Research Article

Activity Limitations and Depressive Symptoms Among Older Couples: The Moderating Role of Spousal Care

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Abstract

Objectives: Limitations in performing basic daily activities, as well as spousal caregiving that arises from activity limitations, are important factors that have ramifications for mental health among couples. The objective of this study was to investigate the interplay of these factors by focusing on whether the associations between activity limitations and depressive symptoms among coupled-individuals were moderated by receipt and provision of spousal care.

Methods: Longitudinal household data from the *Health and Retirement Study* (2004–2014; dyad $N = 6,614$) were analyzed to estimate within-person associations between one's own and spousal activity limitations, receipt and provision of spousal care, and depressive symptoms.

Results: Findings showed a consistent link between one's own activity limitations and depressive symptoms for both spouses, whereas spousal activity limitations were associated with depressive symptoms for wives only. We also found moderating effects of spousal care in the link between one's own and spousal activity limitations and depressive symptoms.

Discussion: Receipt and provision of activities of daily living-related assistance may contextualize the association between activity limitations and depressive symptoms among older coupled-individuals in a direction that could alleviate or aggravate the risk of depression.

Keywords: Activities of daily living, Caregiving, Disability, Health and Retirement Study, Instrumental support

Tens of millions of older adults in the United States currently live with daily activity limitations, including personal hygiene, mobility, and ability to feed oneself. The number of adults with these limitations is projected to rapidly increase in the coming decades due to prolonged longevity and growth in the older population (Freedman & Spillman, 2014). The trend poses significant challenges not only for individuals with such limitations, but also for their spouses, who are often the first in line to assume informal caregiver roles (Pinquart & Sörensen, 2011). The scientific literature shows that activity limitations are associated with depression (He et al., 2019; Monserud & Peek, 2014; Schieman & Plickert, 2007; Yang & George,

2005). Further, receiving and providing spousal care in the context of activity limitations is linked with psychological well-being for both the receiver and the provider of care (Carr, Cornman, & Freedman, 2017; Pinquart & Sörensen, 2006). However, the role of spousal care was rarely considered in earlier research investigating the link between activity limitations and depression. To address this gap, we investigated whether the linkages between activity limitations and depressive symptoms among coupled-individuals are moderated within the context of receiving and providing spousal care by utilizing longitudinal data from a large national sample of coupled-individuals.

Activity Limitations and Depression in Later Life

Activity limitations, defined here as difficulty performing basic activities of daily living required for independent living in the community, are key indicators of disability that occur at advanced stages of the disablement process (Wolf, 2015). Activity limitations are consistently associated with compromised well-being, including increased mortality risk (Hennessy et al., 2015), and many researchers have focused on depression as an adverse outcome associated with activities of daily living (ADL) limitations (He et al., 2019; Monserud & Peek, 2014; Robb, Small, & Haley, 2008; Schieman & Plickert, 2007; Yang & George, 2005). Although the association between activity limitations and depression is complex and likely bidirectional (Hybels, Pieper, & Blazer, 2009), there is considerable theoretical grounding and empirical evidence suggesting that limitations in daily activities are an important antecedent of depression among older adults. On a theoretical level, the stress process model holds that not being able to perform daily activities due to physical and cognitive impairments associated with health decline and injury is a disruptive and chronic stressor that compromises one's independence, self-esteem, and ability to perform meaningful social activities, all of which may lead to depression (Bruce, 2001; Pearlin & Skaff, 1996). Activity limitations are also strongly associated with social disengagement, which in turn places individuals at an increased risk of depression (Rosso, Taylor, Tabb, & Michael, 2013). In accordance with this model, earlier studies based on cross-sectional (Robb et al., 2008) and longitudinal designs (He et al., 2019; Monserud & Peek, 2014; Schieman & Plickert, 2007; Yang & George, 2005) consistently find that activity limitations are associated with depression.

The Couple Context of Activity Limitations

What is widely acknowledged in the research literature is the need to investigate dyadic associations between activity limitations and depression among older coupled-individuals (He et al., 2019; Hoppmann, Gerstorf, & Hibbert, 2011; Monserud & Peek, 2014; Robb et al., 2008). The emphasis on couples is in large part driven by the fact that the lives of coupled-individuals (i.e., married persons and those in otherwise similar coupled-relationships) are typically linked, especially for older couples with a long partnership history (Hoppmann & Gerstorf, 2014). Such interdependence is especially relevant in terms of the evidence regarding health concordance among couples (e.g., depressive symptoms; Meyler, Stimpson, & Peek, 2007). The interdependence may also be extended to the care implications associated with health declines among one or both of the coupled-individuals (Freedman & Spillman, 2014). Accordingly, there is an increasing body of evidence linking the activity limitations of one spouse with depression of the

other spouse in the dyad (He et al., 2019; Hoppmann et al., 2011; Monserud & Peek, 2014; Robb et al., 2008). Importantly, spouses/partners of individuals with ADL limitations often assume a caregiver role, which is widely considered to have implications for their mental health (Pinquart & Sörensen, 2011). Further, spousal care is by definition a dyadic process with health implications for both spouses, either as a provider or as a recipient of care.

The Moderating Role of Spousal Caregiving and Care Receipt

Role of Caregiving

Decades of research focused on health outcomes associated with being on the giving end of the spousal care dynamic (Roth, Fredman, & Haley, 2015). Often framed within a stress process perspective (Pearlin & Skaff, 1996), earlier studies acknowledged caregiving as a chronic stressor and typically found that assuming the role of caregiver was associated with adverse mental health outcomes, including depression, especially for female caregivers (Pinquart & Sörensen, 2006; Schulz & Beach, 1999). Given that activity limitations of the self and the spouse are also considered chronic stressors, it is plausible that the distressing effects of one's own and spouse's activity limitations may be further aggravated by caregiver burden and stress, leading to worse mental health outcomes.

However, recent studies on the topic demonstrated that caregiving can lead to divergent outcomes for the caregiver, increasingly showing how caregiving may also enhance well-being (Freedman, Cornman, & Carr, 2014) and reduce mortality risk of the caregiver depending on contextual factors (for a review, see Roth et al., 2015). Researchers suggested that the adverse health outcomes associated with caregiving is at least partly attributable to selection processes underlying the caregiver role, and that health differences between caregivers and noncaregivers diminish when selection effects are taken into consideration (Roth et al., 2015). In accordance with this view, a study by Poulin and colleagues (2010) demonstrated that within-person associations between number of caregiving hours and affective well-being among spousal caregivers varied significantly, depending on the between-person differences in the relationship quality spousal caregivers had with the care-receiving spouse. They found that caregiving behavior was associated with more positive affect, but not with negative affect, for caregivers who reported having an interdependent spousal relationship (Poulin et al., 2010). As such, providing needed care to a loved one may serve as protective factor in the context of the disablement process, as found with regards to other forms of helping behavior (e.g., volunteering; Kail & Carr, 2016). Based on these findings, we designed a study based on a within-person analytic approach for estimating the potential health effects of caregiving (as well as care-recipient) status.

Role of Receiving Care

The literature on health outcomes associated with being on the receiving end of spousal care also paints a complex picture. While researchers generally agreed that having social capital in the form of *perceived* social support is beneficial for health, actual receipt of help in the form of instrumental support in the context of activity limitations may lead to both beneficial (Chan, Anstey, Windsor, & Luszcz, 2011) and detrimental outcomes (Kim et al., 2017; Reinhardt, Boerner, & Horowitz, 2006). Earlier studies often did not specifically focus on spousal support or were based on measures that aggregated support across multiple kin and non-kin sources. As such, it was unclear whether and how *received* spousal care may moderate the link between activity limitations and health outcomes like depression. However, findings from a recent study by Carr and colleagues (2017) provided evidence suggestive of differential effects for women and men; that is, perceived spousal support was found to attenuate the association between activity limitations and negative emotions for women, whereas perceived spousal support enhanced the association for men. One potential explanation for these gendered effects is that spousal support in the context of disability can undermine sense of autonomy and independence among men, thereby leading to worse outcomes (Carr et al., 2017).

Study Objectives

This study aimed to contribute to the literature on activity limitations and depression among couples by focusing on the moderating role of spousal care, using longitudinal household data from the *Health and Retirement Study*. We applied a within-person analytic approach to address research questions regarding the association between activity limitations and depressive symptoms among coupled individuals. These questions included: (1a) Are activity limitations associated with depressive symptoms over time? and (1b) Are there cross-spousal associations between activity limitations and depressive symptoms? We expected that activity limitations of the self and the spouse would be associated with more depressive symptoms.

We also addressed research questions regarding whether the association between *one's own* activity limitations and depressive symptoms was moderated by receipt and provision of spousal care. The moderating role of spousal care was addressed with the questions: (2a) Is the association between activity limitations and depressive symptoms moderated by *receipt* of spousal care? and (2b) Is the association moderated by *provision* of spousal care?

Finally, the moderating role of spousal care for the link between *spouse's* activity limitations and depressive symptoms was addressed with the following research questions: (3a) Is the association between spouse's activity limitations and depressive symptoms moderated by *receipt* of spousal care? and (3b) Is the association moderated by *provision*

of spousal care? Given the lack of clear directionality for these relationships in the scientific literature, no hypotheses are offered for the four research questions addressing the moderating role of spousal care for the linkages between activity limitations and depression among couples.

Methods

Data Source and Study Sample

This study was based on data from the *Health and Retirement Study* (HRS), a large, longitudinal panel study of over 7,000 households in the United States (Sonnegg et al., 2014). Data for this project were taken primarily from the RAND constructed data file that accounted for missing information and inconsistencies across waves (Bugliari et al., 2016). Measures taken from the RAND file included ADL limitations, depressive symptoms, labor force status, household income and wealth, and number of family members in the household. Variables not part of the RAND file were taken from the core public-use files provided by the Survey Research Center at the University of Michigan.

We used six waves of biennial data from 2004 to 2014; information regarding key variables was not available prior to the 2004 wave. The study sample consisted of pairs of individuals who met the following criteria: (a) respondents were married to the same spouse during the waves in which they participated; a small number of same-sex couples were excluded due to our focus on gender-specific influences; (b) couples were observed for at least two waves; and (c) both spouses participated in the HRS as a non-proxy respondent and provided complete information for all study variables at a given wave (only about 1% of the person-wave observations had missing information). Couples were entered into the study sample at any point during the 10-year observation when they met these criteria; as such, "baseline" in this study refers to the first wave in which the couples were observed during the study period. The criteria yielded a sample size of 6,614 couples, equivalent to about 75% of all coupled individuals who participated in the HRS from 2004 to 2014. During the observation period, approximately 16% of the couples (dyad $n = 1,042$) in the sample experienced a death of a spouse and an additional 8% (dyad $n = 509$) experienced a marital dissolution (e.g., divorce, separation). Respondents were excluded from the sample from the wave when a death (of a partner) or a marital dissolution was observed; that is, the couples were retained in the sample only during the waves when both spouses were observed. The analyses were based on 52,706 person-wave observations collected from the 6,614 couples.

Measures

Depressive symptoms

Depressive symptoms were assessed with an eight-item version of the Center for Epidemiological Studies-Depression

(CES-D), a well-validated measure for assessing depressive symptoms in both clinical and nonclinical samples (Steffick, 2000). At each wave, respondents were asked whether the following statements were true for them much of the time during the past week: (a) was depressed, (b) everything was an effort, (c) sleep was restless, (d) was happy, (e) felt lonely, (f) enjoyed life, (g) felt sad, and (h) could not get going. Two positive items (d and f) were first reverse-coded and then the responses for the eight items (1 = yes; 0 = no) were summed, with higher scores indicating more depressive symptoms (range: 0–8).

Activity limitations

At each wave, respondents were asked whether they had any difficulty with the following six ADL items: (a) walking across a room, (b) dressing, (c) bathing, (d) eating, (e) getting in and out of bed, and (f) toileting. Responses for the six items (1 = yes; 0 = no) were summed, with higher scores indicating more activity limitations (range: 0–6). The HRS also included items regarding limitations with instrumental activities of daily living (IADL). We focused on ADL limitations because they capture limitations that are more crucial to day-to-day functioning and a sense of independence compared to IADL problems, and also because ADL limitations often require hands-on personal assistance, whereas IADL limitations often do not require personal assistance (Wolf, 2015).

Receipt and provision of spousal care

If respondents reported having difficulty with any ADL task, they were further asked whether they received help from anyone, and if so, they were asked to list the people from whom they received help. Because receipt of spousal assistance was contingent on respondent's ADL limitations, *care-recipient status* at each wave was coded with a three-category measure (1 = *did not receive ADL assistance* (reference), 2 = *received ADL assistance*, 3 = *did not need ADL assistance*). Further, *caregiver status* was determined by using care-recipient status information of the spouse at each wave; that is, based on whether the spouse reported having received care at a given wave, the respondent was coded with a three-category measure (1 = *did not give ADL assistance* (reference), 2 = *gave ADL assistance*, 3 = *spouse did not need ADL assistance*).

We also performed sensitivity analyses based on a dichotomous version of the care-recipient status (1 = *received ADL assistance*, 0 = *did not receive/need ADL assistance*) and the caregiver status measures (1 = *gave ADL assistance*, 0 = *did not give/spouse did not need ADL assistance*); findings from the sensitivity analyses are presented in [Supplementary Table 1](#). We presented results from the models based on the three-category ADL measure to maintain the distinction between respondents who did not receive/give (needed) ADL assistance from those who (or whose spouse) did not need help, especially with regard to the moderation effects of spousal care regarding the linkages between ADL limitations and depressive symptoms.

Control variables

We considered both time-invariant covariates (TIC) and time-varying covariates (TVC) measured at the individual and couple levels that may confound the relationships between ADL limitations, spousal care, and depressive symptoms. Individual-level TICs included age at baseline, race-ethnic status (*non-Hispanic White* (reference), *non-Hispanic Black*, *non-Hispanic other race*, and *Hispanic*), and education measured as number of years of completed school (range: 0–17). Couple-level TICs included marital status (1 = *married*; 0 = *nonmarital cohabitation*) and duration of current marriage (in years) at baseline. Individual-level TVCs included labor force status (1 = *working for pay*; 0 = *not*) and whether spouse had any doctor-diagnosed memory-related disease (1 = *yes*; 0 = *no*). Couple-level TVCs included household income transformed by the natural log, household wealth transformed by the inverse hyperbolic sine function (Friedline, Masa, & Chowa, 2015), number of persons living in the household, and number of children living within 10 miles (range: 0–4+).

Analytic Strategy

We estimated a series of within-between random effects models (WBRE; Bell & Jones, 2015) that were incorporated within the actor-partner interdependence model framework (APIM; Cook & Kenny, 2005). WBRE approach was utilized to examine within-person associations between independent and dependent variables by decomposing effects of a time-varying predictor into between-person (level 2) and within-person (level 1) components. A WBRE model allows the two components to be estimated separately: person-mean for each time-varying predictor is included as a between-person component of the predictor and the within-person component is the deviation from this person-mean at a given occasion, so that within-person estimates are independent of selection effects attributed to all stable interindividual differences, both observed and unobserved. This approach is mathematically equivalent with an alternative parameterization approach that includes the person-mean value of each time-varying predictor without the person-mean subtraction, regardless of whether the predictor is continuous or categorical (i.e., Mundlak formulation; Bell & Jones, 2015). Given that the two techniques yield identical estimates for level-1 measures, we employed the WBRE approach to be consistent in our treatment of continuous and categorical predictors.

The WBRE models were incorporated in the actor-partner interdependence model (APIM) framework to examine individuals nested within couples over time (Cook & Kenny, 2005). The APIM approach allowed for estimation of the unique effects of one's own (i.e., actor) and spouse's (i.e., partner) activity limitations and spousal care simultaneously, while accounting for within-couple interdependency in depressive symptoms.

We first estimated an unadjusted model for depressive symptom trajectories; specifically, the dual-intercept model estimated separate trajectories for wives and husbands (see supplementary material for a presentation of the unadjusted model). We then added to the unadjusted model the key measures of activity limitations and spousal care along with all study variables, where all time-varying measures were decomposed into within- and between-components. The research questions (1a and 1b) concerning actor and partner effects of activity limitations on depressive symptoms were addressed by examining the significance of the within-person measures for activity limitations of the self and the spouse, respectively (Model 1). The research questions (2a and 2b, 3a and 3b) regarding the moderating role of spousal care were addressed by introducing interaction terms between measures of activity limitations and spousal care (Model 2). The interaction terms were also decomposed into within- and between-components so that interaction effects were not biased by stable omitted characteristics (Schunck, 2013). Although we did not offer any hypotheses regarding gender differences, we explored whether the linkages between activity limitations, spousal care, and depressive symptoms were different for wives and husbands, based on an alternative parameterization of the one-intercept model used to formally test gender differences in the APIM framework (Kashy & Donnellan, 2012). All analyses were performed using SAS (PROC MIXED; Version 9.4).

Results

Study Sample Characteristics

Study sample characteristics are presented in Table 1. Wives and husbands reported a low average number of ADL limitations at baseline (mean ≈ 0.2). Most spouses (89%) in the sample did not need ADL assistance at baseline and only about 4% of spouses reported receiving (or giving) spousal ADL assistance. Over the course of the study period, however, more than 26% of both wives and husbands reported having at least one ADL limitation, resulting in over 12% of both spouses experiencing receipt (and provision) of spousal ADL assistance (not shown in table).

Multilevel Model Results

Main effects model

The research questions pertaining to the main effects of ADL limitations, as well as receipt and provision of spousal care, for depressive symptoms are addressed in Model 1 (Table 2; for complete model results, see Supplementary Table 2). For both wives ($b = 0.29, p < .001$) and husbands ($b = 0.25, p < .001$), own ADL limitations were associated with more depressive symptoms. Further, spousal ADL limitations were associated with wives' depressive symptoms ($b = 0.07, p < .01$), but not husbands' depression symptoms;

that is, as husbands' number of ADL limitations increased, wives' depressive symptoms increased as well. As for spousal care, wives' depressive symptoms were unrelated to either care-recipient or caregiver status. For husbands, however, receiving spousal ADL assistance was associated with more depressive symptoms ($b = 0.16, p < .01$), compared to not receiving assistance; husbands' caregiver status was not associated with depressive symptoms.

Despite the pattern of results suggestive of gender differences in the main effects model, formal tests of gender differences regarding the (actor and partner) effects of activity limitations as well as spousal care (receipt and provision) were not significant (not shown in table).

Interaction effects model

The research questions pertaining to whether the associations between ADL limitations and depressive symptoms varied depending on care-recipient/caregiver status were addressed in Model 2 (Table 2; for complete model results, see Supplementary Table 2). Findings from the interaction effects model indicated that the association between one's own ADL limitations and depressive symptoms was moderated by *care-recipient status* for both spouses—although in different directions for wives and husbands. For wives, the association between own ADL limitations and depressive symptoms was attenuated when wives received assistance from husbands ($b = -0.09, p < .05$), compared to when they did not receive such assistance. For husbands, however, the association became more pronounced when they received assistance from wives ($b = 0.09, p < .05$), compared to when they did not receive such assistance; that is, husbands' own ADL limitations had a more detrimental effect with respect to their depressive symptoms when their wives provided caregiving (compared to when wives did not; see Figure 1). Additionally, the association between own ADL limitations and depressive symptoms was further moderated by *caregiver status* for husbands ($b = 0.12, p < .05$), but not wives; that is, husbands' own ADL limitations had a more detrimental effect for their depressive symptoms when they provided assistance to their wives, compared to when they did not.

The association between spousal ADL limitations and depressive symptoms was also moderated by *care-recipient status* for both wives ($b = -0.21, p < .001$) and husbands ($b = -0.10, p < .05$). Specifically, the detrimental effects of husbands' ADL limitations on wives' depressive symptoms became reversed when the husband, who himself had ADL limitations, provided ADL assistance to wives (a weaker but similar pattern of results for husbands; see Figure 2). However, *caregiver status* did not moderate the link between spousal ADL limitations and depressive symptoms for both wives and husbands.

Finally, formal tests for gender differences indicated that the moderating effects of receipt of spousal care on the link between actor effects of activity limitations and depressive symptoms were significantly different for wives and

Table 1. Descriptive Characteristics of the Study Sample at Baseline

Variables	Wives		Husbands	
	M	(SD)	M	(SD)
Depressive symptoms ^a	1.40	(1.97)	1.05	(1.63)
ADL limitations ^b	0.22	(0.75)	0.20	(0.70)
Spousal care				
<i>Care-recipient status, %</i>				
Did not receive ADL assistance	6.89		6.46	
Received ADL assistance	4.45		4.17	
Did not need ADL assistance	88.66		89.37	
<i>Caregiver status, %</i>				
Did not give ADL assistance	6.46		6.89	
Gave ADL assistance	4.17		4.45	
Spouse did not need ADL assistance	89.37		88.66	
Individual-level characteristics				
Age (in years)	60.48	(9.82)	63.69	(9.69)
<i>Race-ethnic status, %</i>				
White (non-Hispanic)	71.58		71.76	
Black (non-Hispanic)	12.17		12.59	
Other race (non-Hispanic)	3.07		2.98	
Hispanic (any race)	13.18		12.67	
Educational attainment (in years)	12.76	(3.01)	12.77	(3.40)
Working for pay, %	46.98		54.20	
Having any memory-related disease, %	1.27		1.78	
Couple-level characteristics				
Married ^c , %	93.97			
Duration of current marriage (in years)	31.84	(15.96)		
Household income (log-transformed)	10.81	(1.30)		
Median value (in \$1,000)	54.55			
Household wealth (IHS-transformed)	5.24	(2.60)		
Median value (in \$1,000)	170.85			
Number of people in household	2.66	(1.17)		
Number of children living within 10 miles	0.80	(1.05)		
Number of waves used in study	3.99	(1.71)		

Note: Dyad N = 6,614. ADL = activities of daily living; IHS = inverse hyperbole sine.

^aCount of eight items from the Center for Epidemiological Studies-Depression Scale (CES-D). ^bCount of six ADL limitations. ^c1 = married and 0 = nonmarital cohabitation.

husbands ($p < .01$); significant gender differences were not found for the other interaction effects (not shown in table).

Discussion

The objective of this study was to contribute to the literature on activity limitations and depressive symptoms among coupled-individuals, focusing on the moderating roles of receipt and provision of spousal care. Our findings highlighted that receipt and provision of ADL-related assistance may contextualize the effects of activity limitations on depressive symptoms among coupled-individuals, in a direction that could alleviate or aggravate the risk of depression.

Activity Limitations and Depressive Symptoms

Our findings corroborated the robust link between one's own activity limitations and depression widely reported in

the literature (He et al., 2019; Monserud & Peek, 2014). However, the link between spousal activity limitations and depressive symptoms found in several earlier studies was only significant for wives, but not husbands, in this study (He et al., 2019; Hoppmann et al., 2011; Monserud & Peek, 2014; Robb et al., 2008). The discrepant findings between our research and those of other researchers may be in part attributable to the differences in research design. Our findings demonstrated the within-person linkages between activity limitations and depressive symptoms, whereas earlier studies largely focused on between-person associations. That is, the within-person estimates for activity limitations were adjusted for any differences in depressive symptoms observed between persons who had more activity limitations compared to those who had fewer limitations during the study period (similar to spousal activity limitations; see [Supplementary Table 2](#)). Unlike earlier studies, we also explicitly accounted for the potential confounding effects

Table 2. ADL Limitations, Spousal Care, and Depressive Symptoms Among Older Couples

Variables	Model 1: Main effects				Model 2: Interaction effects			
	Wives		Husbands		Wives		Husbands	
	Estimate	(SE)	Estimate	(SE)	Estimate	(SE)	Estimate	(SE)
Fixed effects								
Own ADL limitations	0.29***	(0.02)	0.25***	(0.02)	0.38***	(0.05)	0.18***	(0.04)
× Care-recipient status (ref: did not receive assistance)								
Received assistance	—	—	—	—	−0.09*	(0.05)	0.09*	(0.04)
× Caregiver status (ref: did not give assistance)								
Gave spousal assistance	—	—	—	—	0.03	(0.06)	0.12*	(0.05)
Spouse did not need assistance	—	—	—	—	−0.05	(0.04)	0.00	(0.04)
Spousal ADL limitations	0.07**	(0.03)	0.03	(0.02)	0.04	(0.05)	0.05	(0.04)
× Care recipient status (ref: did not receive assistance)								
Received assistance	—	—	—	—	−0.21***	(0.06)	−0.10*	(0.05)
Did not need assistance	—	—	—	—	0.05	(0.04)	−0.05	(0.04)
× Caregiver status (ref: did not give assistance)								
Gave spousal assistance	—	—	—	—	0.01	(0.05)	0.04	(0.04)
Spousal care								
Care-recipient status (ref: did not receive assistance)								
Received assistance	0.02	(0.06)	0.16**	(0.05)	0.27*	(0.11)	0.04	(0.09)
Did not need assistance	−0.05	(0.05)	−0.13**	(0.04)	0.01	(0.07)	−0.18**	(0.06)
Caregiver status (ref: did not give assistance)								
Gave spousal assistance	0.03	(0.07)	−0.06	(0.05)	−0.01	(0.11)	−0.16	(0.09)
Spouse did not need assistance	0.04	(0.05)	−0.03	(0.04)	0.04	(0.07)	−0.06	(0.06)
Random effects								
Intercept variance	1.35***	(0.03)	1.03***	(0.02)	1.34***	(0.03)	1.03***	(0.02)
Time variance	0.03***	(0.00)	0.02***	(0.00)	0.03***	(0.00)	0.02***	(0.00)
Residual variance	1.09***	(0.01)	1.55***	(0.02)	1.09***	(0.01)	1.55***	(0.02)
−2 log-likelihood		184,668.5				184,687.2		
AIC		184,694.5				184,713.2		

Note: Dyad $N = 6,614$; Person-wave observation $N = 52,706$. ADL = activities of daily living. All estimates for fixed effects in the table represent within-person (level-1) effects; models are fully adjusted for all covariates; full model results are presented in [Supplementary Table 2](#).

* $p < .05$; ** $p < .01$; *** $p < .001$.

of caregiving behavior in the link between spousal activity limitations and depressive symptoms.

Taking these methodological details into consideration, the lack of a significant association between wives' activity limitations and husbands' depressive symptoms was in line with findings from the broader literature, which often demonstrated that husbands' health deterioration was associated with wives' depressive symptoms, but not vice versa (Ayotte, Yang, & Jones, 2010; Valle, Weeks, Taylor, & Eberstein, 2013). Such gender differences are often explained by the psychological distress associated with women's traditional role as family health caretaker (Read & Grundy, 2011). Relatedly, it may also be that family health problems, including spousal health, are more likely to contribute to a dismal view of the future among women but not necessarily men (Kim, Kim,

Boerner, & Han, 2018), and that grief and anxiety associated with family health problems is more likely to be internalized by women and negatively influence their mental health. These problems tend to be externalized by men, negatively influencing physical health (Valle et al., 2013).

The Moderating Role of Spousal Care

The key finding of this study was that receipt of spousal care significantly moderated the link between ones' own activity limitations and depressive symptoms. More importantly, our findings underscored the gendered nature of the moderating effects of spousal care; that is, receipt of spousal care weakened the positive link between activity limitations and depressive symptoms for wives, but it made the link more

Figure 1. Predicted number of depressive symptoms (and 95% confidence interval) by care-recipient status for varying numbers of one's own activity limitations, holding the effects of covariates constant (1A: wives; 1B: husbands). The plots are based on estimated parameters from Model 2.

pronounced for husbands. This result is consistent with findings from a recent study that examined the moderating effects of spousal support on disability and activity-related negative emotion that also reported contrasting effects of spousal support for wives and husbands (Carr et al., 2017). The stress process model provides a useful conceptual framework for interpreting these findings. While *perceived* social support, in general, is regarded as a coping resource for stressors related to disability (Pearlin & Skaff, 1996), research increasingly demonstrates that *received* support can be a source of distress (Reinhardt et al., 2006). This may be especially the case for men, for whom receipt of spousal care and assistance can lead to a compromised sense of independence and competency, subsequently increasing psychological distress for the care-recipient (Thoits, 2011). In accordance with this view, an earlier study found that supportive behaviors demonstrated by spouses (e.g., providing help with something important, listening or comforting behavior) were associated with adverse physiological stress-reactivity

Figure 2. Predicted number of depressive symptoms (and 95% confidence interval) by care-recipient status for varying numbers of spousal activity limitations, holding the effects of covariates constant (1A: wives; 1B: husbands). The plots are based on estimated parameters from Model 2.

for husbands, whereas wives benefitted from spousal support (Crockett & Neff, 2013).

For husbands only, providing spousal care in the context of one's own activity limitations was associated with more depressive symptoms. The caregiving literature indicates that caregivers' preexisting health conditions were among the important factors that increase caregivers' vulnerability to stress (Roth et al., 2015). Given that men are typically less effective providers of direct support compared to women (Taylor, 2011), such ineffectiveness in providing care may have served as an additional source of distress for husbands who were already suffering from their own activity limitations. However, this was the only instance where caregiving behavior was associated with depressive symptoms in this study. The findings that caregiving was not independently associated with depressive symptoms, nor did it interact with spousal activity limitations (i.e., spousal ADL limitations $\times$ caregiver status) to heighten the risk of depression, were consistent with the emerging view

that caregiving does not necessarily lead to worse mental health when relevant factors are included in research designs (Poulin et al., 2010; Roth et al., 2015).

In contrast, we found that the relationship between spousal activity limitations and depressive symptoms was moderated by receipt of spousal care for both wives and husbands, such that depressive symptoms associated with spousal limitations were largely offset (in fact, the association appeared to be reversed for wives) when the partner with activity limitations could provide assistance to her or himself. This finding offered evidence about how spousal disability may influence psychological well-being in later life. As discussed earlier, having a spouse in poor health may yield a dismal view of the future, in part because a disabled spouse was less likely to be able to provide needed help and assistance in the future (Kim et al., 2018). In contrast, when the spouse with activity limitations demonstrates resilience and the ability to be a helpful resource by providing ADL-related assistance, such concerns may be eliminated and potentially contribute to psychological well-being. More research is needed here.

Limitations

Despite our within-person analytic approach, it was not possible to discuss the empirical findings in causal terms not only because we were unable to determine the temporal order between activity limitation onset and depressive symptoms, but also because of the potential bias implicated by time-varying omitted variables. Because the study was based on a nonclinical measures, clinical ramifications of our findings are unclear. Further, the potential mechanisms underlying the relationships between the key variables were not addressed in the study, in part due to data limitations.

Conclusions

This was the first study based on longitudinal data from a large national sample of coupled-individuals to estimate within-person associations of activity limitations, spousal care, and depressive symptoms. Further, the within-person analytic approach partially addresses the social selection issues that undermined confidence in findings from earlier studies. Our findings underscored the need for practitioners and policy makers to conceptualize disability as a family-level phenomenon that has health implications for not only the persons with the disability, but also for significant others. Intervention efforts directed at enhancing older couples' ability to not only provide effective care in the context of disability, but also to receive support when necessary, may benefit the health of both spouses, especially for men.

Supplementary Material

Supplementary data is available at *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences* online.

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Conflict of Interest

None reported.

References

- Ayotte, B. J., Yang, F. M., & Jones, R. N. (2010). Physical health and depression: A dyadic study of chronic health conditions and depressive symptomatology in older adult couples. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, 65, 438–448. doi:10.1093/geronb/gbq033
- Bell, A., & Jones, K. (2015). Explaining fixed effects: Random effects modeling of time-series cross-sectional and panel data. *Political Science Research and Methods*, 3, 133–153. doi:10.1017/psrm.2014.7
- Bruce, M. L. (2001). Depression and disability in late life: Directions for future research. *The American Journal of Geriatric Psychiatry*, 9, 102–112. doi:10.1097/00019442-200105000-00003
- Bugliari, D., Campbell, N., Chan, C., Hayden, O., Hurd, M., Main, R., ... St.Clair, P. (2016). *Rand HRS data documentation, version p*. Santa Monica, CA: RAND Center for the Study of Aging.
- Carr, D., Cornman, J. C., & Freedman, V. A. (2017). Disability and activity-related emotion in later life: Are effects buffered by intimate relationship support and strain? *Journal of Health and Social Behavior*, 58, 387–403. doi:10.1177/0022146517713551
- Chan, N., Anstey, K. J., Windsor, T. D., & Luszcz, M. A. (2011). Disability and depressive symptoms in later life: The stress-buffering role of informal and formal support. *Gerontology*, 57, 180–189. doi:10.1159/000314158
- Cook, W. L., & Kenny, D. A. (2005). The actor-partner interdependence model: A model of bidirectional effects in developmental studies. *International Journal of Behavioral Development*, 29, 101–109. doi:10.1080/01650250440000405
- Crockett, E. E., & Neff, L. A. (2013). When receiving help hurts: Gender differences in diurnal cortisol responses to spousal support. *Social Psychological and Personality Science*, 4, 190–197. doi:10.1177/1948550612451621
- Freedman, V. A., Cornman, J. C., & Carr, D. (2014). Is spousal caregiving associated with enhanced well-being? New evidence from the panel study of income dynamics. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, 69, 861–869. doi:10.1093/geronb/gbu004
- Freedman, V. A., & Spillman, B. C. (2014). Disability and care needs among older Americans. *The Milbank Quarterly*, 92, 509–541. doi:10.1111/1468-0009.12076
- Friedline, T., Masa, R. D., & Chowa, G. A. (2015). Transforming wealth: Using the inverse hyperbolic sine (IHS) and splines to predict youth's math achievement. *Social Science Research*, 49, 264–287. doi:10.1016/j.ssresearch.2014.08.018

- He, M., Ma, J., Ren, Z., Zhou, G., Gong, P., Liu, M., ... Zhang, X. (2019). Association between activities of daily living disability and depression symptoms of middle-aged and older Chinese adults and their spouses: A community based study. *Journal of Affective Disorders*, 242, 135–142. doi:10.1016/j.jad.2018.08.060
- Hennessy, S., Kurichi, J. E., Pan, Q., Streim, J. E., Bogner, H. R., Xie, D., & Stineman, M. G. (2015). Disability stage is an independent risk factor for mortality in Medicare beneficiaries aged 65 years and older. *PM & R*, 7, 1215–1225. doi:10.1016/j.pmrj.2015.05.014
- Hoppmann, C. A., & Gerstorf, D. (2014). Biobehavioral pathways underlying spousal health dynamics: Its nature, correlates, and consequences. *Gerontology*, 60, 458–465. doi:10.1159/000357671
- Hoppmann, C. A., Gerstorf, D., & Hibbert, A. (2011). Spousal associations between functional limitation and depressive symptom trajectories: Longitudinal findings from the study of Asset and Health Dynamics Among the Oldest Old (AHEAD). *Health Psychology*, 30, 153–162. doi:10.1037/a0022094
- Hybels, C. F., Pieper, C. F., & Blazer, D. G. (2009). The complex relationship between depressive symptoms and functional limitations in community-dwelling older adults: The impact of subthreshold depression. *Psychological Medicine*, 39, 1677–1688. doi:10.1017/S0033291709005650
- Kail, B. L., & Carr, D. C. (2016). Successful aging in the context of the disablement process: Working and volunteering as moderators on the association between chronic conditions and subsequent functional limitations. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, 72, 340–350. doi:10.1093/geronb/gbw060
- Kashy, D. A., & Donnellan, M. B. (2012). Conceptual and methodological issues in the analysis of data from dyads and groups. In K. Deaux & M. Snyder (Eds.), *The Oxford handbook of personality and social psychology*. New York: Oxford University Press. doi:10.1093/oxfordhb/9780195398991.013.0009
- Kim, K., Bangerter, L. R., Liu, Y., Polenick, C. A., Zarit, S. H., & Fingerman, K. L. (2017). Middle-aged offspring's support to aging parents with emerging disability. *The Gerontologist*, 57, 441–450. doi:10.1093/geront/gnv686
- Kim, Y., Kim, K., Boerner, K., & Han, G. (2018). Aging together: Self-perceptions of aging and family experiences among Korean baby boomer couples. *The Gerontologist*, 58, 1044–1053. doi:10.1093/geront/gnx132
- Meyler, D., Stimpson, J. P., & Peek, M. K. (2007). Health concordance within couples: A systematic review. *Social Science & Medicine*, 64, 2297–2310. doi:10.1016/j.socscimed.2007.02.007
- Monserud, M. A., & Peek, M. K. (2014). Functional limitations and depressive symptoms: A longitudinal analysis of older Mexican American couples. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, 69, 743–762. doi:10.1093/geronb/gbu039
- Pearlin, L. I., & Skaff, M. M. (1996). Stress and the life course: A paradigmatic alliance. *The Gerontologist*, 36, 239–247. doi:10.1093/geront/36.2.239
- Pinquart, M., & Sörensen, S. (2006). Gender differences in caregiver stressors, social resources, and health: An updated meta-analysis. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, 61, P33–P45. doi:10.1093/geronb/61.1.p33
- Pinquart, M., & Sörensen, S. (2011). Spouses, adult children, and children-in-law as caregivers of older adults: A meta-analytic comparison. *Psychology and Aging*, 26, 1–14. doi:10.1037/a0021863
- Poulin, M. J., Brown, S. L., Ubel, P. A., Smith, D. M., Jankovic, A., & Langa, K. M. (2010). Does a helping hand mean a heavy heart? Helping behavior and well-being among spouse caregivers. *Psychology and Aging*, 25, 108–117. doi:10.1037/a0018064
- Read, S., & Grundy, E. (2011). Mental health among older married couples: The role of gender and family life. *Social Psychiatry and Psychiatric Epidemiology*, 46, 331–341. doi:10.1007/s00127-010-0205-3
- Reinhardt, J. P., Boerner, K., & Horowitz, A. (2006). Good to have but not to use: Differential impact of perceived and received support on well-being. *Journal of Social and Personal Relationships*, 23, 117–129. doi:10.1177/0265407506060182
- Robb, C., Small, B., & Haley, W. E. (2008). Gender differences in coping with functional disability in older married couples: The role of personality and social resources. *Aging and Mental Health*, 12, 423–433. doi:10.1080/13607860802224326
- Rosso, A. L., Taylor, J. A., Tabb, L. P., & Michael, Y. L. (2013). Mobility, disability, and social engagement in older adults. *Journal of Aging and Health*, 25, 617–637. doi:10.1177/0898264313482489
- Roth, D. L., Fredman, L., & Haley, W. E. (2015). Informal caregiving and its impact on health: A reappraisal from population-based studies. *The Gerontologist*, 55, 309–319. doi:10.1093/geront/gnu177
- Schieman, S., & Plickert, G. (2007). Functional limitations and changes in levels of depression among older adults: A multiple-hierarchy stratification perspective. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, 62, S36–S42. doi:10.1093/geronb/62.1.s36
- Schulz, R., & Beach, S. R. (1999). Caregiving as a risk factor for mortality: The Caregiver Health Effects Study. *JAMA*, 282, 2215–2219. doi:10.1001/jama.282.23.2215
- Schunck, R. (2013). Within and between estimates in random-effects models: Advantages and drawbacks of correlated random effects and hybrid model. *The Stata Journal*, 13, 65–76.
- Sonnega, A., Faul, J. D., Ofstedal, M. B., Langa, K. M., Phillips, J. W., & Weir, D. R. (2014). Cohort profile: The Health and Retirement Study (HRS). *International Journal of Epidemiology*, 43, 576–585. doi:10.1093/ije/dyu067
- Steffick, D. E. (2000). *Documentation of affective functioning measures in the Health and Retirement Study*. Ann Arbor, MI: Institute for Social Research, University of Michigan. Retrieved from <https://hrs.isr.umich.edu/publications/biblio/5411>
- Taylor, S. E. (2011). Social support: A review. In H. S. Friedman (Ed.), *The handbook of health psychology* (pp. 189–214). New York: Oxford University Press.
- Thoits, P. A. (2011). Mechanisms linking social ties and support to physical and mental health. *Journal of Health and Social Behavior*, 52, 145–161. doi:10.1177/0022146510395592
- Valle, G., Weeks, J. A., Taylor, M. G., & Eberstein, I. W. (2013). Mental and physical health consequences of spousal health shocks among older adults. *Journal of Aging and Health*, 25, 1121–1142. doi:10.1177/0898264313494800
- Wolf, D. (2015). Late-life disability trends and trajectories. In L. K. George & K. F. Ferraro (Eds.), *Handbook of aging and the social sciences* (8th ed., pp. 77–99). New York: Academic Press. doi:10.1016/B978-0-12-417235-7.00004-4
- Yang, Y., & George, L. K. (2005). Functional disability, disability transitions, and depressive symptoms in late life. *Journal of Aging and Health*, 17, 263–292. doi:10.1177/0898264305276295