The Effects of Work-Family Experiences on Health among Older Workers

Eunae Cho

Nanyang Technological University

Tuo-Yu Chen

Nanyang Technological University

Author Note

Eunae Cho, Psychology, School of Social Sciences, Nanyang Technological University, Singapore; Tuo-Yu Chen, Ageing Research Institute for Society and Education, Nanyang Technological University, Singapore.

Correspondence concerning this article should be addressed to Eunae Cho, Nanyang Technological University, 14 Nanyang Dr., Singapore, 637332. Email: eunaecho@ntu.edu.sg.

The Health and Retirement Study is funded by National Institute on Aging (NIAU01AG009740) and conducted by the University of Michigan. The authors did not receive any funding for the current study. An earlier version of this paper was presented at the 30th annual meeting of the Society for Industrial and Organizational Psychology, Philadelphia, Pennsylvania, USA.

Abstract

With the rapidly aging workforce worldwide, the need to retain healthy older workers is greater than ever. To promote health among older workers, a better understanding on the factors that contribute to their health is crucial. With this in mind, we investigated the impact of work-family conflict and work-family enrichment on older workers' health. Five waves of longitudinal data from the Health and Retirement Study were used. A total of 4509 workers aged 55 years and older at baseline were included. Multilevel modeling was conducted to analyze the data. Our findings showed that greater work-to-family conflict was related to higher comorbidity and greater disability over time, controlling for other known predictors of health (employment status, total household income, living arrangement, marital status, depressive symptoms, and baseline demographic characteristics). No other work-family variables significantly predicted the health outcomes. Comorbidity and disability were also found to predict work-to-family conflict. Using five waves of longitudinal data, our research showed that work that interferes with family negatively affects older workers' physical and functional health and that health relates to work-to-family conflict. Given the growing number of older workers and changing work and family situations, continued monitoring of work-family experiences among older workers is warranted.

Keywords*:* older workers, work-family conflict, work-family enrichment, comorbidity, disability

The Effects of Work-Family Experiences on Health among Older Workers

The global workforce is aging rapidly (Phillips & Siu, 2012). With the graying workforce, maintaining senior workers' health is a critical concern for organizations because health is an important factor for labor participation (Taylor & Shore, 1995; van Rijn, Robroek, Brouwer, & Burdorf, 2014). Previous research on potential economic and societal impact of a large amount of older workers exiting the labor market (Carrière & Galarneau, 2011; Pingle, October 2006) further reiterates the need to retain older workers in the workforce. In attempts to delay retirement, various policies have been considered (e.g., pension reforms; Burniaux, Duval, & Jaumotte, 2004; Hicks, 2011), but the success of these policies may in part depend on older workers' health status (Cai & Kalb, 2006; Johnson, 2004). In sum, it is imperative to understand factors that affect older workers' health.

In this study, we investigate work-family experiences as determinants of older workers' health. The work-family literature suggests that individuals' involvement in multiple life domains (e.g., work, family) may lead to positive as well as negative experiences (See Allen, 2012 for a review). *Work-family conflict* (WFC) is a form of inter-role conflict that occurs when contextual demands in one domain drain personal resources, leaving insufficient amount of resources to handle contextual demands in the other domain (ten Brummelhuis & Bakker, 2012). *Work-family enrichment* (WFE) occurs when contextual resources in one domain generate personal resources, facilitating performance in another domain (ten Brummelhuis & Bakker, 2012). Both WFC and WFE are bidirectional such that experiences in the work domain can affect family, and vice versa. Considering the valence and direction, work-family experiences comprise the four constructs: work-to-family enrichment (WTFE), work-to-family conflict (WTFC), family-to-work enrichment (FTWE), and family-to-work conflict (FTWC).

Concerning the relevance of work-family experiences for senior workers, scholars have suggested that successful management of work and family is important for individuals across all ages (Allen & Shockley, 2012). This is because work and family represent the major domains for adult life (Frone, Russell, & Cooper, 1992) and achieving balance between work and family is a concern for individuals of all ages (Darcy, McCarthy, Hill, & Grady, 2012). Work-family interface in later adult life merits further investigation because of unique characteristics of older workers. As people grow older, contextual demands and resources present in work and family and the degree of personal resources change. For instance, older workers tend to have less family demands than younger workers (Bengtson & Allen, 1993). Regarding personal resources, evidence suggests that age is positively associated with knowledge, experiences, and emotion regulation skills (Huffman, Culbertson, Henning, & Goh, 2013; Urry & Gross, 2010). These findings imply that older workers' work-family experiences differ from younger workers' experiences in that work-family interface is shaped by contextual factors and personal resources (ten Brummelhuis & Bakker, 2012). In support of this notion, studies found that older workers report higher WFE and lower WFC compared to their younger counterparts (Allen & Finkelstein, 2014; Grzywacz, Almeida, & McDonald, 2002). In sum, the importance of work and family domains and the aging-related changes necessitate the investigation of work-family experiences among senior workers.

With this in mind, we examine the impact of work-family experiences on health among older workers. Although significant relationships were found between the work-family experiences and health outcomes (Amstad, Meier, Fasel, Elfering, & Semmer, 2011; McNall, Nicklin, & Masuda, 2010), the findings are predominantly based on young and mid-aged adults, hence may not be generalizable to older workers. Moreover, individuals' health tends to

deteriorate with advanced age (Salomon et al., 2012; Truxillo, Cadiz, & Hammer, 2015; Wolff, Starfield, & Anderson, 2002). As such, whether work-family experiences are significant predictors of health among older workers remains unclear.

To address our research question, we assessed older adults' physical and functional health using nationally representative longitudinal data from the U.S. (the Health and Retirement Study). For physical health, we used comorbidity as the indicator. *Comorbidity* concerns diagnosed chronic conditions (e.g., hypertention, diabetes, heart disease; Schnittker, 2005; Wolff et al., 2002) that are incurable, but not immediately life-threatening. Utilizing comorbidity as an indicator of health among older workers is important because these conditions are common in old age; about 82% of the older adults have one or more chronic conditions and 65% have multiple conditions (Wolff et al., 2002). For functional health, we used disability as the indicator. *Disability* is a person's inability to perform a task (e.g., difficulty with walking, using phone) within a given environment due to health conditions (Janke, Chen, & Young, 2015; Verbrugge, 1989). Disability is also prevalent in the older population. Over 30% of older adults have at least one disability (He & Larsen, 2014). Of importance, both comorbidity and disability may present barriers to work and are related to older workers' decision on retirement (Jason, Carr, Washington, Hilliard, & Mingo, 2017; van Rijn et al., 2014). Besides, comorbidity and disability increase with age (Chatterji, Byles, Cutler, Seeman, & Verdes, 2015), and therefore, finding ways to delay or manage them is critical.

As the first longitudinal study to delve into health consequences of work-family experiences in later working life, this study makes three meaningful contributions to the literature. First, this research expands our knowledge on the factors that affect older workers' health by identifying a novel predictor. Building on previous research recognizing the impact of

various work-related factors on older workers' health (e.g., Griffiths, 2000) and the relevance of work-family issues among older workers (Baltes & Young, 2007), we propose that positive and negative ways that work interacts with the other core life domain are likely to affect older workers' health. Considering the importance of health among mature workers (van Rijn et al., 2014), our research addresses a critical gap in the extant literature.

Second, the current study adds to the growing body of work-family research targeting older workers. Our study offers a holistic view on the health implication of work-family experiences by considering both positive and negative work-family experiences. Although scholars have emphasized the importance of simultaneously studying WFC and WFE because they are independent processes that are likely to co-occur (Greenhaus & Powell, 2006), much of previous research on older workers' work-family experiences has primarily focused on WFC (e.g., Allen & Finkelstein, 2014; Thrasher, Zabel, Wynne, & Baltes, 2016).

Lastly, we present stronger evidence for the impact of work-family experiences on health by utilizing longitudinal data. Unlike cross-sectional design that is known to be confounded by cohort effect and not suitable for examining the patterns over time, longitudinal design allows us to assess within-person changes in work-family experience over time. Moreover, longitudinal data can better depict temporal relationships among work-family experiences and health, which helps establishing causality.

The work-home resources model (the W-HR model) is a theoretical framework to explain the relationship between work-family experiences and older workers' health (ten Brummelhuis & Bakker, 2012). The W-HR model draws on the conservation of resources theory (the COR theory; Hobfoll, 2001), which posits that individuals strive to gain, protect, and maintain resources (i.e., objects, personal characteristics, conditions, or energies that are valued and sought) because

resources help manage demands and gain more resources. For this reason, obtaining and maximizing resources is thought to enhance wellbeing, whereas anticipated or actual loss of the resources leads to reduced wellbeing.

According to the W-HR model, work-family interface is a process whereby contextual demands and resources in one domain influence outcomes in the other domain via personal resources. WFE signals gain of personal resources as it occurs when contextual resources in one domain improve functioning in another domain via increased personal resources (Hakanen, Peeters, & Perhoniemi, 2011; Wayne, Grzywacz, Carlson, & Kacmar, 2007). WFC indicates loss of personal resources as it occurs when an individual has insufficient personal resources to deal with multiple demands from work and family domains (Cho & Tay, 2015; Grandey & Cropanzano, 1999). Thus, WFE and WFC should relate to positive and negative health outcomes, respectively. Empirical evidence gathered from younger employees suggests that WTFE and FTWE related to better health, indicated by outcomes such as depression, cholesterol level, and body mass index (e.g., Grzywacz & Bass, 2003; van Steenbergen & Ellemers, 2009). Studies have also found the proposed adverse impact of WFC on health, such that greater WTFC and FTWC relate to increased somatic symptoms, increased depression, and decreased perception of overall health (e.g., Frone, Russell, & Barnes, 1996; Thomas & Ganster, 1995).

Further delving into the differential effect of work-family experiences on health, we consider the frequency and salience of work-family experience. Research to date documented that conflict is more frequent in the work-to-family direction (Bellavia & Frone, 2005), whereas enrichment is more prevalent in the family-to-work direction (Greenhaus & Powell, 2006). In terms of salience, scholars have suggested that older workers tend to place a greater emphasis on family relative to work (Thrasher et al., 2016) because as individuals age, the motives for growth

and development decrease while desires for satisfaction and quality social relationships increase (Rudolph, Baltes, & Zabel, 2013). As such, older workers may be more sensitive to WTFC than to FTWC, while more appreciative of WTFE than of FTWE. Taken together, WTFC might have a greater impact on health than does FTWC because WTFC is more frequent and more bothersome. In contrast, WTFE and FTWE may have comparable impact because FTWE is more frequent, but WTFE is more appreciated. Meta-analytic evidence supports this assumption such that the harmful impact of WTFC on health tends to be stronger than that of FTWC (Amstad et al., 2011), whereas WTFE and FTWE have a similar effect on health (McNall et al., 2010).

Based on the theory and empirical evidence, we hypothesize that WTFE and FTWE have a positive association with older workers' health, whereas WTFC and FTWC have a negative association with older workers' health. We further hypothesize that the impact of WTFC on health is greater than that of FTWC.

Hypothesis 1: WTFE positively relates to health.

Hypothesis 2: FTWE positively relates to health.

Hypothesis 3: WTFC negatively relates to health.

Hypothesis 4: FTWC negatively relates to health.

Hypothesis 5: WTFC has a stronger association with health than does FTWC.

Method

Data

Data were drawn from the Health and Retirement Study (HRS), a longitudinal study, which is based on a nationally representative sample aged 50 years and older in the U.S. The HRS is funded by National Institute on Aging (NIAU01AG009740) and conducted by the University of Michigan. Participants were interviewed every two years. More information about

the HRS can be obtained from Sonnega and colleagues (2014). The present study used the data collected in 2006, 2008, 2010, 2012, and 2014. Consistent with previous research, we defined older workers as those aged 55 years and above (CDC National Center for Chronic Disease Prevention and Health Promotion, 2012; Truxillo et al., 2015).

Measures

The outcome variables of this study were comorbidity and disability. Based on previous research, factors that are known to predict comorbidity and disability were used as control variables. Specifically, full-time work (Rosenthal, Carroll-Scott, Earnshaw, Santilli, & Ickovics, 2012), higher socioeconomic status (i.e., total household income and education; Krieger, Chen, Waterman, Rehkopf, & Subramanian, 2003), and being married (Verbrugge, Gates, & Ike, 1991) positively relate to health, whereas living alone (Kharicha et al., 2007), having depressive symptoms (Cronin-Stubbs et al., 2000), and being older, female, and non-White (Chatterji et al., 2015; Krieger et al., 2003) negatively relate to health. All control variables were included in analyses as time-varying variables, except for age at baseline, education, sex, and race.

Work-family experiences. In the HRS, each work-family construct was measured by three items (MacDermid et al., 2000). Participants were asked to answer these items only if they were currently working (Smith et al., 2013). All items of this measure are listed in Table 1. Participants were asked to reflect on their experience during the last month and rated each item on a 4-point scale (1 = *rarely*, 2 = *sometimes*, 3 = *often*, and 4 = *most of the time*). For analyses, an average score was calculated for each construct for each individual. Higher scores indicated higher prevalence of the construct. The Cronbach's alpha ranged from.76 to .80 for WTFE, .81 to .83 for FTWE, .68 to .72 for WTFC, and .62 to .72 for FTWC.

Comorbidity. In each wave of the HRS interview, participants were asked if they were informed by doctors that they had any of the following conditions: high blood pressure, diabetes, cancer (excluding skin cancer), lung disease, heart disease, stroke, emotional or psychiatric problems, or arthritis. Previous research has shown good agreement between self-reported chronic conditions and objective medical records among older adults (Bush, Miller, Golden, & Hale, 1989; Haapanen, Miilunpalo, Pasanen, Oja, & Vuori, 1997). For analyses, the total number of conditions for each individual (ranging from 0 to 8) was used, with a higher score indicating more comorbidities.

Disability. In each wave of the HRS interview, participants were asked whether they had difficulty with performing the following activities because of a physical, mental, emotional, or memory problem: dressing, walking, bathing, eating, getting in/out of bed, toileting, using maps, preparing meals, grocery shopping, using phone, taking medications, and managing money. The self-reported difficulty with daily activities is related to performance-based measures (Reuben, Valle, Hays, & Siu, 1995). Individuals indicated difficulty with a given activity was coded as 1, otherwise 0. The total score was used for analyses (ranging from 0 to 12); a higher score indicated more disabilities.

Employment status. Participants reported the number of hours a week they usually work. The average working hours were 36.19 (n = 3611; SD = 15.02), 35.22 (n = 3444; SD = 14.93), 33.54 (n = 2946; SD = 15.52), 32.64 (n = 2476; SD = 15.49), and 31.09 (n = 1945; SD = 16.00), respectively, from 2006 to 2014. Full-time employment was defined as working 40 hours or longer, and part-time employment as working less than 40 hours. This variable was dummy-coded (full-time = 1, part-time = 0).

Depressive symptoms. The HRS used the 8-item Center for Epidemiologic Studies - Depression Scale to assess depressive symptoms (Turvey, Wallace, & Herzog, 2005). Participants were asked much of the time during the past week, whether they felt "depressed," "everything was an effort," "happy (reverse-coded)," "lonely," "sad," and "could not get going," if they "enjoyed life (reverse-coded)," and if they had "restless sleep." The response to each item was yes/no. The total score was used for analyses (ranged from 0 to 8), with a higher score indicating more depressive symptoms.

Total household income. This variable was the sum of earnings in the last calendar year from people lived in the same household. These earnings included money received from: employment and self-employment; unemployment and workers compensation; trades, stocks, bonds, certified deposits, and bank accounts; tips, bonus, and commissions; social security income and supplemental security income; food stamps and welfare; veteran benefits; pension and annuity; and rental income. The sum of earnings was categorized into the following eight levels: 1= $0-$10,000, 2 = $10,001-$20,000, 3 = $20,001-$35,000, 4 = $35,001-$50,000, 5 = $50,001-$75,000, 6 = $75,001-$100,000, 7 = $100,001-$150,000, and 8 = above $150,000.

Living arrangement and marital status. During the HRS interview, co-residence status and marital status were asked. Both living arrangement (live alone = 1, otherwise = 0) and marital status (married = 1, not married = 0) were dummy-coded.

Baseline demographic characteristics. Age and education were recorded in years. Sex (female = 1, male = 0) and race (White = 1, non-White = 0) were dummy-coded.

Study Design

All variables used in the current study were assessed every two years except for work-family experiences variables. Data on work-family experiences were retrieved from the

Psychosocial and Lifestyle Questionnaire in the HRS (MacDermid et al., 2000; Smith et al., 2013), which was piloted in 2004 and updated in 2006. The first 50% random sample from the longitudinal panel was selected to administer the questionnaire in 2006. The second 50% random sample received the questionnaire in 2008. The questionnaire was given in a rotating fashion such that the longitudinal data were collected from the first random sample in 2010 and 2014 and from the second random sample in 2012 (for details see Smith et al., 2013). This strategy of data collection is planned missing, which is a case of missing completely at random (Graham, 2012). Therefore, all available data on work-family experiences were used for analyses to estimate their effects on health across the five waves. Figure 1 displays an excerpt from the data on employment status and WTFC.

There were 38192 individuals in the dataset after merging data from 2006 to 2014. Individuals who were younger than 55 years old at baseline and lacked demographic information were excluded from the analyses. Those who did not have any information on work-family experiences and did not work in any of the five waves were also excluded. The final sample consisted of 4509 participants, with a mean age of 62.96 years old (SD = 6.49), an average 13.35 years of education (SD = 2.87), and 51% female and 80% White at baseline. The study design and exclusion flow are found in Figure 1. Compared to the individuals who were excluded because of not working and/or no information on work-family experiences (n = 24795), the studied sample was younger (62.96 years old [SD = 6.49] vs. 76.19 years old [SD = 11.82], $t(10869.92) = -108.15$, $p < .001$), had more years of education (13.35 years [SD = 2.87] vs. 11.56 years old [SD = 3.53], $t(7244.27) = 37.08$, $p < .001$), and had fewer female (51% vs. 56%, $\chi^2(1, n = 29304) = 40.67$, $p < .001$). No difference in race was found.

Analytic Strategy

We used multilevel modeling to analyze the data. Multilevel modeling was deemed appropriate for the purpose of this study because it can capture systematic change of an outcome over time considering time-invariant and time-varying predictors (e.g., do work-family experiences predict changes in health?; Raudenbush & Bryk, 2002). Moreover, compared to traditional longitudinal analysis (e.g., repeated measures analysis of variance), multilevel modeling analyzes all available data and does not use listwise deletion. Individuals with more data points are weighted more heavily than those with fewer data points. As such, rigid data collection schedule and the same number of waves per participant are not necessary. As long as the missingness satisfies the missing completely at random or missing at random assumption, even when an individual provides only single data point in a longitudinal dataset, the data point can be used to estimate mean and variance (Raudenbush & Bryk, 2002).

We used the Hierarchical Linear Modeling software (6.02; Scientific Software International, Lincolnwood, IL) to estimate multilevel models. In the level 1 model, each individual's data were fitted on a regression line to estimate individual trajectory. In the level 2 model, individual characteristics were entered to examine the effects of between-individual differences (e.g., sex, race) on the level 1 intercepts and slopes (Raudenbush & Bryk, 2002).

We first built unconditional models to estimate total outcome variation for both comorbidity and disability (e.g., equation 1). Next, unconditional growth models were fitted (e.g., equation 2). Time was calculated by centering age in each year on baseline age (i.e., 0, 2, 4, 6, 8). For an outcome that changed significantly over time (i.e., indicated by the significant slope of Time [β_{1j}]), conditional growth model was estimated. In conditional growth model (e.g., equation 3), work-family experiences (all grand mean centered), employment status, total household income, living arrangement, marital status, and depressive symptoms (grand mean centered)

were entered in the level 1 model to investigate their effects on the health measure. Age at baseline (grand mean centered), sex, race, and education (grand mean centered) were included in the level 2 model to estimate individuals' initial scores of comorbidity and disability. For each level 1 parameter, fixed slope (i.e., individuals change in the same way across time) and random slope (i.e., each individual changes in unique way across time) were examined. Maximum likelihood was used to estimate variance and variance components. A random slope was retained in the model if significant variance was observed across individuals, otherwise a fixed slope was chosen for the model. Model fit was assessed using Akaike Information Criterion (AIC; Raudenbush & Bryk, 2002). An alpha level lower than .05 was considered as statistical significance.

Unconditional model:

$$\text{Level 1: } \text{Comorbidity} = \beta_{0j} + r_{ij} \quad (1)$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + u_{0j}$$

Unconditional growth model:

$$\text{Level 1: } \text{Comorbidity} = \beta_{0j} + \beta_{1j}(\text{Time})_{ij} + r_{ij} \quad (2)$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + u_{0j}$$

$$\beta_{1j} = \gamma_{10} + u_{1j}$$

Conditional growth model:

$$\text{Level 1: Comorbidity} = \beta_{0j} + \beta_{1j}(\text{Time})_{ij} + B_{2j}(\text{depressive symptoms} - \overline{\text{depressive symptoms}}))_{ij} + B_{3j}(\text{living arrangement})_{ij} + \beta_{4j}(\text{income})_{ij} + \beta_{5j}(\text{married})_{ij} + \beta_{6j}(\text{WTFE} - \overline{\text{WTFE}}))_{ij} + \beta_{7j}(\text{WTFC} - \overline{\text{WTFC}})_{ij} + \beta_{8j}(\text{FTWE} - \overline{\text{FTWE}}))_{ij} + \beta_{9j}(\text{FTWC} - \overline{\text{FTWC}})_{ij} + \beta_{10j}(\text{employment status})_{ij} + r_{ij} \quad (3)$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + \gamma_{01}(\text{age at baseline})_j + \gamma_{02}(\text{sex})_j + \gamma_{03}(\text{race})_j + \gamma_{04}(\text{education})_j + u_{0j}$$

$$\beta_{1j} = \gamma_{10} + u_{1j}$$

$$\beta_{2j} = \gamma_{20} + u_{2j}$$

$$\beta_{3j} = \gamma_{30} + u_{3j}$$

$$\beta_{4j} = \gamma_{40} + u_{4j}$$

$$\beta_{5j} = \gamma_{50} + u_{5j}$$

$$\beta_{6j} = \gamma_{60} + u_{6j}$$

$$\beta_{7j} = \gamma_{70} + u_{7j}$$

$$\beta_{8j} = \gamma_{80} + u_{8j}$$

$$\beta_{9j} = \gamma_{90} + u_{9j}$$

$$\beta_{10j} = \gamma_{100} + u_{10j}$$

Results

Table 2 shows the characteristics of the studied sample. Overall, the percentage of older workers who lived alone increased while that of married older workers decreased throughout the five waves. The distribution of total household income was consistent from 2006 to 2014. The proportion of full-time working older workers was higher than that of part-time in 2006, and this trend reversed after 2010. Notably, older workers in our study experienced WTFE (M = 2.85-2.96) and FTWE (M = 3.22-3.25) frequently, yet experienced WTFC (M = 1.46-1.53) and FTWC (M = 1.15-1.17) only occasionally throughout the study period. The average depressive symptoms did not vary much across the five waves. Finally, the number for comorbidity and disability increased from 2006 to 2014.

Hypotheses Testing

Comorbidity. Table 3 and Figure 2-A present findings from the multilevel model for comorbidity. The unconditional model (Model 1) indicated that the initial scores significantly differed from zero (γ_{00} = 1.89, p < .001) and varied across individuals (τ_{00} = 1.43, p < .001). In the unconditional growth model (Model 2), the results showed that the comorbidity score increased at a rate of .08 every two years (γ_{10}, p < .001), suggesting that individuals developed more health conditions as they aged. Significant variances were observed for the average comorbidity score at baseline (τ_{00} = 1.50, p < .001) and Time (τ_{11} = .01, p < .001), suggesting that

there was between-person variability in terms of older workers' comorbidity scores at baseline as well as the rates of developing health conditions.

Because comorbidity scores changed significantly over time, a conditional growth model was specified with intercept and Time entered as random effects (Model 3). The results of the conditional growth model showed that the average initial comorbidity score was 1.64 (γ_{00}; $p < .001$), adjusting for age at baseline, sex, education, and race. Overall, older workers developed health conditions at a rate of .07 per wave ($\gamma_{10;}$ $p < .001$). For the effects of work-family experiences on comorbidity, only the slope for WTFC was significant ($\gamma_{30} = .08$, $p < .01$); older workers who reported one unit higher on WTFC would experience .08 additional health condition every wave. Therefore, Hypothesis 3 that concerned the negative impact of WTFC on health was supported. Hypotheses 1, 2, and 4 were not supported because WTFE, FTWE, and FTWC did not significantly relate to older workers' comorbidity. Hypothesis 5 that proposed the differential impact of WTFC versus FTWC was supported, as WFTC, but not FTWC, significantly predict comorbidity.

Disability. Table 4 and Figure 2-B show the results of the multilevel models for disability. The results from the unconditional model (Model 1) showed that the initial scores significantly differed from zero ($\gamma_{00} = .34$, $p < .001$) and varied across individuals ($\tau_{00} = .48$, $p < .001$). In the unconditional growth model (Model 2), the results showed that disability score increased at a rate of .04 every two years (γ_{10}, $p < .001$), indicating that older workers experienced more disabilities as they aged. Significant variances were observed for the average disability score at baseline ($\tau_{00} = .15$, $p < .001$) and Time ($\tau_{11} = .01$, $p < .001$), which indicated that older workers' disability scores at baseline and the rate of change significantly varied across individuals.

Because disability changed significantly over time, a conditional growth model was estimated with intercept and Time entered as random effects (Model 3). The results of the conditional growth model showed that the average initial disability score was .33 (γ_{00}; $p < .001$), adjusting for age at baseline, sex, education, and race. Overall, older workers reported experiencing more disabilities at a rate of .01 per wave (γ_{10}; $p < .001$). For the effects of work-family experiences on disability, the results showed that only the slope of WTFC ($\gamma_{70} = .08$, $p < .001$) was significant. This means that older workers who reported one unit higher on WTFC would have .08 additional disability per wave. The significant slope of WTFC lends support to Hypotheses 3. Hypothesis 1, 2, and 4 were not supported because there was no significant impact of WTFE, FTWE, and FTWC on disability. Hypothesis 5 that proposed the differential impact of WTFC versus FTWC was supported, as WFTC, but not FTWC, significantly relate to disability.

Exploratory Analyses

Although much of research has conceptualized work-family experiences as antecedents of health, it is also plausible that health predicts work-family experiences in that health is one of key personal resources (ten Brummelhuis & Bakker, 2012). Indeed, a recent meta-analysis of longitudinal studies suggests reciprocal relationships between WFC and health outcomes (Nohe, Meier, Sonntag, & Michel, 2015). In light of the current findings, we explored bidirectional associations between WTFC and health by testing whether comorbidity and disability predicted WTFC. The results showed that both comorbidity and disability were significant predictors of WTFC in the conditional growth model (Supplementary Table 1 and Figure 1). Specifically, older workers who experienced one additional health condition and disability would report higher WTFC by .03 and .05 per wave, respectively. Thus, the findings indicate that WTFC and health have reciprocal relationships among older workers.

Discussion

With the rapidly aging workforce worldwide, the need to retain healthy older workers is greater than ever. To promote health among older workers, a better understanding on the factors that contribute to their health is crucial. With this in mind, we examined whether work-family experiences predict older workers' health. Based on the five waves of longitudinal data from representative sample, our research highlighted the important role of work-family experiences in older workers' physical and functional health; however, the valence and direction matter.

WTFC was a significant predictor of both comorbidity and disability, explaining unique variance above and beyond the established health determinants. This is striking given the low level of WTFC reported throughout the study period. Notably, the impact of WTFC as a predictor of the health outcomes was comparable to that of depressive symptoms. In line with the theoretical propositions (ten Brummelhuis & Bakker, 2012), WTFC represents the state in which personal resources are drained due to contextual demands. The lack of personal resources leads to suboptimal wellbeing (Hobfoll, 2001), which was manifested as increased number of health problems and functional limitations.

Regarding the stronger impact of WTFC on health, it is important to note that the experience of WTFC versus FTWC was similar in our sample of older workers (See Table 2). This suggests that the differential impact on health observed in our study is likely to be because of the salience of family to older workers. Due to older workers' family-centric attitudes (Thrasher et al., 2016), the rare occurrence of family interfering with work might not bring about negative effect on health. Conversely, even the rare incidents of work interfering with family seem to have an adverse impact. Previous research suggests that older individuals strive to maximize positive experiences while minimizing negative ones because they perceive that time

is limited (Jopp & Smith, 2006). In relation to work-family issues, older workers employ various coping strategies to optimize their work-family experiences (Baltes & Young, 2007). When work interferes with family despite all the efforts to reduce WTFC, older workers might experience extensive strain. This strain may relate to health problems such as hypertension (Frone, Russel, & Cooper, 1997) or unhealthy coping behaviors (e.g., alcohol comsumption; Frone et al., 1997), which are precursors of comorbidity and disability (Noh et al., 2016; Oslin, 2000). Also, WTFC among older workers might be intertwined with various life stressors, such as financial strain (Kahn & Pearlin, 2006) and concerns about the cost of healthcare after retirement (Smyer & Pitt-Catsouphes, 2007), which can subsequently cause more health problems.

Concerning WFE, WTFE and FTWE were not associated with comorbidity and disability, which contradict findings based on younger workers (McNall et al., 2010). We suspect that health problems and functional limitations inevitably increase as people age (Ng & Feldman, 2013; Salomon et al., 2012). That is, even though older workers frequently experienced WFE, the health benefits of WFE might be overshadowed by individuals' health issues, which have likely accumulated over many years.

Finally, comorbidity and disability predicted WTFC, suggesting reciprocal relationships. Older workers who experience health problems and functional difficulties may find it more challenging to handle work demands and subsequently become more vulnerable to WTFC. WTFC, in turn, negatively affects older workers' health. These findings depict a vicious cycle that resource depletion ensues from the initial loss of resources, which is in line with the proposition of the COR theory (Hobfoll, 2001). Our results add to the extant work-family literature in that the reciprocal relationship was observed from older population and with a longer time lag.

In sum, our research contributes to the literature on aging workforce by identifying an additional predictor of older workers' health. Scholars have called for more research on this topic because health is an important factor that promotes successful aging at work (Truxillo et al., 2015). Adding to the stream of research showing that work-related factors influence older workers' health (e.g., workplace age discrimination, job demands, job strains; Mutambudzi & Javed, 2016; von Hippel, Kalokerinos, & Henry, 2013), we demonstrate that the nexus between work and family affects older workers' health. By documenting health implications of work-family interface among mature employees, our study also expands the work-family literature that has primarily focused on young and mid-aged adults. Our findings reveal similarities (e.g., WTFC reciprocally relates to health) as well as differences (e.g., FTWC, WTFE, and FTWE did not relate to health) across the two populations in terms of the way work-family experiences relates to health and invite further research to better understand factors driving the differences.

The present study offers several practical implications as well. Because work-family experiences are potentially modifiable experiences (Allen & Shockley, 2012), knowledge generated from this study could support the on-going efforts to create a healthier workplace for the growing number of older workers (e.g., Griffiths, 2000; Poscia et al., 2016). Considering that the rare experience of WTFC still had a significant relationship with both comorbidity and disability, organizations are advised to design and provide interventions to help older workers reduce WTFC. Previous research indicates that older workers favor flexible work arrangements (Allen & Shockley, 2012), which are helpful in reducing WFC (Allen, Johnson, Kiburz, & Shockley, 2013). Also, work support in general particularly family-supportive supervisor behavior, is known to alleviate WFC (Kossek, Pichler, Bodner, & Hammer, 2011). Therefore, organizations may want to consider training supervisors to be more family-supportive (Hammer,

Kossek, Anger, Bodner, & Zimmerman, 2011) to help older workers to achieve desired work-family interface. Lastly, health promotion programs (e.g., lifestyle intervention, Tai Chi; Palumbo, Wu, Shaner-McRae, Rambur, & McIntosh, 2012; Strijk, Proper, van der Beek, & Van Mechelen, 2012) could serve dual purposes of enhancing health and reducing WTFC for older workers, because healthier workers experienced less WTFC.

Limitations and Future Research Directions

Limitations of this study deserve mention. First, we used self-reported survey data on comorbidity and disability as outcome variables. However, these physical and functional health measures in the HRS have been shown to be valid (Wallace & Herzog, 1995). Furthermore, previous research has shown that these self-reported measures are associated with actual diagnosis and performance (Bush et al., 1989; Haapanen et al., 1997; Reuben et al., 1995). Nevertheless, future studies would benefit from utilizing objective measures of older workers' health (e.g., blood pressure, heart rate) or multi-source data (e.g., spouse report of work-family experiences). Second limitation concerns the measurement of work-family experiences. The reliability of WTFC and FTWC measures at some waves was lower than the conventional threshold of .70 (Nunnally, 1973). Given that the items for WTFC and FTWC were similar to existing work-family measures in terms of contents (e.g., Netemeyer, Boles, & McMurrian, 1996), we are unsure of the source of low reliability. Of note, reliabilities of WTFC and FTWC measures based on the entire sample were similar to those in our study (Smith et al., 2013). Because we used archival data, our ability to choose measurements was limited; we believe the advantage of the longitudinal nature of the archival data outweighs this weakness.

The findings of this study provide several fruitful avenues for future research. First, future research is needed to understand the mechanism by which WTFC relates to older workers'

health. Previous research found that health behaviors (e.g., diet, exercise) are key determinants of health among older adults (Hamer & Chida, 2008; Mente, de Koning, Shannon, & Anand, 2009), and WTFC is an antecedent of various health behaviors (Allen & Armstrong, 2006). Also, psychosocial work conditions (e.g., job demands) that are predictors of WTFC (Parasuraman, Greenhaus, & Granrose, 1992) have been shown to relate to leisure-time physical activity (Choi et al., 2010). These findings suggest that stressful work characteristics and WTFC might trigger certain behaviors that affect physical and functional health among older workers.

Another promising topic for future research is moderators of the link between work-family experiences and health among older workers. Although the current work-family literature suggests that various work- (e.g., working hours; Amstad et al., 2011) and family- (e.g., number of dependent children; Zhang, Xu, Jin, & Ford, 2018) factors qualify the impact of work-family experiences on health, the findings may not replicate in the senior population, considering different work and family circumstances older workers face. For instance, part-time employment is more common among older workers than younger workers (Visser, Gesthuizen, Kraaykamp, & Wolbers, 2017), and older workers usually do not cohabitate with young dependent children. In sum, building on the current study, more research is warranted to better understand *to whom* and *when* the work-family experiences exert impact on older workers' health.

Next, future research may also want to investigate job-relevant disability as an outcome to understand health implication of work-family experiences in the workplace. According to the International Classification of Functioning, Disability, and Health (World Health Organization, 2001), disability stems from a poor person-environment fit, such that individuals become disabled because reduced ability or capacity is unable to meet the environmental demands. Although the current study demonstrated that WTFC can lead to disability in personal

environments among older workers, such disability may not necessarily translate to disability in work environments. For instance, an older worker may have difficulty with preparing meal at home but not in the workplace because company serves prepared meal. Hence, further investigation is warranted on whether and how work-family experiences relate to job-relevant disability.

Finally, we call for more research on work-family experiences among older workers. As a beginning, whether and how older workers' work-family experiences are qualitatively different from those of their younger counterparts deserve further attention. For example, investigating the work-*nonwork* interface (Fisher, Bulger, & Smith, 2009) or the work-*self* interface (Demerouti, Shimazu, Bakker, Shimada, & Kawakami, 2013) might be more applicable among older workers because they may have different types of responsibilities and resources compared to young and mid-aged workers. Relatedly, a measure that captures the potentially different work-family experiences among older workers may be necessary if the current WFC and WFE measures appear inadequate for older workers. Second, continued monitoring of work-family experiences among older workers is needed. Although the degree of family demands has been thought to be at its lowest in late adulthood (Bengtson & Allen, 1993), a number of recent trends suggest that such assumption might not hold true anymore. For example, an increased number of unemployed adult children are moving back to their parents' house (Wang, Morin, & Pew Research Center, 2009), and older workers are more likely to become caregivers for aging parents and partners (Neal & Hammer, 2007). Scholars claimed that adding a new stage to the life stages model might be in order due to the changing work-family circumstances for older workers (Thrasher et al., 2016). Future empirical work may want to examine whether and how these changing family structure influence the trajectories of work-family experiences among older workers.

Conclusion

This study advances the literature by examining the impacts work-family experiences on health among older workers. The results showed that WTFC reciprocally related to older workers' comorbidity and disability; WTFC leads to more health problems and functional limitations, and those with more health issues can experience more WTFC. Using five waves of longitudinal data from a nationally representative sample, our research showed that negative work-family experience significantly associates with older workers' health, which likely develops into a vicious cycle in this population.

References

Allen, T. D. (2012). The work-family interface. In S. W. J. Kozlowski (Ed.), *The Oxford handbook of organizational psychology* (pp. 1163-1198). New York: Oxford University Press.

Allen, T. D., & Armstrong, J. (2006). Further examination of the link between work-family conflict and physical health: The role of health-related behaviors. *American Behavioral Scientist, 49*, 1204-1221. doi:10.1177/0002764206286386

Allen, T. D., & Finkelstein, L. M. (2014). Work–family conflict among members of full-time dual-earner couples: An examination of family life stage, gender, and age. *Journal of Occupational Health Psychology, 19*, 376-384. doi:10.1037/a0036941

Allen, T. D., Johnson, R. C., Kiburz, K. M., & Shockley, K. M. (2013). Work–family conflict and flexible work arrangements: Deconstructing flexibility. *Personnel Psychology, 66*, 345-376. doi:10.1111/peps.12012

Allen, T. D., & Shockley, K. M. (2012). Older workers and work-family issues. In J. W. Hedge & W. C. Borman (Eds.), *The Oxford handbook of work and aging* (pp. 520-537): Oxford University Press.

Amstad, F. T., Meier, L. L., Fasel, U., Elfering, A., & Semmer, N. K. (2011). A meta-analysis of work–family conflict and various outcomes with a special emphasis on cross-domain versus matching-domain relations. *Journal of Occupational Health Psychology, 16*, 151-169. doi:10.1037/a0022170

Baltes, B. B., & Young, L. M. (2007). Aging and work/family issues. In K. S. Shultz & G. A. Adams (Eds.), *Aging and work in the 21st century* (pp. 251-275). Mahwah, New Jersey: Psychology Press.

Bellavia, G., & Frone, M. R. (2005). Work-family conflict. In J. Barling, E. K. Kelloway, & M.

R. Frone (Eds.), *Handbook of work stress*. Thousand Oaks, CA: Sage.

Bengtson, V. L., & Allen, K. R. (1993). The life course perspective applied to families over time. In P. Boss, W. J. Doherty, R. LaRossa, W. R. Schumm, & S. K. Steinmetz (Eds.), *Sourcebook of family theories and methods: A contextual approach* (pp. 469-504). New York, NY: Springer.

Burniaux, J.-M., Duval, R., & Jaumotte, F. (2004). Coping with ageing: A dynamic approach to quantify the impact of alternative policy options on future labour supply in OECD countries. *OECD Economics Department Working Papers, No. 371*. doi:10.1787/224538175006

Bush, T. L., Miller, S. R., Golden, A. L., & Hale, W. E. (1989). Self-report and medical record report agreement of selected medical conditions in the elderly. *American Journal of Public Health, 79*, 1554-1556. doi:10.2105/ajph.79.11.1554

Cai, L., & Kalb, G. (2006). Health status and labour force participation: Evidence from Australia. *Health economics, 15*, 241-261.

Carrière, Y., & Galarneau, D. (2011). Delayed retirement: A new trend? *Perspectives on Labour and Income, 23*, 4-16.

CDC National Center for Chronic Disease Prevention and Health Promotion. (2012). Older employees in the workplace (Issue Brief No. 1, July 2012). Retrieved from https://www.cdc.gov/workplacehealthpromotion/tools-resources/pdfs/Issue_Brief_No_1_Older_Employees_in_the_Workplace_7-12-2012_FINAL508_1.pdf

Chatterji, S., Byles, J., Cutler, D., Seeman, T., & Verdes, E. (2015). Health, functioning and disability in older adults – current status and future implications. *The Lancet, 385*, 563-

575. doi:10.1016/S0140-6736(14)61462-8

Cho, E., & Tay, L. (2015). Domain satisfaction as a mediator of the relationship between work–family spillover and subjective well-being: A longitudinal study. *Journal of Business and Psychology, 31*, 445–457. doi:10.1007/s10869-015-9423-8

Choi, B., Schnall, P., Yang, H., Dobson, M., Landsbergis, P., Israel, L., . . . Baker, D. (2010). Psychosocial working conditions and active leisure-time physical activity in middle-aged US workers. *International Journal of Occupational Medicine and Environmental Health, 23*, 239-253.

Cronin-Stubbs, D., De Leon, C. F. M., Beckett, L. A., Field, T. S., Glynn, R. J., & Evans, D. A. (2000). Six-year effect of depressive symptoms on the course of physical disability in community-living older adults. *Archives of internal medicine, 160*, 3074-3080.

Darcy, C., McCarthy, A., Hill, J., & Grady, G. (2012). Work–life balance: One size fits all? An exploratory analysis of the differential effects of career stage. *European Management Journal, 30*, 111-120.

Demerouti, E., Shimazu, A., Bakker, A. B., Shimada, K., & Kawakami, N. (2013). Work-self balance: A longitudinal study on the effects of job demands and resources on personal functioning in Japanese working parents. *Work & Stress, 27*, 223-243. doi:10.1080/02678373.2013.812353

Fisher, G. G., Bulger, C. A., & Smith, C. S. (2009). Beyond work and family: A measure of work/nonwork interference and enhancement. *Journal of Occupational Health Psychology, 14*, 441-456. doi:10.1037/a0016737

Frone, M. R., Russel, M., & Cooper, M. L. (1997). Relation of work+family conflict to health outcomes: A four-year longitudinal study of employed parents. *Journal of Occupational*

& Organizational Psychology, 70, 325-335.

Frone, M. R., Russell, M., & Barnes, G. M. (1996). Work–family conflict, gender, and health-related outcomes: A study of employed parents in two community samples. *Journal of Occupational Health Psychology, 1*, 57-69. doi:10.1037/1076-8998.1.1.57

Frone, M. R., Russell, M., & Cooper, M. L. (1992). Antecedents and outcomes of work-family conflict: Testing a model of the work-family interface. *Journal of Applied Psychology, 77*, 65.

Graham, J. W. (2012). *Missing data: Analysis and design*. New York: Springer Science & Business Media.

Grandey, A. A., & Cropanzano, R. (1999). The conservation of resources model applied to work–family conflict and strain. *Journal of Vocational Behavior, 54*, 350-370. doi:10.1006/jvbe.1998.1666

Greenhaus, J. H., & Powell, G. N. (2006). When work and family are allies: A theory of work-family enrichment. *Academy of Management Review, 31*, 72-92. doi:10.5465/amr.2006.19379625

Griffiths, A. (2000). Designing and managing healthy work for older workers. *Occupational medicine, 50*, 473-477. doi:10.1093/occmed/50.7.473

Grzywacz, J. G., Almeida, D. M., & McDonald, D. A. (2002). Work–family spillover and daily reports of work and family stress in the adult labor force. *Family Relations, 51*, 28-36. doi:10.1111/j.1741-3729.2002.00028.x

Grzywacz, J. G., & Bass, B. L. (2003). Work, family, and mental health: Testing different models of work-family fit. *Journal of Marriage and Family, 65*, 248-261. doi:10.1111/j.1741-3737.2003.00248.x

Haapanen, N., Miilunpalo, S., Pasanen, M., Oja, P., & Vuori, I. (1997). Agreement between questionnaire data and medical records of chronic diseases in middle-aged and elderly Finnish men and women. *American Journal of Epidemiology, 145*, 762-769.

Hakanen, J. J., Peeters, M. C. W., & Perhoniemi, R. (2011). Enrichment processes and gain spirals at work and at home: A 3-year cross-lagged panel study. *Journal of Occupational and Organizational Psychology, 84*, 8-30. doi:10.1111/j.2044-8325.2010.02014.x

Hamer, M., & Chida, Y. (2008). Walking and primary prevention: A meta-analysis of prospective cohort studies. *British Journal of Sports Medicine, 42*, 238-243. doi:10.1136/bjsm.2007.039974

Hammer, L. B., Kossek, E. E., Anger, W. K., Bodner, T., & Zimmerman, K. L. (2011). Clarifying work–family intervention processes: The roles of work–family conflict and family-supportive supervisor behaviors. *Journal of Applied Psychology, 96*, 134. doi:134–150. doi:10.1037/a0020927

He, W., & Larsen, L. J. (2014). Older Americans with a disability, 2008-2012. Retrieved from http://tilrc.org/assests/news/publications/older_americans_with_a_disability12_2014.pdf

Hicks, P. (2011). The surprisingly large policy implications of changing retirement durations. *SEDAP Research Paper, No. 284*.

Hobfoll, S. E. (2001). The influence of culture, community, and the nested-self in the stress process: Advancing conservation of resources theory. *Applied psychology, 50*, 337-421.

Huffman, A., Culbertson, S. S., Henning, J. B., & Goh, A. (2013). Work-family conflict across the lifespan. *Journal of Managerial Psychology, 28*, 761-780.

Janke, M. C., Chen, T.-Y., & Young, T. L. (2015). Disablement. In S. K. Whitbourne (Ed.), *The Encyclopedia of Adulthood and Aging* (pp. 350-353). Malden, MA: Wiley Blackwell.

Jason, K. J., Carr, D. C., Washington, T. R., Hilliard, T. S., & Mingo, C. A. (2017). Multiple chronic conditions, resilience, and workforce transitions in later life: A socio-ecological model. *The Gerontologist, 57*, 269-281.

Johnson, R. W. (2004). Trends in job demands among older workers, 1992-2002. *Monthly Labor Review, 127*, 48.

Jopp, D., & Smith, J. (2006). Resources and life-management strategies as determinants of successful aging: On the protective effect of selection, optimization, and compensation. *Psychology and aging, 21*, 253. doi:10.1037/0882-7974.21.2.253

Kahn, J. R., & Pearlin, L. I. (2006). Financial strain over the life course and health among older adults. *Journal of Health and Social Behavior, 47*, 17-31. doi:10.1177/002214650604700102

Kharicha, K., Iliffe, S., Harari, D., Swift, C., Gillmann, G., & Stuck, A. E. (2007). Health risk appraisal in older people 1: Are older people living alone an 'at-risk' group? *The British Journal of General Practice, 57*, 271-276.

Kossek, E. E., Pichler, S., Bodner, T., & Hammer, L. B. (2011). Workplace social support and work–family conflict: A meta-analysis clarifying the influence of general and work–family-specific supervisor and organizational support. *Personnel psychology, 64*, 289-313. doi:10.1111/j.1744-6570.2011.01211.x

Krieger, N., Chen, J. T., Waterman, P. D., Rehkopf, D. H., & Subramanian, S. V. (2003). Race/ethnicity, gender, and monitoring socioeconomic gradients in health: A comparison of area-based socioeconomic measures—The Public Health Disparities Geocoding Project. *American Journal of Public Health, 93*, 1655-1671. doi:10.2105/ajph.93.10.1655

MacDermid, S. M., Barnett, R., Crosby, F., Greenhaus, J., Koblenz, M., Marks, S., . . . Sabbatini-

Bunch, L. (2000). *The measurement of work/life tension: Recommendations of a virtual think tank.* Boston: Alfred P. Sloan Foundation.

McNall, L. A., Nicklin, J. M., & Masuda, A. D. (2010). A meta-analytic review of the consequences associated with work–family enrichment. *Journal of Business and Psychology, 25*, 381-396. doi:10.1007/s10869-009-9141-1

Mente, A., de Koning, L., Shannon, H. S., & Anand, S. S. (2009). A systematic review of the evidence supporting a causal link between dietary factors and coronary heart disease. *Archives of internal medicine, 169*, 659-669. doi:10.1001/archinternmed.2009.38

Mutambudzi, M., & Javed, Z. (2016). Job strain as a risk factor for incident diabetes mellitus in middle and older age US workers. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 71*, 1089-1096. doi:10.1093/geronb/gbw091

Neal, M. B., & Hammer, L. B. (2007). *Working couples caring for children and aging parents: Effects on work and well-being* Mahwah, NJ: Lawrence Erlbaum Associates.

Netemeyer, R. G., Boles, J. S., & McMurrian, R. (1996). Development and validation of work-family conflict and family-work conflict scales. *Journal of Applied Psychology, 81*, 400-410.

Ng, T. W., & Feldman, D. C. (2013). Employee age and health. *Journal of Vocational Behavior, 83*, 336-345. doi:10.1016/j.jvb.2013.06.004

Noh, J., Kim, H. C., Shin, A., Yeom, H., Jang, S.-Y., Lee, J. H., . . . Suh, I. (2016). Prevalence of comorbidity among people with hypertension: The Korea National Health and Nutrition Examination Survey 2007-2013. *Korean Circulation Journal, 46*, 672-680. doi:10.4070/kcj.2016.46.5.672

Nohe, C., Meier, L. L., Sonntag, K., & Michel, A. (2015). The chicken or the egg? A meta-

analysis of panel studies of the relationship between work–family conflict and strain. *Journal of Applied Psychology, 100*, 522-536.

Nunnally, J. C. (1973). Research strategies and measurement methods for investigating human development. In J. R. Nesselroade & H. W. Reese (Eds.), *Life-span developmental psychology: Methodological issues*. Oxford, England: Academic Press.

Oslin, D. W. (2000). Alcohol use in late life: Disability and comorbidity. *Journal of Geriatric Psychiatry and Neurology, 13*, 134-140. doi:10.1177/089198870001300307

Palumbo, M. V., Wu, G., Shaner-McRae, H., Rambur, B., & McIntosh, B. (2012). Tai Chi for older nurses: A workplace wellness pilot study. *Applied Nursing Research, 25*, 54-59.

Parasuraman, S., Greenhaus, J. H., & Granrose, C. S. (1992). Role stressors, social support, and well-being among two-career couples. *Journal of Organizational behavior, 13*, 339-356.

Phillips, D. R., & Siu, O.-L. (2012). Global aging and aging workers. In J. W. Hedge & W. C. Borman (Eds.), *The Oxford handbook of work and aging*: Oxford University Press.

Pingle, J. F. (October 2006). *Social security's delayed retirement credit and the labor supply of older men*. Retrieved from https://ssrn.com/abstract=951209

Poscia, A., Moscato, U., La Milia, D. I., Milovanovic, S., Stojanovic, J., Borghini, A., . . . Magnavita, N. (2016). Workplace health promotion for older workers: A systematic literature review. *BMC health services research, 16*, 415-428. doi:10.1186/s12913-016-1518-z

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models* (2nd ed.). Thound Oaks, CA: SAGE.

Reuben, D. B., Valle, L. A., Hays, R. D., & Siu, A. L. (1995). Measuring physical function in community-dwelling older persons: A comparison of self-administered,

interviewer-administered, and performance-based measures. *Journal of the American Geriatrics Society, 43*, 17-23.

Rosenthal, L., Carroll-Scott, A., Earnshaw, V. A., Santilli, A., & Ickovics, J. R. (2012). The importance of full-time work for urban adults' mental and physical health. *Social Science & Medicine, 75*, 1692-1696. doi:https://doi.org/10.1016/j.socscimed.2012.07.003

Rudolph, C. W., Baltes, B. B., & Zabel, K. L. (2013). Older employees' motivation for working. In C. L. Cooper, R. J. Burke, & J. Field (Eds.), *Handbook on aging, work, and society*. London, UK: Sage Publications.

Salomon, J. A., Wang, H., Freeman, M. K., Vos, T., Flaxman, A. D., Lopez, A. D., & Murray, C. J. L. (2012). Healthy life expectancy for 187 countries, 1990-2010: A systematic analysis for the Global Burden Disease Study 2010. *The Lancet, 380*, 2144-2162. doi:10.1016/S0140-6736(12)61690-0

Schnittker, J. (2005). When mental health becomes health: Age and the shifting meaning of self-evaluations of general health. *The Milbank Quarterly, 83*, 397-423. doi:10.1111/j.1468-0009.2005.00407.x

Smith, J., Fisher, G., Ryan, L., Clarke, P., House, J., & Weir, D. (2013). Psychosocial and lifestyle questionnaire 2006-2010: Documentation report core section LB. Retrieved from http://hrsonline.isr.umich.edu/sitedocs/userg/HRS2006-2010SAQdoc.pdf

Smyer, M., & Pitt-Catsouphes, M. (2007). The meanings of work for older workers. *Generations, 31*, 23-30.

Snijders, T. A., & Bosker, R. J. (1994). Modeled variance in two-level models. *Sociological methods & research, 22*, 342-363.

Sonnega, A., Faul, J. D., Ofstedal, M. B., Langa, K. M., Phillips, J. W. R., & Weir, D. R. (2014).

Cohort Profile: The Health and Retirement Study (HRS). *International Journal of Epidemiology, 43*, 576-585. doi:10.1093/ije/dyu067

Strijk, J. E., Proper, K. I., van der Beek, A. J., & Van Mechelen, W. (2012). A worksite vitality intervention to improve older workers' lifestyle and vitality-related outcomes: Results of a randomised controlled trial. *Journal of Epidemiology & Community Health, 66*, 1071-1078.

Taylor, M. A., & Shore, L. M. (1995). Predictors of planned retirement age: An application of Beehr's model. *Psychology and aging, 10*, 76. doi:10.1037/0882-7974.10.1.76

ten Brummelhuis, L. L., & Bakker, A. B. (2012). A resource perspective on the work–home interface: The work–home resources model. *American Psychologist, 67*, 545.

Thomas, L. T., & Ganster, D. C. (1995). Impact of family-supportive work variables on work-family conflict and strain: A control perspective. *Journal of Applied Psychology, 80*, 6-15. doi:10.1037/0021-9010.80.1.6

Thrasher, G. R., Zabel, K., Wynne, K., & Baltes, B. B. (2016). The importance of workplace motives in understanding work–family issues for older workers. *Work, Aging and Retirement, 2*, 1-11. doi:10.1093/workar/wav021

Truxillo, D. M., Cadiz, D. M., & Hammer, L. B. (2015). Supporting the aging workforce: A review and recommendations for workplace intervention research. *Annual Review of Organizational Psychology and Organizational Behavior, 2*, 351-381. doi:10.1146/annurev-orgpsych-032414-111435

Turvey, C. L., Wallace, R. B., & Herzog, R. (2005). A revised CES-D measure of depressive symptoms and a DSM-based measure of major depressive episodes in the elderly. *International Psychogeriatrics, 11*, 139-148. doi:10.1017/S1041610299005694

Urry, H. L., & Gross, J. J. (2010). Emotion regulation in older age. *Current Directions in Psychological Science, 19*, 352–357.

van Rijn, R. M., Robroek, S. J. W., Brouwer, S., & Burdorf, A. (2014). Influence of poor health on exit from paid employment: A systematic review. *Occupational and Environmental Medicine, 71*, 295-301. doi:10.1136/oemed-2013-101591

van Steenbergen, E. F., & Ellemers, N. (2009). Is managing the work–family interface worthwhile? Benefits for employee health and performance. *Journal of Organizational Behavior, 30*, 617-642.

Verbrugge, L. M. (1989). Recent, present, and future health of American adults. *Annual review of public health, 10*, 333-361.

Verbrugge, L. M., Gates, D. M., & Ike, R. W. (1991). Risk factors for disability among US adults with arthritis. *Journal of Clinical Epidemiology, 44*, 167-182.

Visser, M., Gesthuizen, M., Kraaykamp, G., & Wolbers, M. H. (2017). Labor market vulnerability of older workers in the Netherlands and its impact on downward mobility and reduction of working hours. *Work, Aging and Retirement*. doi:10.1093/workar/wax017

von Hippel, C., Kalokerinos, E. K., & Henry, J. D. (2013). Stereotype threat among older employees: Relationship with job attitudes and turnover intentions. *Psychology and aging, 28*, 17-27. doi:10.1037/a0029825

Wallace, R. B., & Herzog, A. R. (1995). Overview of the health measures in the Health and Retirement Study. *Journal of Human Resources*, S84-S107.

Wang, W., Morin, R., & Pew Research Center. (2009). Home for the holidays...and every other day. Retrieved from http://www.pewsocialtrends.org/files/2010/10/home-for-the-holidays.pdf

Wayne, J. H., Grzywacz, J. G., Carlson, D. S., & Kacmar, K. M. (2007). Work–family facilitation: A theoretical explanation and model of primary antecedents and consequences. *Human Resource Management Review, 17*, 63-76. doi:10.1016/j.hrmr.2007.01.002

Wolff, J. L., Starfield, B., & Anderson, G. (2002). Prevalence, expenditures, and complications of multiple chronic conditions in the elderly. *Archives of internal medicine, 162*, 2269-2276. doi:10.1001/archinte.162.20.2269

World Health Organization. (2001). *International classification of functioning, disability and health: ICF*: Geneva: World Health Organization.

Zhang, Y., Xu, S., Jin, J., & Ford, M. T. (2018). The within and cross domain effects of work-family enrichment: A meta-analysis. *Journal of Vocational Behavior, 104*, 210-227. doi:10.1016/j.jvb.2017.11.003

Table 1.
Measure for Work-Family Experiences

Variables	Items
Work-to-family enrichment	My work left me enough time to attend to my personal responsibilities. My work gave me energy to do things with my family and other important people in my life. Because of my job, I was in a better mood at home.
Work-to-family conflict	My work schedule makes it difficult to fulfill personal responsibilities. Because of my job, I didn't have the energy to do things with my family or other important people in my life. Job worries or problems distract me when I am not at work.
Family-to-work enrichment	My personal responsibilities left me enough time to do my job. My family or personal life gave me energy to do my job. I was in a better mood at work because of my family or personal life.
Family-to-work conflict	My home life kept me from getting work done on time on my job. My family or personal life drained me of the energy I needed to do my job. I was preoccupied with personal responsibilities while I was at work.

Table 2.
Descriptive Statistics of All Study Variables (*n* = 4509)

Variables	*M* (*SD*) or N (%)	Variables	*M* (*SD*) or N (%)
Age at 2006(*n* = 4509)	62.96 (6.49)	Income at 2010	
Sex: Female	2306 (51%)	$0-$10,000	232 (6%)
Race: White	3606 (80%)	$10,001-$20,000	433 (11%)
Education (years)	13.35 (2.87)	$20,001-$35,000	708 (18%)
Living alone (yes)		$35,001-$50,000	555 (14%)
Wave 2006	1073 (26%)	$50,001-$75,000	644 (16%)
Wave 2008	1154 (28%)	$75,001-$100,000	472 (12%)
Wave 2010	1285 (30%)	$100,001-$150,000	498 (12%)
Wave 2012	1295 (32%)	> $150,000	455 (11%)
Wave 2014	1330 (34%)	Income at 2012	
Married (yes)		$0-$10,000	263 (7%)
Wave 2006	2853 (70%)	$10,001-$20,000	503 (13%)
Wave 2008	2815 (69%)	$20,001-$35,000	749 (19%)
Wave 2010	2800 (66%)	$35,001-$50,000	540 (14%)
Wave 2012	2631 (65%)	$50,001-$75,000	602 (16%)
Wave 2014	2398 (62%)	$75,001-$100,000	390 (10%)
Income at 2006		$100,001-$150,000	402 (10%)
$0-$10,000	178 (5%)	> $150,000	440 (11%)
$10,001-$20,000	359 (9%)	Income at 2014	
$20,001-$35,000	569 (15%)	$0-$10,000	245 (7%)
$35,001-$50,000	533 (14%)	$10,001-$20,000	525 (14%)
$50,001-$75,000	742 (19%)	$20,001-$35,000	719 (19%)
$75,001-$100,000	489 (13%)	$35,001-$50,000	495 (13%)
$100,001-$150,000	493 (13%)	$50,001-$75,000	609 (16%)
> $150,000	471 (12%)	$75,001-$100,000	388 (10%)
Income at 2008		$100,001-$150,000	377 (10%)
$0-$10,000	177 (4%)	> $150,000	395 (11%)
$10,001-$20,000	332 (9%)		
$20,001-$35,000	591 (15%)		
$35,001-$50,000	526 (14%)		
$50,001-$75,000	730 (19%)		
$75,001-$100,000	474 (12%)		
$100,001-$150,000	482 (13%)		
> $150,000	524 (14%)		

Table 2. (continued)
Descriptive Statistics of All Study Variables (n = 4509)

Variables	*M* (*SD*) or *N* (%)	Variables	*M* (*SD*) or *N* (%)
Employment status		Family-to-work conflict	
Work in wave 2006	3738 (92%)	Wave 2006 (n = 2009)	1.16 (.32)
Full-time (yes)	2078 (57%)†	Wave 2008 (n = 1619)	1.17 (.34)
Part-time (yes)	1533 (43%)†	Wave 2010 (n = 1391)	1.15 (.32)
Work in wave 2008	3560 (87%)	Wave 2012 (n = 973)	1.16 (.33)
Full-time (yes)	1903 (55%)†	Wave 2014 (n = 893)	1.16 (.34)
Part-time (yes)	1541 (45%)†	Depressive symptoms	
Work in wave 2010	3049 (73%)	Wave 2006 (n = 3934)	1.07 (1.69)
Full-time (yes)	1457 (50%)†	Wave 2008 (n = 3947)	1.05 (1.68)
Part-time (yes)	1489 (50%)†	Wave 2010 (n = 4065)	1.03 (1.69)
Work in wave 2012	2581 (63%)	Wave 2012 (n = 3946)	1.05 (1.68)
Full-time (yes)	1160 (47%)†	Wave 2014 (n = 3751)	1.08 (1.72)
Part-time (yes)	1316 (53%)†	Comorbidity	
Work in wave 2014	2035 (53%)	Wave 2006 (n = 4068)	1.60 (1.24)
Full-time (yes)	815 (42%)†	Wave 2008 (n = 4082)	1.76 (1.28)
Part-time (yes)	1130 (58%)†	Wave 2010 (n = 4211)	1.93 (1.34)
Work-to-family enrichment		Wave 2012 (n = 4083)	2.05 (1.37)
Wave 2006 (n = 2007)	2.85 (.89)	Wave 2014 (n = 3865)	2.15 (1.40)
Wave 2008 (n = 1618)	2.92 (.88)	Disability	
Wave 2010 (n = 1391)	2.90 (.86)	Wave 2006 (n = 4069)	.21 (.68)
Wave 2012 (n = 973)	2.94 (.87)	Wave 2008 (n = 4082)	.25 (.80)
Wave 2014 (n = 892)	2.96 (.84)	Wave 2010 (n = 4206)	.35 (1.03)
Family-to-work enrichment		Wave 2012 (n = 4081)	.39 (1.16)
Wave 2006 (n = 2001)	3.23 (.80)	Wave 2014 (n = 3866)	.48 (1.31)
Wave 2008 (n = 1618)	3.26 (.80)		
Wave 2010 (n = 1392)	3.22 (.81)		
Wave 2012 (n = 972)	3.25 (.80)		
Wave 2014 (n = 891)	3.25 (.78)		
Work-to-family conflict			
Wave 2006 (n = 2014)	1.52 (.54)		
Wave 2008 (n = 1623)	1.53 (.58)		
Wave 2010 (n = 434)	1.49 (.53)		
Wave 2012 (n = 1392)	1.47 (.54)		
Wave 2014 (n = 893)	1.46 (.55)		

Note. †In 2006, 127 individuals did not have information on employment status, this number was 116 in 2008, 103 in 2010, 105 in 2012, and 90 in 2014. The percentage was calculated based on only available data.

Table 3.
Summary of Multilevel Models Examining the Effects of Work-Family Experiences on Comorbidity

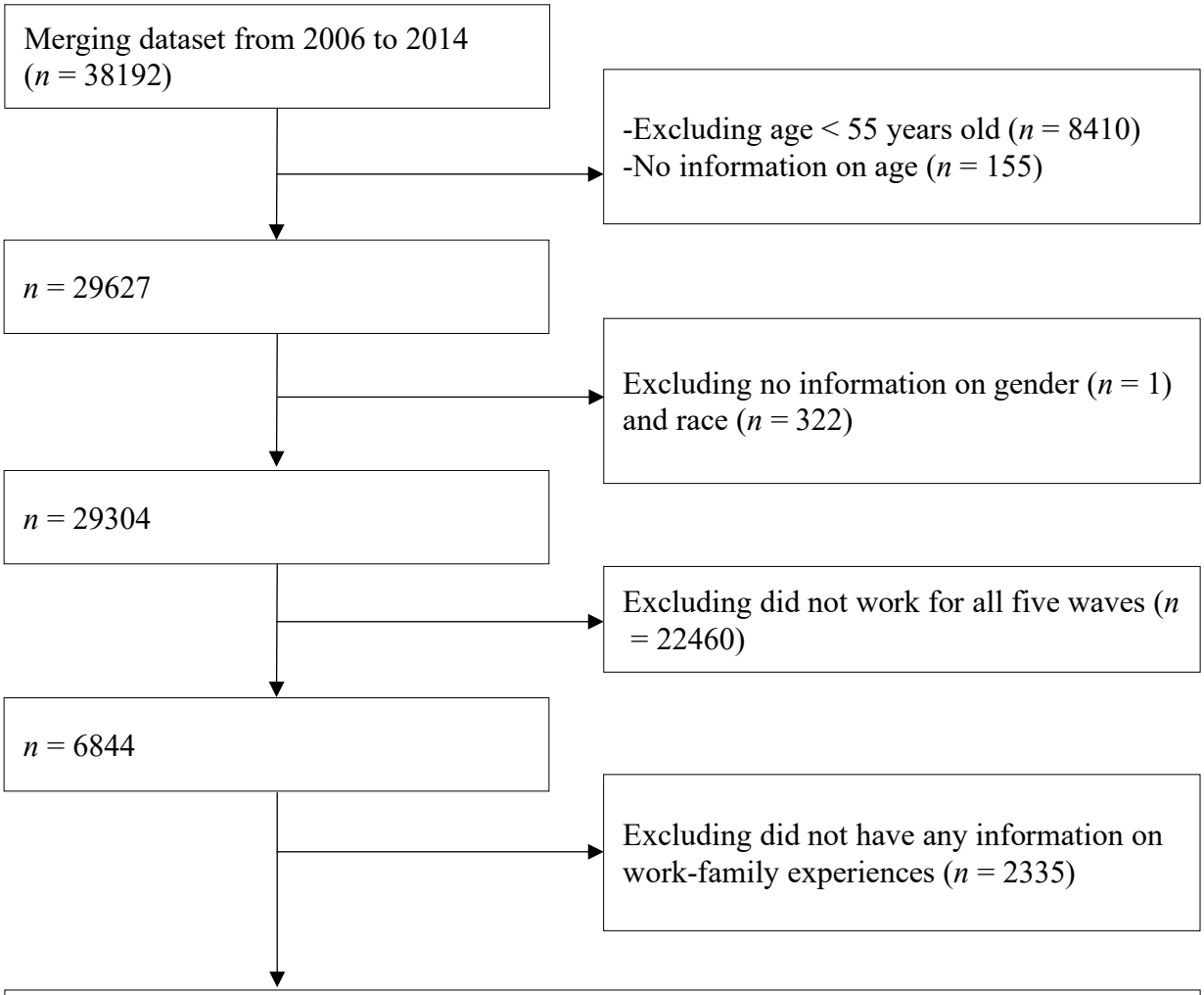
	Comorbidity		
	Model 1	Model 2	Model 3
	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)
Fixed Effects			
Level 2 (Initial status)			
Intercept; γ_{00}	1.89 (.02)***	1.58 (.02)***	1.64 (.09)***
Age at baseline: years; γ_{01}			.04 (.003)***
Sex: Female; γ_{02}			.06 (.04)
Education: years; γ_{03}			-.03 (.01)***
Race: White; γ_{04}			.10 (.05)
Level 1 (Rate of change)			
Time; γ_{10}		.08 (.002)***	.07 (.004)***
Depressive symptoms: 0-8; γ_{20}			.06 (.01)***
Living alone: yes; γ_{30}			.01 (.07)
Married: yes; γ_{40}			-.004 (.07)
Income group: 1-8; γ_{50}			-.02 (.01)**
Work-to-family enrichment: 1-4; γ_{60}			-.03 (.02)
Work-to-family conflict: 1-4; γ_{70}			.08 (.03)**
Family-to-work enrichment: 1-4; γ_{80}			-.02 (.02)
Family-to-work conflict: 1-4; γ_{90}			-.04 (.04)
Employment Status: Full-time; γ_{10}			-.06 (.03)*
Variance Components			
Intercept; τ_{00}	1.43 (1.20)***	1.50 (1.22)***	1.24 (1.11)***
Slope: Time; τ_{11}		.01 (.11)***	.01 (.09)***
Residual; σ^2	.37 (.61)	.19 (.44)	.20 (.44)
Parameter	3	6	19
Deviance (-2LL)	50594.28	45239.90	17167.10
AIC	50600.28	45251.90	17205.10

Note. Bolded and italic variables were grand mean centered.
*p< .05 **p< .01 ***p< .001

Table 4
Summary of Multilevel Models Examining the Effects of Work-Family Experiences on Disability

	Disability		
	Model 1	Model 2	Model 3
	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)
Fixed Effects			
Level 2 (Initial status)			
Intercept; γ_{00}	.34 (.01)***	.18 (.01)***	.33 (.05)***
Age at baseline: years; γ_{01}			.004 (.002)*
Sex: Female; γ_{02}			.04 (.02)*
Education: years; γ_{03}			-.03 (.004)***
Race: White; γ_{04}			-.06 (.03)*
Level 1 (Rate of change)			
Time; γ_{10}		.04 (.003)***	.01 (.002)***
Depressive symptoms: 0-8; γ_{20}			.08 (.01)***
Living alone: yes; γ_{30}			-.01 (.005)
Married: yes; γ_{40}			-.01 (.04)
Income group: 1-8; γ_{50}			-.01 (.005)*
Work-to-family enrichment: 1-4; γ_{60}			.01 (.01)
Work-to-family conflict: 1-4; γ_{70}			.08 (.02)***
Family-to-work enrichment: 1-4; γ_{80}			.007 (.01)
Family-to-work conflict: 1-4; γ_{90}			-.003 (.03)
Employment Status: Full-time; γ_{10}			-.05 (.02)*
Variance Components			
Intercept; τ_{00}	.48 (.69)***	.15 (.38)***	.22 (.47)***
Slope: Time; τ_{11}		.01 (.12)***	<.001 (.02)
Residual; σ^2	.58 (.76)	.43 (.66)	.18 (.42)
Parameter	3	6	19
Deviance (-2LL)	53508.14	50461.73	10670.96
AIC	53514.14	50473.73	10708.96

Note. Bolded and italic variables were grand mean centered.
*p< .05 **p< .01 ***p< .001



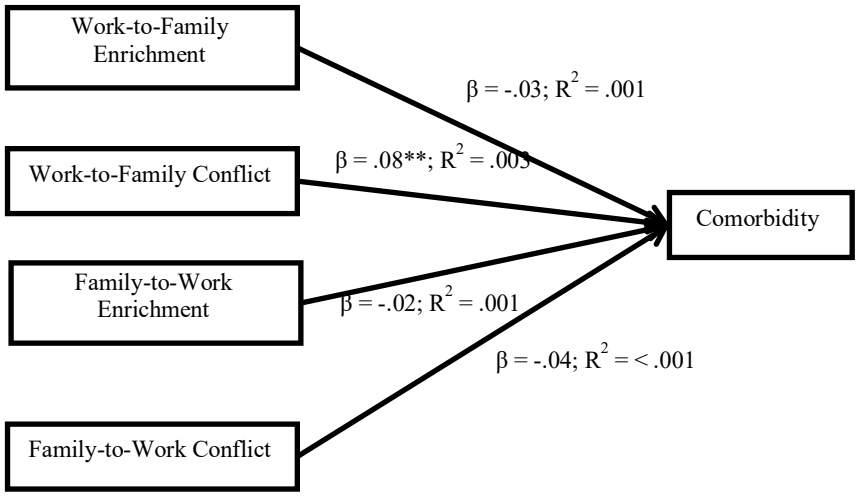
An excerpt from the final dataset for working status (Empl; PT = working for part-time, FT = working for full-time; no = not working for pay) and WTFC.

ID	Empl-2006	Empl -2008	Empl -2010	Empl -2012	Empl -2014	WTFC-2006	WTFC -2008	WTFC -2010	WTFC -2012	WTFC -2014
10394010	FT	FT	FT	FT			1.33		1.67	
10109030	PT	PT	PT	PT		2.33		2.00		
10645031	FT	FT	PT	PT			1.33		1.67	
15911021	FT					2.00				
77912040	PT	FT	FT	PT	FT	1.33		2.67		3.00
80339011		FT	FT	FT	FT		2.67		2.00	

Note. Empty cell means missing.
10394010, 10645031, and 80339011were selected to answer their work-family experiences in 2008 and 2012.
10109030, 15911021, and 77912040 were selected to answer work-family experiences in 2006, 2010, and 2012.

Figure 1. Study Design and Exclusion Flow Diagram.

2-A. Effects of work-family experiences on comorbidity



2-B. Effects of work-family experiences on disability

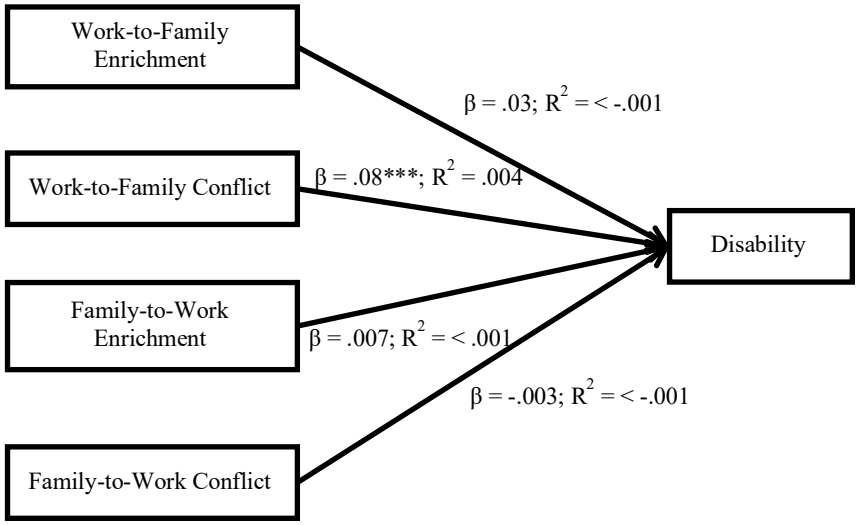


Figure 2. Effects of work-family experiences on comorbidity and disability. The results showed that work-to-family conflict is a significant predictor for comorbidity and disability. Both models adjusted for age at baseline (years), sex (female), education (years), and race (white) in the level 2 model and Time (0, 2, 4, 6, 8), depressive symptoms (0-8), living alone (yes), married (yes), income group (1-8), and employment status (full-time) in the level 1 model. Effect size was calculated based on the reduction of unexplained variance proposed by Snijders and Bosker (1994). ***p*< .01 ****p*< .001