age.

The core HRS starting sample is 37,495 individuals. The sample is restricted to participants who report having a spouse and to participants and their spouses who were alive and responded in 1998. Since 95.53% of the sample only ever reports having one spouse, participants who report multiple spouse (due to remarriage after divorce or widowhood) are removed from the sample. The 24 same-sex partners were removed from the sample as the number of same-sex partners is too small to yield stable estimates. The sample is also limited to participants who were over the age of 50. Missing data was removed using listwise deletion. The final sample consists of 8,731 total individuals (4,196 female main respondents and their male spouses, and 4,535 male main respondents and their female spouses).

Depressive Symptoms

Depressive symptomology is based on a summed score of responses to an eight-item version of the Center for Epidemiologic Studies Depression Scale (CES-D), a screening test for depression and depressive disorder (Radloff 1977). Items in the scale ask about having restless sleep, feeling lonely, feeling sad, feeling depressed, not being able to get going, feeling that everything was an effort, enjoying life, and feeling happy. Participants reported whether the statements were true much of the time during the past week (no/yes). Responses are summed and range from zero to eight. Higher scores indicate more depressive symptoms.

The HRS includes CES-D measures for both main participants and spouses. Previous research finds that individuals whose spouses have high levels of depressive symptoms are likely to develop significantly more depressive symptoms over time (Butterworth and Rodgers 2006, Holahan et al. 2007, Siegel et al. 2004, Thomeer, Umberson and Pudrovska 2013). Therefore, spousal CES-D scores are the outcome variable and main participants' CES-D scores are included as a control.

Disability: Hearing Impairment

Since auditory tests require expensive equipment, trained technicians, and strict controls on background noise (Bagai, Thavendiranathan and Detsky 2006), they are not usually feasible for assessing hearing impairment in community-based samples. Instead, the HRS employed two self-report questions to assess participants' hearing impairment. First, participants were asked to report their use of a hearing aid (no/yes). Second, all participants were asked to rate their hearing (while wearing a hearing aid as usual, if relevant) on a five-point scale (excellent, very good, good, fair, poor). For the current analysis, self-rated hearing is dichotomized into no hearing impairment (excellent, very good, or good hearing) versus hearing impairment (fair or poor hearing). Participants' spouses were also asked to self-rate their hearing, but the RAND HRS Longitudinal File does not include a separate item for spouse hearing. Instead, I separated spouses' hearing responses from main respondents' hearing responses by matching based on household and person number identifiers.

Control Variables

The HRS collects detailed information on both main participants and their spouses, which I organize into two groups: individual-level variables (separate variables collected for both

participants and spouses) and household-level variables (one variable collected per household). Control variables at the individual level include gender (male; female), age (continuous), race/ethnicity (non-Hispanic white; non-Hispanic black; non-Hispanic other race; Hispanic), and highest degree earned (less than high school; high school or equivalent; some college; or college and above). Hearing aids have been shown to reduce the odds of depressive symptoms (Mener et al. 2013), so the analysis includes a dichotomous measure of hearing aid usage (no; yes). Self-rated health is included as a global measure of health status (excellent, very good, good, fair, poor) for both main respondents and their spouses. Two health behaviors are also included: smoking status (never smoker=reference, past smoker, current smoker) and number of drinks per week (zero or does not drink=reference, 1-14 drinks, 15 or more drinks).

Control variables at the household level include length of marriage (continuous, reported in years) and wealth (logged continuous variable), which measures total household assets while subtracting out debt (Bugliari et al. 2016). Since parenthood may influence mental health (Kalucza, Hammarström and Nilsson 2015), a variable indicating parental status was created using two variables: number of children ever born and number of living children (both continuous). Combining the variables produces a variable indicating whether or not participants have children. Research finds that greater age gaps between spouses are associated with worse mental health outcomes (Choi and Vasunilashorn 2014, Pradeep and Sutin 2015). Therefore, a variable for the age difference between spouses was created by subtracting the age of the younger spouse from the age of the older spouse (continuous variable, years).

Analysis

Table 1 presents descriptive statistics for the sample in 1998. Table 2 currently uses ordinary least squares (OLS) regression models to estimate the association between the main

respondent's hearing impairment and the spouse's depressive symptoms. A fixed effects model is a longitudinal model that treats unobserved, time-invariant variables that differ across individuals as a set of fixed parameters that can be swept out of the equation (Allison 2009). The model controls for variables that either cannot or have not been measured and allows those variables to have an association of any kind with the measured variables. Thus, the model captures only within-individual differences (i.e. change), which makes it less subject to unobserved confounding than other models while simultaneously reducing its efficiency. The main requirements of a fixed effects model are that the dependent variable is measured on at least two time points for every individual and that the predictor variables change in value across those time points for a large set of the sample (Allison 2009).

The basic fixed effects model can be expressed as follows:

$$y_{it} = \mu_i + \beta hearing_{it} + \gamma x_{it} + \alpha_t + \varepsilon_{it}$$

where y_{it} is the number of depressive symptoms for an individual *i* at time *t*, and x_{it} is the vector of control variables. The parameter $\beta hearing$ represents the effect of the focal analysis measure (self-rated hearing), or the change in self-rated hearing from 1998-2014. The μ_i term accounts for both observed and unobserved stable traits between individuals while the α_t term accounts for year fixed effects, therefore capturing trends that are constant across individuals over time.

Preliminary Results

Table 1 presents sample characteristics by the gender of the main respondents and the spouses in 1998. Women report a higher mean level of depressive symptoms than men (1.45 compared to 1.10). Around 23% of men reported a hearing impairment compared to 9% of women. The sample is predominantly comprised of non-Hispanic whites (around 80% of both men and women). This is not necessarily problematic for this study, as research reports that

hearing loss prevalence varies across racial/ethnic groups, with whites experiencing a disproportionate burden of hearing loss (Agrawal, Platz and Niparko 2008). Further, although blacks are more likely to have their hearing tested and whites are more likely to wear hearing aids (Nieman et al. 2016), researchers suggest that this is not reflective of differential socioeconomic status, but rather to some protective effect of black race (Lin et al. 2011).

Tables 2 and 3 presents the OLS regression coefficients identifying factors associated with depressive symptoms. Note that race and education are not included because these variables are time-invariant and therefore cannot be included in fixed effects models. Following previous research, I sequentially added three blocks (demographic, health, health behaviors) of covariates using stepwise regression.

Table 2 shows the relationship between female main respondents' hearing impairment and their male spouses' depressive symptoms. Model 1 reveals female hearing impairment is associated with an increase in male depressive symptoms, and this relationship persists across all of the models. Adding basic demographic variables (Model 2) slightly attenuates the relationship, but it is still statistically significant. In Model 3, female depressive symptoms are associated with an increase in male depressive symptoms, as was expected. Importantly, the relationship between female hearing impairment and male depressive symptoms remains over and above the addition of female depressive symptoms to the model. In the final model, adding health behaviors does not influence the main relationship.

Table 3 shows the relationship between male main respondents' hearing impairment and their female spouses' depressive symptoms. At baseline, male hearing impairment is associated with an increase in female depressive symptoms. The relationship persists when demographic variables are added (Model 2). However, the relationship loses significance in the third model

when health variables are added. Specifically, male depressive symptoms and worse self-rated health are associated with an increase in female depressive symptoms.

It is also important to note that spouses' hearing impairment is included in each model. In both Tables 2 and 3, spousal hearing impairment is significantly associated with an increase in spousal depressive symptoms, regardless of the inclusion of covariates. This is consistent with previous research which finds that self-rated hearing is associated with a significant increase in depressive symptoms among individuals (West 2017). In the current study, hearing impairment in the main respondent remains a significant predictor of spousal depressive symptoms over and above the spouse's own depressive symptoms.

Limitations

One limitation is that the study could only analyze heterosexual couples due to the small, unrepresentative number (n=20) of same-sex partners in the sample. Research by Kelly and Atcherson (2011) suggests that significant others in same-sex relationships (n=10) with a partner with hearing impairment have both similar and different experiences to significant others in heterosexual relationships (n=10). Therefore, more research is needed to explore the relationship between hearing impairment and mental health outcomes among same-sex couples.

Next Steps

The current analysis using the 1998 wave of the HRS indicates that hearing impairment in one spouse is associated with an increase in depressive symptoms in the other spouse. This relationship has a gendered component in that it appears particularly strong and persistent for husbands whose wives have hearing impairment. The next step for the current study is to use nine waves of the HRS to examine this relationship over time.

Table 1 Sample characteristics: HRS 1998 (n=8,731).

	Main Respondent	**Spouse**	**Main Respondent**	**Spouse**
	Female	Male	Male	Female
	4,196	4,196	4,535	4,535
Individual variables				
CES-D				
Mean (sd)	1.45 (1.86)	1.10 (1.56)	1.11 (1.57)	1.45 (1.85)
Range	0-8	0-8	0-8	0-8
Has hearing loss	9.29	23.59	23.15	9.24
Wears hearing aid	1.22	4.62	4.41	1.17
Age, mean (sd)	62.87 (8.40)	65.58 (8.75)	64.96 (8.71)	61.51 (9.37)
Race				
NH White	82.51	82.75	82.25	81.90
NH Black	9.10	9.20	9.31	9.26
NH Other	1.48	1.48	1.70	1.68
Hispanic	6.91	6.58	6.75	7.17
Education				
<high school	20.97	23.90	23.22	20.22
High school/GED	41.47	33.44	33.08	41.04
Some college	22.12	18.97	19.34	22.45
College+	15.44	23.69	24.37	16.30
Smoking status				
Never smoker	52.29	26.67	26.70	52.13
Past smoker	34.44	57.60	57.40	34.05
Current smoker	13.27	15.73	15.90	13.83
Drinks per week				
Does not drink	73.52	59.18	58.88	72.99
1-14 drinks	25.14	35.39	35.52	25.58
15+ drinks	1.33	5.43	5.60	1.43
Household variables				
Age difference				
Mean (sd)	3.90 (3.61)		4.33 (4.08)	
Range	0-32		0-32	
Wealth (median)	$182,300.00		$178,000.00	
Children				
Any kids	96.57		96.63	
No kids	3.43		3.37	
Marriage length				
Mean (sd)	36.31 (13.88)		35.06 (14.33)	
Range	0.1-70.5		0.1-70.5	

Notes: sd=standard deviation. NH=Non-Hispanic.

Table 2 Ordinary least squares regression coefficients for depressive symptoms among female main respondents and their male spouses: HRS 1998 (n=4,196).

	MODEL 1		MODEL 2		MODEL 3		MODEL 4	
	Coefficient	**SE**	**Coefficient**	**SE**	**Coefficient**	**SE**	**Coefficient**	**SE**
R fair/poor hearing	0.503***	0.082	0.429***	0.081	0.191*	0.077	0.191*	0.078
S fair/poor hearing	0.456 ***	0.056	0.424***	0.056	0.186***	0.053	0.174**	0.053
R age			0.003	0.007	-0.005	0.006	-0.006	0.006
S age			0.000	0.007	-0.003	0.006	0.000	0.006
Age difference			0.036***	0.009	0.026**	0.008	0.025**	0.008
Length of current marriage			-0.002	0.002	-0.002	0.002	-0.002	0.002
No kids			0.040	0.130	0.041	0.122	0.051	0.122
Log of wealth			-0.072***	0.007	-0.031***	0.007	-0.029***	0.007
R use hearing aids			0.008	0.215	0.171	0.201	0.177	0.201
S use hearing aids			-0.291***	0.113	-0.188	0.106	-0.190	0.106
R depressive symptoms					0.138***	0.013	0.138***	0.013
R self-rated health					0.007	0.023	-0.001	0.023
S self-rated health					0.419***	0.021	0.413***	0.021
R never smoker (ref)								
Past smoker							0.001	0.049
Current smoker							-0.026	0.072
S never smoker (ref)								
Past smoker							-0.027	0.053
Current smoker							0.072	0.075
R does not drink (ref)								
1-14 drinks							-0.091	0.058
15+ drinks							-0.474*	0.197
S does not drink (ref)								
1-14 drinks							-0.045	0.052
15+ drinks							0.265*	0.103
Constant	0.951***	0.028	1.58***	0.205	0.510*	0.201	0.493*	0.207

Notes: SE= standard error. R=main respondent. S=spouse.

Table 3 Ordinary least squares regression coefficients for depressive symptoms among male main respondents and their female spouses: HRS 1998 (n=4,535).

	MODEL 1		MODEL 2		MODEL 3		MODEL 4	
	Coefficient	**SE**	**Coefficient**	**SE**	**Coefficient**	**SE**	**Coefficient**	**SE**
R fair/poor hearing	0.282***	0.064	0.233***	0.064	0.033	0.061	0.036	0.061
S fair/poor hearing	0.993***	0.094	0.865***	0.093	0.446***	0.088	0.447***	0.088
R age			-0.004	0.009	-0.001	0.009	-0.002	0.009
S age			0.010	0.009	-0.002	0.008	-0.001	0.008
Age difference			0.021	0.011	0.006	0.010	0.006	0.010
Length of current marriage			0.002	0.003	0.001	0.002	0.002	0.002
No kids			0.138	0.150	0.200	0.139	0.190	0.138
Log of wealth			-0.098***	0.008	-0.041***	0.008	-0.039***	0.008
R use hearing aids			-0.366**	0.132	-0.307*	0.122	-0.302*	0.122
S use hearing aids			-0.180	0.250	-0.292	0.232	-0.268	0.232
R depressive symptoms					0.180***	0.017	0.180***	0.017
R self-rated health					0.566***	0.024	0.557***	0.025
S self-rated health					0.013	0.025	0.009	0.025
R never smoker (ref)								
Past smoker							-0.004	0.059
Current smoker							-0.026	0.084
S never smoker (ref)								
Past smoker							0.131*	0.056
Current smoker							0.2742**	0.080
R does not drink (ref)								
1-14 drinks							-0.007	0.059
15+ drinks							-0.150	0.116
S does not drink (ref)								
1-14 drinks							-0.088	0.065
15+ drinks							0.417	0.216
Constant							0.221	0.227

Notes: SE= standard error. R=main respondent. S=spouse.

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