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Original Article

Do Older Parents' Relationships With Their Adult Children Affect Cognitive Limitations, and Does This Differ for Mothers and Fathers?

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Abstract

Objectives: Increasing risk for cognitive limitations in later life, along with an aging population, presents critical challenges for caregiving families and health care systems. These challenges urgently call for research examining factors that may protect against or exacerbate cognitive limitations among older adults. We examine the quality of relationships with adult children, a feature of the social environment known to affect physical and mental health and that may also influence the cognitive health of aging parents.
Methods: Using nationally representative panel data from the Americans' Changing Lives survey, we analyze the impact of both emotional support and strain in relationships with adult children on trajectories of cognitive limitations of aging parents.
Results: Higher levels of strain with adult children were linked to higher initial levels of cognitive limitations among mothers but appeared to be protective against increasing cognitive limitations for fathers as they aged.
Discussion: The gender gap in cognitive limitations may be exacerbated among aging parents experiencing high levels of strain with their adult children. These findings point to the importance of taking gender into account and studying whether positive and negative aspects of close social relationships affect older adults.

Keywords: Adult child–parent relationships—Cognitive health—Gender—Relationship quality

Cognitive limitations, comprising impairment in domains such as memory and orientation, become increasingly likely with age. About 9 million Americans exhibit cognitive limitations (Brookmeyer et al., 2011), and the higher prevalence among older adults, particularly in the context of an aging U.S. population, presents critical challenges for caregiving families and health care systems. Meeting these challenges requires a better understanding of the environmental factors affecting cognitive health for this growing at-risk population. One such factor meriting greater examination is the quality of older adults' social relationships. Although we know that social relationships affect physical health and psychological well-being (Umberson, Pudrovska, & Reczek, 2010), few studies have considered whether the quality of social relationships influences cognitive health in late life. Recent research suggests that the quality of marital relationships influences cognitive limitations in older populations (Xu, Thomas, & Umberson, 2016), raising questions about whether other close relationships might influence the development of cognitive limitations. Parent–child relationships may be particularly important for older adults as social ties in other domains, such as through the workplace, become less central in their lives (Milkie, Bierman, & Schieman, 2008). Most adult children remain

closely involved with their aging parents and play a pivotal role in their social networks (Umberson et al., 2010). Yet past research has not examined whether the positive and negative aspects of relationships between parents and their adult children influence aging parents' cognitive health.

Moreover, research suggests that parent–child relationships affect mothers and fathers differently (Reczek, Thomeer, Lodge, Umberson, & Underhill, 2014). Yet research has not considered the possibility of gender differences in the impact of parent–child relationship quality on aging parents' cognitive health, although previous studies point to the possibility of gender differences. For example, Milkie and colleagues (2008) find that mothers' mental health is more dependent on relationship quality with adult children than is fathers' mental health. This gendered pattern may have implications for cognitive health as well. Stress related to interpersonal relationships may affect women more strongly than men, and women and men tend to deal with stress differently (Rosenfield & Mouzon, 2013), which may lead to gendered responses to strained relationships and, in turn, gender differences in cognitive health.

The present study examines the impact of relationship quality in terms of emotional support with adult children (i.e., children listening to parents and making parents feel loved/cared for) as well as strain (i.e., children being critical or demanding) on the cognitive limitations of older adults and whether this impact varies for mothers and fathers, using nationally representative longitudinal data. Although some studies examine the impact of emotional support on older adults' cognitive limitations (Holtzman et al., 2004), few studies examine the impact of both support and strain, net of each other (e.g., Seeman, Lusignolo, Albert, & Berkman, 2001). Social relationships are not uniformly positive or negative, and prior research suggests that the negative aspects of relationships have stronger effects on health and well-being than do the positive aspects (Rook, 1998). At this point, we do not know whether support or strain with adult children has a stronger independent impact on cognitive limitations, nor whether this pattern varies for men and women. These findings may provide new insights into pathways that reduce or exacerbate cognitive decline in older populations, with potentially important differences by gender.

Background

Social relationships are multidimensional, and one may experience both support and strain within the same relationship. Although there are complexities in the support-health connection such that, for example, unwanted or excessive support may be detrimental (Silverstein, Chen, & Heller, 1996), many studies have established benefits from emotional support (e.g., Umberson & Montez, 2010) and costs from relationship strain for mental and physical health (e.g., Thoits, 2010). There is a dearth of research examining the impact of emotional support and strain on cognitive health specifically, despite the growing prevalence of cognitive limitations within an aging population. We work from a stress and life course framework emphasizing the importance of "linked lives" (Elder, Johnson, & Crosnoe, 2003). Parents remain strongly connected (linked) to their children throughout the life course (Umberson et al., 2010). Emotionally supportive aspects of relationships with children may benefit parents while strained aspects of these relationships can be a source of stress. This framework also emphasizes that relationships and life course experiences are structured by social position including gender (Pearlin, Schieman, Fazio, & Meersman, 2005). Our study is situated in this larger literature and brings attention to adult child–parent relationships as an important feature of the social environment that may contribute to change in cognitive health over time and in potentially different ways for mothers and fathers.

Psychological, physiological, and behavioral pathways influence cognitive limitations (Lee et al., 2010; Wilson et al., 2007), and these are potentially important pathways through which social relationships may influence cognitive decline. It is beyond the scope of the present study to test each of these pathways, but past research provides important reasons to expect that both positive and negative features of relationships with adult children would influence the prevention or development of cognitive limitations for parents.

Emotional support in a broad range of relationships has been linked to better cognitive health among older adults (Seeman et al., 2001). Supportive ties may alleviate psychological distress (often assessed using depressive symptoms), and distress is one potential pathway through which relationship quality may influence cognitive health. Emotional support is related to lower distress whereas strain in relationships is related to higher distress (Sherman, Skrzypek, Bell, Tatum, & Paskett, 2011), and distress, in turn, is associated with increases in cognitive limitations over time (Wilson et al., 2007).

Relationship quality may also influence cognitive limitations through physiological pathways. Strain in social relationships is an important source of stress (Rook, 2014), and stress has long been linked to worse health (e.g., Pearlin, Menaghan, Lieberman, & Mullan, 1981). Relationship strain is associated with hypothalamic-pituitary-adrenal (HPA) axis reactivity, which is related to a variety of poor health conditions (Friedman, Karlamangla, Almeida, & Seeman, 2012). Emotionally supportive social interactions, however, can reduce HPA activity (Carter, 1998), with implications for preventing or slowing cognitive decline. Although high stress levels are related to more cognitive limitations at follow-up (Leng et al., 2013), some studies suggest that moderate levels of stress may protect cognitive health (Yuen et al., 2009). Mild chronic stress, such as that associated with relationship conflict, has been linked to

better cognitive health over time (Comijs, van den Kommer, Minnaar, Penninx, & Deeg, 2011).

Behavioral pathways may also link adult child–parent relationship quality to parents' cognitive health. Healthy habits are often protective whereas risky health behaviors are associated with cognitive decline longitudinally (Lee et al., 2010). Social support is associated with health-promoting behaviors (Cho, Jae, Choo, & Choo, 2014) and may influence parents in ways that encourage parents to take better care of their health (Berkman, Glass, Brissette, & Seeman, 2000). However, parents may engage in unhealthy behaviors as a way of coping with relationship stress (Umberson, Liu, & Reczek, 2008). Significant others, including adult children, may also affect a person's health through regulation of their health behaviors (Reczek et al., 2014; Umberson, 1987). Parents may engage in more health-promoting behaviors due to their children's prodding, with positive consequences for cognitive health.

Social Relationships and Cognitive Limitations

Very little research has been conducted specifically on adult child–parent relationship quality and parents' cognitive limitations; however, prior research on the effects of various types of social relationships on cognitive limitations provides us with important clues. Ertel, Glymour, and Berkman (2008) found that greater contact with a range of social ties (including once a week or more contact with children), was related to slower memory decline (one component of cognitive limitations) over 6 years. Similarly, monthly contact with a larger average number of children, relatives, and friends (combined) was related to fewer cognitive limitations initially and less cognitive decline over time (Barnes, Mendes de Leon, Wilson, Bienias, & Evans, 2004). There are also mixed findings regarding relationship quality with network members (e.g., spouse, children, friends, and relatives combined) and cognitive limitations. Some studies have not found a link between perceptions of emotional support from network members and cognitive decline over time among older adults (Bassuk, Glass, & Berkman, 1999). However, Gow, Corley, Starr, and Deary (2013) found that greater social support from network members was related to better cognitive performance cross-sectionally. Seeman's research team (2001) found that both greater emotional supports from spouse, children, friends, and relatives (combined) as well as greater conflict with these network members were positively associated with cognitive health at baseline, but only emotional support was positively associated with cognitive health longitudinally. Studies from other countries provide clues about the impact of adult child–parent relationships specifically. For example, unsatisfying contact with children was related to greater risk for dementia at a 3-year follow up of Swedish older adults (Fratiglioni, Wang, Ericsson, Maytan, & Winblad, 2000). Engagement with adult children (e.g., helping children, feeling useful, playing an important role in their lives) was associated with lower likelihood of severe cognitive decline at follow up among older Spanish men but was not significant among women (Zunzunegui, Alvarado, Del Ser, & Otero, 2003).

Although these studies provide insights into the impact of relationship quality on cognitive health, most are limited by focusing more on frequency of contact and network size rather than the quality of relationships with network members or by not separating the effects of relationship quality with children from other network members. The studies that do focus on relationship quality with children specifically are from other countries that may have different adult child–parent norms, and are limited by only one follow-up. Further, most studies do not examine the impact of both positive and negative dimensions of relationship quality net of each other on cognitive health; past research suggests that focusing solely on only positive or negative aspects can obscure important facets of these relationships (Bengtson & Oyama, 2010). Although one would expect support to be beneficial and stress to be detrimental to cognitive health, as noted above, some studies do not reach this conclusion; rather they suggest a more complex pattern in which stress in relationships is sometimes beneficial (Birditt & Antonucci, 2008; Seeman et al., 2001; Xu et al., 2016).

Gender, Relationship Quality, and Cognitive Limitations

Parents' experiences with their adult children vary by gender (e.g., Pillemer, Munsch, Fuller-Rowell, Riffin, & Suitor, 2012), and the parental role tends to be more salient to mothers than fathers (Katz-Wise, Priess, & Hyde, 2010). Cultural norms of femininity urge women to put others' needs before their own whereas cultural norms of masculinity encourage men to emphasize their own needs (e.g., Jordon, Walker, & Hartling, 2004), which may prompt mothers to be more affected than fathers by the quality of relationships with their children. Mothers may blame themselves more so than fathers for strained relationships with children (Elliott, Powell, & Brenton, 2015). As a result, mothers may be more affected than fathers by the quality of relationships, both positive and negative, with their adult children.

Women also tend to experience more cognitive limitations than men at older ages (Read et al., 2006), and the potentially stronger influence of relationship quality on mothers may contribute to the gender gap in cognitive health. Women may appraise stress differently than men, potentially viewing relationship problems as more stressful (Gillespie & Eisler, 1992). Women are more likely than men to experience psychological distress in response to stressors (Rosenfield & Mouzon, 2013), so strained relationships with children may induce more psychological distress for mothers than fathers, which may then affect cognitive health (Lee et al., 2010). Moreover, greater perceived emotional support from family, friends, and significant others

has been related to health-promoting behaviors among women but not men (Jackson, 2006). Taken together, past studies suggest possible gender differences in the impact of relationship quality with implications for cognitive limitations for men and women in later life.

We extend prior research on social ties and cognitive health, as well as gender and parent–child relationships, by testing the following hypotheses among older parents:

Hypothesis 1: More emotional support from adult children will slow the development of cognitive limitations over time.

Hypothesis 2: Higher levels of strain with adult children will be associated with the development of more cognitive limitations over time.

Hypothesis 3: Gender will moderate the associations between strain/support and cognitive limitations such that mothers will be more negatively affected by strain and more positively affected by support from children in their cognitive limitation trajectories, compared to fathers.

Method

Data and Measures

We analyze data from the nationally representative panel study, Americans' Changing Lives (ACL), which spans five waves from 1986, 1989, 1994, 2001/02, and 2011/12 (House, 2014). Wave 1 (N = 3,617) includes a multistage stratified area probability sample of the continental United States' household population aged 25 and older, with an oversampling of black respondents and adults aged 60 and older. The original sample at Wave 1 is 62% female, 64.2% white, 54.6% married, with an average age of 53.6, an average of 2.6 children, and a median 12th grade education. We excluded proxy respondents, did not include observations from Waves 3 and 4 which did not contain key strain items, and only included respondents who were parents aged 60 or older at any wave (respondents could age into the analytic sample, but only their observations at age 60+ were used), leading to an analytic sample of 2,788 person-age observations embedded within 1,800 respondents (by gender: 961 observations for 635 men and 1,827 observations for 1,165 women). Our analytic sample is 64.7% female, 70.6% white, 54.7% married, with an average age of 70.4, averaging 3.2 children (every respondent has at least one child), and a median 12th grade education.

Dependent variable

Cognitive limitations was measured with four items from the Short Portable Mental Status Questionnaire (SPMSQ) asking about the (a) date today, (b) day of the week, (c) name of the president of the United States, and (d) basic subtraction. Each item was coded as 0 = *correct* or 1 = *incorrect* and then summed (range: 0–4), with higher scores indicating more cognitive limitations. A logarithmic transformation (adding 1 first, because log (0) is undefined) at each wave was applied to reduce skew, with a range of 0–1.6.

Independent variables

Emotional support from children was based on the average of two items: "How much (does/do) your (son/daughter/children) make you feel loved and cared for?" and "How much (is/are) (he/she/they) willing to listen when you need to talk about your worries or problems?" *Strain from children* was based on the average of two items: "How much do you feel (he/she/they) (makes/make) too many demands on you?" and "How much (is/are) (he/she/they) critical of you or what you do?" Response categories for each item include 0 = *not at all*, 1 = *a little*, 2 = *some*, 3 = *quite a bit*, and 4 = *a great deal*; the range for each measure was 0–4, with higher scores indicating more support/strain. The alpha reliability for strain ranged from 0.49 to 0.68 and for support from 0.65 to 0.88, depending on the wave. These are global measures that cannot differentiate between support/strain from particular children within the family. Both variables were time-varying by age.

Control variables

Race (1 = *white*, 0 = *nonwhite*), *gender* (1 = *female*, 0 = *male*), *education* (highest grade/year of college completed), and *10-year birth cohorts* were included as time-invariant control variables. The following time-varying variables were also controlled: *age* (60–95; centered at 60), *marital status* (1 = *currently married*, 0 = *not currently married*), yearly *family income* from all sources (0 = *less than $5,000* to 10 = *$80,000+*), number of children, whether any children lived in the household with the respondent, stressful life events (summary score of spouse's, parent's, child's, or other close friend/relative's death, divorce, involuntary job loss, assault, robbery, anything else bad happened), number of chronic conditions (including hypertension, lung disease, heart attack, arthritis, diabetes, cancer, stroke, broken bones, and urination beyond control), and how much activities were limited by health (0 = *not at all* to 4 = *a great deal*). We also controlled for time-varying support and strain from other relationships (i.e., spouse/partner, mother, father, and friends/relatives). Thus, we are examining the impact of support/strain from children net of support/strain received from other network members. The strain measures addressed respondents' other relationships being critical and demanding, as well as spousal upset and disagreements. The support measures include making the respondent feel loved/cared for and willingness to listen. Each index represents the average response (0–4) to the items.

Analytic Strategy

We estimated growth curve models within a mixed-model framework. We estimated trajectories of cognitive limitations, which are strongly linked with age, using age rather

than wave as the metric of time, an estimation strategy well-suited to examining age-linked change and advantageous in allowing data that are unbalanced in time (Yang & Lee, 2009). This approach does not assume that everyone in the sample has participated in each wave or experienced every age across the 60–95 range. Alwin, Hofer, & McCammon (2006) argue that in examining cognitive trajectories for an age group, it is not necessary for respondents to be a certain age at baseline but rather to be the age of interest between Wave 1 and Wave *n*. Time-varying variables were restructured by age such that, for example, respondents' ratings of support were ascertained as support at age 70 whether they were age 70 in Wave 1, Wave 2 and so forth, for each year of age from 60 to 95 (due to sparseness in data at the oldest ages, age 95+ were top-coded). After restructuring time-varying variables by age, the data were reshaped long, such that individual respondents could contribute multiple person–age observations.

Growth curve models examine differences between individuals in intra-individual change and estimate a mean growth curve. The intercept (initial level) and slope (growth rate over time) are allowed to vary across individuals. With the hierarchical nature of the data, repeated observations (Level 1) are nested within individuals (Level 2). Variables predicting the slope, or growth, in cognitive limitations were interacted with age (our metric of time), whereas variables predicting the intercept did not involve interactions with age. We tested both linear and quadratic models and found that a linear model fit best.

We used multiple imputation of missing values (Harel & Zhou, 2007), with 10 imputed datasets, imputing with variables from the analysis model. We adjusted for attrition by controlling for the number of waves in which respondents participated (i.e., capturing general nonresponse to these waves, not the number of analytic responses) and death during the observation period (Brown, O'Rand, & Adkins, 2012). Respondents who were younger, female, more educated, had higher income, had no children in the household, and had fewer activity limitations due to health participated in more waves of the survey. Support and strain with children were not related to the number of waves in which respondents participated.

Results

Table 1 displays descriptive statistics for the analytic sample by gender. Compared to men, women scored significantly higher on cognitive limitations and support from adult children, but there were no significant gender differences in strain with children. A significantly higher proportion of men than women were married. Men had significantly more income, more support from other relationships, fewer stressful life events, fewer chronic conditions, and fewer activities limited by health than women. Women participated in more waves in the survey and were less likely to die during the survey period compared to men.

Table 2 displays growth curve models predicting cognitive limitations across age. Model 1 shows the impact of support and strain from children, net of each other and net of all controls, on both the intercept (initial level) and slope (growth rate across age) of cognitive limitations for the full analytic sample. Support from children was significantly

Table 1. Descriptive Statistics (Means and Percentages) of the Analytic Sample by Gender

	Men	Women	Total
Cognitive limitations (0–4)	0.62* (0.8)	0.69 (0.9)	0.67 (0.9)
Logged cognitive limitations (0–1.6)	0.38* (0.5)	0.42 (0.5)	0.39 (0.5)
Strain from children (0–4)	0.7 (0.8)	0.7 (0.8)	0.7 (0.8)
Support from children (0–4)	3.1*** (1.0)	3.4 (0.9)	3.3 (0.9)
Age (60–95)	69.9* (7.7)	70.6 (7.8)	70.4 (7.8)
White	71.3%	70.2%	70.6%
Education (0–17)	11.2 (3.8)	11.0 (3.4)	11.1 (3.5)
Income (1–10)	4.7*** (2.6)	3.6 (2.4)	4.0 (2.5)
Married	72.3%***	45.5%	54.7%
Number of children (1–14)	3.2 (1.9)	3.2 (2.0)	3.2 (1.9)
Children in household	20.3%	21.3%	21.0%
Support from others (0–4)	3.1* (0.7)	3.0 (0.7)	3.0 (0.7)
Strain from others (0–4)	1.0 (0.7)	1.0 (0.6)	1.0 (0.6)
Stressful life events (0–9)	0.9* (0.9)	1.0 (0.9)	0.9 (0.9)
No. of chronic health conditions (0–9)	1.5*** (1.2)	1.8 (1.2)	1.7 (1.2)
Activities limited by health (0–4)	1.1** (1.3)	1.3 (1.3)	1.2 (1.3)
No. of waves (1–3)	2.1*** (0.6)	2.2 (0.6)	2.1 (0.6)
Died	64.9%***	56.7%	59.5%
Observations [number of individuals]	961 [635]	1,827 [1,165]	2,788 [1,800]

Note: Standard deviations for noncategorical variables are included in parentheses.
*$p < .05$. **$p < .01$. ***$p < .001$, two-tailed test between men and women.

Table 2. Growth Curve Model Estimates of the Impact of Relationship Quality With Children on Cognitive Limitations[a]

	Full sample		Men	Women
	Model 1	Model 2	Model 3	Model 4
Key independent variables				
Intercept	0.827*** (0.100)	0.762*** (0.120)	0.677*** (0.162)	0.861*** (0.129)
Support from children	0.008 (0.017)	0.022 (0.025)	0.024 (0.025)	−0.034 (0.020)
Strain from children	0.016 (0.018)	0.045 (0.031)	0.052 (0.031)	0.049* (0.021)
Female	−0.023 (0.030)	0.084 (0.121)		
Female × Support from children		−0.024 (0.033)		
Female × Strain from children		−0.043 (0.037)		
Linear slope (age)	0.015** (0.005)	0.023** (0.007)	0.024** (0.007)	0.013* (0.005)
Support from children	−0.002* (0.001)	−0.004* (0.002)	−0.004* (0.002)	−0.001 (0.001)
Strain from children	−0.001 (0.001)	−0.005 (0.002)	−0.005* (0.002)	−0.000 (0.001)
Female	0.002 (0.002)	−0.010 (0.009)		
Female × Support from children		0.003 (0.003)		
Female × Strain from children		0.006* (0.003)		
Observations	2,788		961	1,827
Number of individuals	1,800		635	1,165

Note: Standard errors in parentheses. Models control for race, birth cohort, education, income, marital status, number of children, children living in household, stressful life events, chronic conditions, activity limited by health, support from other relationships, strain from other relationships, waves participated in, and death during the survey period.

[a]Cognitive limitations were logged to reduce skew.

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

related to fewer cognitive limitations. Model 2 included interactions of support and strain by gender, which yielded a significant interaction of gender by strain with children impacting the slope of cognitive limitations.

To better understand gender differences in the impact of relationship quality on cognitive limitations, we stratified the analyses by gender in Models 3 (men) and 4 (women). Model 3 shows a significant interaction of both strain and support by age, suggesting that both strain and support with adult children may be protective against cognitive limitations for fathers as they age. For mothers (Model 4), support is not significantly related to cognitive limitations, but the impact of strain with children is significant such that women experiencing higher levels of strain with children have higher initial levels of cognitive limitations.

Figure 1 illustrates the relationship between strain and cognitive limitations across age by gender from Models 3 and 4, holding all other variables at their means. Note that mothers experiencing high strain (1 SD above the mean) with their children start with the highest levels of cognitive limitations, reflecting the significant association of strain on initial levels of cognitive limitations among women in Model 4. Paths diverge with age such that high-strain fathers' cognitive limitations increase at a much slower rate than high-strain mothers, reflecting the significant strain by age interaction among men in Model 3.

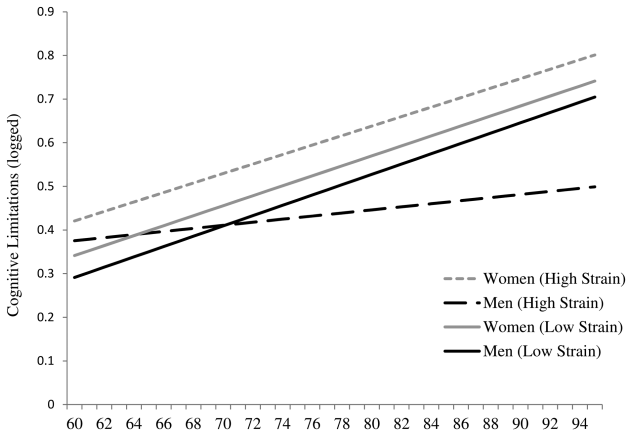

Figure 1. Cognitive Limitations Across Age by Gender and Strain with Children

Discussion

Cognitive decline is a significant concern in the context of an aging population, calling for a better understanding of environmental factors that influence the cognitive health of the growing at-risk population of older adults. Adult child–parent relationship quality is an environmental factor warranting greater attention. Parent–child relationships are enduring and consequential for parents' health and well-being across the life course (Reczek & Zhang, 2016; Umberson et al., 2010), yet there is a dearth of research investigating whether positive and negative aspects of relationships with adult children influence parents' cognitive health as they age. Moreover, little attention has been directed to whether gender potentially structures this link, even though mothers and fathers tend to experience relationships with children differently (e.g., Pillemer et al., 2012). Further, our study extends the cognitive health

literature by considering the role of support and strain in parent–adult child relationships outside the context of purely caregiving relationships. We worked from a stress and life course perspective (Elder et al., 2003; Pearlin et al., 2005) and analyzed longitudinal, nationally representative data to consider whether relationships with adult children might protect against or exacerbate trajectories of cognitive decline among aging mothers and fathers.

We found that relationship strain is linked to cognitive limitations, but its impact is complicated by gender. Women experiencing greater strain with children start with higher levels of cognitive limitations than men, yet relationship strain appeared to be *protective* against subsequent cognitive decline for aging fathers but not mothers. It may be that criticism and demands (items of the strain measure) have different meanings and consequences for mothers and fathers. Adult children often critique and regulate parents' health habits and try to get their parents to engage in healthier behaviors (Birditt & Antonucci, 2008; Reczek et al., 2014); prior research shows that men are more likely than women to be influenced by these efforts (Umberson, 1987), and improved health behaviors may protect against cognitive decline (Lee et al., 2010). The meanings attached to strain for fathers and mothers may influence their impact differently. Strained relationships may be more troubling or distressing for mothers, whereas strained relationships may indicate that children are engaged and connected to fathers. Mothers may have more negative psychological responses to critiques and demands from their adult children, with negative ramifications for their cognitive health. Relationship strain may be a milder stressor for fathers, and mild stress has been linked to better cognitive health (Comijs et al., 2011), whereas relationship strain with adult children may be perceived as more stressful for mothers, with implications for cognitive health (Friedman et al., 2012). Future research should further explore possible gender differences in various facets of relationships between adult children and their aging parents and how those facets might influence cognitive health through psychological, behavioral, and physiological pathways.

Although many studies demonstrate the benefits of emotional support for health (Umberson & Montez, 2010), we do not find a significant effect of emotional support from children on older parents' cognitive limitations net of strain with children among mothers, but we do find a beneficial effect of both higher support and higher strain for fathers' cognitive limitations. These differences in cognitive health increase such that fathers with higher support and strain have lower levels of cognitive limitations as they age than do fathers with lower support and strain. It may be that fathers who are experiencing more support and/or more strain are particularly engaged with their adult children and reaping health benefits from this engagement. Mothers' relationships with adult children are often characterized by a high level of support that may be considered normative or expected (Knoester, 2003), and this expectation may dampen the impact of support on cognitive health. Moreover, our study contributes to the broader literature on social relationships and health suggesting the potency of negative social experiences for health (e.g., Rook, 2014), though not always in the expected direction. We focus on emotional support, but other dimensions of social support should be examined and might produce a different pattern of results. Importantly, many studies do not consider both positive and negative dimensions of relationship quality in the same study, which may fail to capture the nuanced impact of social relationships and potentially overestimate the impact of support. Our findings, compared to other studies showing the impact of support but that do not include strain in the models, point to the importance of considering both positive and negative dimensions of relationships in future studies.

Limitations

Several limitations should be considered when interpreting the results of this study. First, support and strain from children are global measures of relationships with all children whether the respondent had one or multiple children. Relationship quality may differ with each child in the family. For example, support from a particular child may prompt a mother's favoritism of that child (Suitor, Gilligan, & Pillemer, 2013), and favoritism may influence the impact of support or strain. Further, pleasant or stressful interactions with children may influence parents' mood (Fingerman, Kim, Birditt, & Zarit, 2016), which may influence psychological pathways for cognitive health. Future studies that can separate support and strain with each child and further address these issues by gender of parent and child are needed. Second, we do not have information on adult children's resources, such as educational attainment, which may also vary within families. More highly educated adult children may engage their parents in more intellectual activities, encourage more physical activity, and so forth, with implications both for their relationship quality and parents' cognitive health. Third, key strain measures were not available in the third and fourth waves, which limited growth curve models to three waves of data, with a large gap in time between Waves 2 and 5. However, an advantage of age-based trajectory methods is that age is the metric of time and there was coverage of every age, 60–95. Age-based trajectories combine respondents who are, for example, age 60 at Wave 1 with those age 60 at Wave 5, which is a limitation in that respondents of the same age can be from different birth cohorts. However, controlling for birth cohort did not alter the pattern of results. Fourth, although our measure of cognitive limitations is an accepted measure for use in large-scale surveys, this measure does not capture all aspects of cognition. Future research should examine how relationship quality with children may be associated with different dimensions of cognitive health. Finally, reverse causality is difficult to completely rule out. However, we explored this possibility

in supplementary analyses using strain with children as the dependent variable using the same type of age-based trajectory model and control variables as presented above, and cognitive limitations were not significantly related to either the initial level or change in strain across age. Nevertheless, future research is called for to confirm this pattern of results, especially considering the finding that strain may be beneficial for cognitive health for men was somewhat unexpected.

Conclusion

Relationships with children remain central to parents throughout life, and the quality of those relationships has been associated with parents' psychological well-being and physical health in past research. Our findings suggest that the quality of relationships with children may influence parents' cognitive health in unexpected ways, and differently for mothers and fathers, contributing to the gender gap in cognitive limitations. Given the aging of the U.S. population and growing concerns about cognitive health in this population, interventions aiming to reduce cognitive limitations among older adults may benefit from paying attention to family relationships as one part of a multi-pronged approach. Our findings also highlight the importance of taking gender into account when studying whether positive and negative aspects of social relationships affect older adults.

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