SOCIAL RELATIONSHIPS AND DEPRESSION IN OLDER ADULTS

EXPERIENCING MARITAL TRANSITIONS: AN ANALYSIS

OF THE HEALTH AND RETIREMENT STUDY

by

Julia Tucker, B.S.

A thesis submitted to the Graduate Council of
Texas State University in partial fulfillment
of the requirements for the degree of
Master of Science
with a Major in Human Development and Family Sciences
May 2021

Committee Members:

Nicholas Bishop, Chair

Kaipeng Wang

Farya Phillips

FAIR USE AND AUTHOR'S PERMISSION STATEMENT

Fair Use

This work is protected by the Copyright Laws of the United States (Public Law 94-553, section 107). Consistent with fair use as defined in the Copyright Laws, brief quotations from this material are allowed with proper acknowledgement. Use of this material for financial gain without the author's express written permission is not allowed.

Duplication Permission

As the copyright holder of this work I, Julia Tucker, authorize duplication of this work, in whole or in part, for educational or scholarly purposes only.

DEDICATION

To Justin, Jaden, and Tennison. You have supported and encouraged me every step of the way. This thesis would not have been completed without you. Athena and Hulk, our precious pups, thank you for laying close to my desk on long working nights and making all zoom meetings a bit more exciting.

ACKNOWLEDGEMENTS

Throughout this almost two year process of completing my thesis I have received a great deal of support and guidance along the way. Without such, this body of work would not be possible.

I would first like to thank my advisor and committee chair, Dr. Nicholas Bishop. His expert knowledge was invaluable in formulating and successfully completing my thesis. Your patient support, instruction, and guidance has helped me grow my skills in all aspects of research.

I would like to thank my thesis committee, Dr. Farya Phillips and Dr. Kaipeng Wang. Thank you for serving on my committee, I know it takes time and effort. Your continuous feedback and expert input have shaped my thesis far past my expectations.

I would also like to thank all the faculty within the Human Development and Family Sciences program. From undergraduate through my graduate studies, the instruction and encouragement I received provided me with the building blocks and knowledge to complete this thesis.

In addition, I want to thank my family and friends who encouraged me, listened to me in times of stress, and helped me always maintain perspective. Lastly, Roxana Perez, you have a special place in my heart and completing this thesis with you as my best friend has been incredible.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Figure   **Page**

I. INTRODUCTION

The United States is experiencing drastic shifts in the age distribution of its population. It is projected that by the year 2030, adults aged 65 and older will account for 12% of the entire U.S. population (Roberts & Ogunwole, 2018). By 2050, adults over the age of 65 will account for 17% of the entire U.S. population (Roberts & Ogunwole, 2018). This increase of the aging population is largely due to aging of the baby boomer population, consisting of individuals born between 1946 and 1964 (Vespa, 2018). Accompanying an increase in older adults, there has been a shift in the marital biographies of the aging population, from 1990 to 2015, the rate of divorce among couples over 50 has risen from .5% to 1% of the entire married population in the U.S. (Stepler, 2017). From 1980 to 2018, the percent of divorced adults 65 and older increased from 5% to 15% (Stepler, 2017). While an increasing number of older Americans experience separation/divorce, widowhood is still very present. In 2015, 18.9% of all marital transitions experienced by women aged 50 and older were due to the death of a spouse (Brown & Wright, 2017). In 2018, 32% of all women (8.9 million) aged 65 and older were widows and 2.6 million men were widowers (Vespa, 2018). While the number of older adults in the U.S. increases and divorce and widowhood becomes more prevalent, there is increased need to identify the risks associated with grey divorce and loss of a spouse in order to create effective support systems and interventions.

People experience biological, physical, and environmental changes as they age, such as increased physical and mental disability and chronic disease (National Institute of Aging, 2020). Marital transition in older age can also bring rise to negative physical and mental health outcomes (Perrig-Chiello et al., 2015; Sasson & Umberson, 2014; Va et al.,

2011; Williams & Umberson, 2004). Marital transition can lead to new marriage, divorce, or widowhood. Marital transitions, such as divorce or widowhood, can lead to various negative health outcomes including physical symptoms such as a decline in functional health, an increase in depressive symptomology, and increased risk of mortality (Perrig-Chiello et al., 2015; Sasson & Umberson, 2014; Va et al., 2011; Williams & Umberson, 2004). Protective measures can support newly divorced or widowed individuals to avoid or minimize the risk of poor health outcomes (Bookwala et al., 2014; Kung, 2020; Utz et al., 2013; de Vries et al., 2014; Wu & Hart, 2002). Positive social relationships are a protective measure that are easily introduced, modifiable, and of low cost to both those providing and those receiving. Such relationships can exist in the form of physical contact, phone calls, and emails from one's spouse, children, family members, and friends (Chen & Feeley, 2013). Social support is often associated with positive feelings of emotional support that reduce loneliness and depression among aging populations (Ahn et al., 2016; Chen & Feeley, 2013). Recent studies have also found that social contact and support following widowhood can moderate the negative impacts following such a major life experience (Bookwala et al., 2014; de Vries et al., 2014).

Major life transitions among the aging population such as grey divorce or death of a spouse can have long lasting impacts on one's physical and mental health. Grey divorce and widowhood are associated with increased anxiety and depression, lowered life quality and satisfaction, and increased risk of mortality (Perrig-Chiello et al., 2015; Sasson & Umberson, 2014; Va et al., 2011; Williams & Umberson, 2004). The aim of this study was to identify the roles of social contact, social support, and social strain in moderating the relationship between changes in depression and marital transitions,

separation/divorce and widowhood, among the aging population. Further, this study investigated whether the relationship between social relationship measures, depression, and separation/divorce or widowhood would vary by sex.

Health Outcomes Due to Divorce

With life expectancy increasing in recent years (Xu et al., 2016), the rate of grey divorce is also increasing (Amato, 2010). These changes in marital biographies call for greater need to understand the negative outcomes which can follow such a life change for older adults. Specifically, physical health can be impacted due to recent divorce in aging populations. Negative physical health outcomes can include a decrease in self-rated and general health as well as increases in negative behaviors such as smoking, alcohol use, and poor diet (Lee, 2004; Prescott & Kendlar, 2001; Williams et al., 2004; Wu &Hart, 2002). While divorce can lead to physical health complications, it can also increase risk of mortality. Va et al. (2011) found that divorced or separated women, 65 years or older, had higher risk of mortality as well as cardiovascular disease mortality compared to their married counterparts. Both men's and women's risk of mortality more than doubled and remained high for the following 24 months after divorce (Brockmann & Klein, 2004). Mental health can also be harmed following marital dissolution, leading to chronic depression and anxiety that last years following divorce.

Marital changes, such as divorce, have been linked to negative mental health including prolonged feelings of sadness, disorientation, and anger (Canham et al., 2014; Kalmijn, 2017). Divorce at any age is linked to heightened levels of depression compared to continually married counterparts (Lorenz et al., 2016; Perrig-Chiello et al., 2014; Sbarra et al., 2014; Ye et al., 2018). Individuals who eventually divorced often reported

higher levels of depression prior to marital dissolution (Lorenz et al., 2016; Sbarra et al., 2014; Ye et al., 2018). Following divorce, depression peaked between 12 to 24 months (Lorenz et al., 2016; Perrig-Chiello et al., 2014; Sbarra et al., 2014; Ye et al., 2018). Sbarra and colleagues (2014) found that compared to their married peers, divorced individuals had higher rates of depression for a decade following divorce. While divorce across the lifespan is linked to increased risk of emotional distress and negative mental health outcomes, grey divorce encompasses unique characteristics that can lead to increased challenges. These characteristics include increased length of marriage, limited personal resources due to retirement, and minimal social capital (Gannon & Roberts, 2018; Kung, 2020; Perrig-Chiello et al., 2014). When accounting for length of marriage, specifically marriage that ends after at least 15 years, 22% of all divorced individuals reported both high depressive symptoms as well as low life satisfaction (Perrig-Chiello et al., 2014). In contrast to the understanding that bereavement results in the most extreme levels of mental distress, Ye and colleagues (2018) found that when measuring depression levels in 1987, 1992, and 2001, divorced individuals over the age of 50 reported the highest level of depression compared to their widowed and continuously married peers, both prior to and following divorce. Kamiya and colleagues (2013) found similar results with divorced individuals age 65 and older reporting higher levels of depression than both widowed and continually married individuals. This study also identified the unique challenges that divorced older adults face such as increased levels of depression and lowered life satisfaction. Lastly, this study identified a positive correlation between one's age at time of their divorce and increased risk of depression and lower life satisfaction (Kamiya et al., 2013).

While age plays a role in risk of poor outcomes, there are also differences in mental health outcomes based on sex. Previous studies have focused on the risk of depression following divorce among the aging population; however, studies that identify sex differences are not as robust. Compared to divorced men, divorced women exhibit the highest levels of depression (Kamiya et al., 2013). Wu and Hart (2002) identified similar outcomes with women reporting higher rates of depressive symptomology compared to divorced men and unmarried women (Wu & Hart, 2002). When identifying categorizations of outcome trajectories following divorce, women were found to make up most individuals who reported higher levels of depression and lower levels of life satisfaction (Perrig-Chiello et al., 2015).

Health Outcomes Due to Widowhood

Similar to divorced individuals, bereavement can impact one's physical and mental health as well as increase risk of early death (Kamiya et al., 2013; Sasson & Umberson, 2014; Utz et al., 2012; Va et al., 2011; Williams & Umberson, 2004). Bereavement and grief trajectories are heterogeneous in nature, being impacted by numerous factors such as the deceased spouse's health prior to death, financial status post loss, and sex of the surviving spouse (Carr, 2018; Galatzer-Levy & Bonanno, 2012; Sasson & Umberson, 2014). All of these factors can play a role in the duration of grief symptoms and variation in long term outcomes. Often, bereavement and the manifestation of grief are viewed as only emotional distress, but grief can also manifest physically (Williams & Umberson, 2004; Utz et al., 2012). When measuring immediate physical health impacts, bereaved individuals reported poor sleep, overall fatigue, loss of appetite, and general confusion ranging from 3-6 months (Utz et al., 2012). Individuals

suffering from grief due to the death of a spouse were also found to have higher levels of tobacco use and alcohol consumption compared to their married peers (Va et al., 2011). Williams and Umberson (2004) identified that self-rated health was found to diminish following the loss of a spouse and remained low for the following decade. Research has also identified an association between widowhood and increased risk of all-cause mortality. When examining cause specific mortality following the death of a spouse, both men and women experienced increased risk of death for 15 of 17 listed causes (Elwert & Christakis, 2008). Causes included, infection, sepsis, influenza or pneumonia, colon cancer, lung cancer, Alzheimer's or Parkinson's, ischemic heart disease, diabetes, congestive heart failure, accidents or serious fractures, and nephritis or kidney disease. Increased mortality risk due to the aforementioned causes lasted up to seven years after the loss of a spouse (Elwert & Christakis, 2008).

Bereavement is a dynamic experience that can impact multiple aspects of the bereaved individual's life and well-being, leading to increased levels of depression (Sasson & Umberson, 2014). Grief following the loss of a spouse is linked to numerous mental health difficulties including anxiety, loneliness, depression, and lowered life satisfaction (Chipperfield & Havens, 2001; Kalmijn, 2017). While age is positively associated with risk of negative mental health outcomes due to divorce, those who are widowed prior to 58 years of age and do not remarry experience immediate levels of depression at higher levels compared to those widowed in later life (Sasson & Umberson, 2014). Research identified that the majority of widowed older adults follow a similar trajectory regarding depressive symptomology. Bereaved individuals often experience a marked increase in depressive symptomology, with such symptoms peaking between 6

and 12 months following the loss, and often declining within 24 months (Carnelley et al., 1999; Galatzer-Levy & Bonanno, 2012; Jadhav & Weir, 2018, Xu et al., 2019). The expectancy or unexpected death of a spouse can also impact the surviving spouse's depression levels post death. When the death of a spouse is expected, possibly due to chronic illness or terminal diagnosis, the surviving spouse often experiences a return to pre-death depression levels within 2 years following the death (Carnelley et al., 1999; Carr, 2018; Sasson & Umberson, 2014). In contrast, individuals whose deceased spouse's death was unexpected experienced far greater and longer lasting depression compared to all other widowed individuals (Carr, 2018; Sasson & Umberson, 2014).

Research on mental health outcomes due to widowhood have only begun to explore the possibility of different mental health outcomes among men and women following widowhood. Several studies found that following the death of a spouse, women were found to experience a higher increase in depressive symptoms compared to men (Jadhav & Weir, 2018; Sasson & Umberson, 2014; Xu et al., 2019). Long-term grief trajectory studies found that men experienced lasting elevated levels of depression and diminished levels of life satisfaction even at six and 10 years following the death of their spouse while widowed women returned to depression levels similar to their married peers within this same time frame (Chipperfield et al., 2017; Jadhav & Weir, 2018, Kamiya et al, 2013).

Social Relationships and Depression Following Divorce or Widowhood

Understanding the unique challenges that members of the aging population face during marital transition requires researchers to identify and test the efficacy of possible protective measures which can help individuals avoid adverse health outcomes as well as

avoid long lasting risk of complicated grief and increased chronic illness (Kamiya et al., 2013; Sasson & Umberson, 2014; Williams & Umberson, 2004). Protective measures and support systems for divorced or widowed older adults can be provided in formal or informal capacities. One example of a more informal measure is social support (de Vries et al., 2014). Social support is often provided to a distressed individual in various functions and from different family or social circles (Thoits, 1986). This includes immediate family such as children or parents, neighbors, close friends, or coworkers. The functionality of the support provided can be instrumental, informational, and socioemotional (House, 1981). Instrumental support provides the individual with aid in completing tasks needed for day-to-day living. Informational support can be provided to inform the individual of resources, feedback, or advice. Socioemotional support provides the emotional connection and feedback, which can help ease the emotional stress one is experiencing.

In recent studies, positive social relationships have been identified as beneficial for older adults. Social support has been found to help increase the ability for older adults to manage their health, increase their life satisfaction, and protect against increased levels of depression (Kaya & Caydam, 2019; Mao & Han, 2018; Whitehead, 2018). Kaya and Caydam (2019) found that adults over the age of 72 who lived with or were supported by family experienced lower burden when managing their diabetes (Kaya & Caydam, 2019). Older adults who reported living with family or in a nursing home were more likely to report higher levels of life satisfaction compared to those living alone, and those who had high levels of social support exhibited better eating habits as well as lower levels of depression and anxiety (Mao & Han, 2018; Whitehead, 2018). Utilizing the Health and

Retirement Study's measures of social relationships and social strain for the aging population, numerous studies have identified how social support can provide a buffer against negative outcomes (Ahn et al., 2016; Chen & Feeley, 2014; Wang & Bishop, 2019). Ahn and colleagues (2016) found that positive spousal support lowered the levels of depression that individuals aged 65 and over often experienced due to the incidence of multiple chronic conditions such as diabetes, arthritis, heart conditions, and cancer. Chen and Feeley (2014) identified a negative correlation between social support from one's spouse or friends and feelings of loneliness in adults aged 50 and older, confirming that social support can have a positive impact on mental health.

Although limited, research has also identified the benefits of social relationships for individuals experiencing marital transitions (Bookwala et al., 2014; de Vries et al., 2014). While one study did include separation/divorce when assessing the moderating effects of social relationships on outcomes following such transitions, no significant association was found (Bookwala et al., 2014). Regarding widowhood, previous research found that frequent social contact and perceived support, especially from friends, was found to lower levels of depression through increased self-esteem and coping efficacy (de Vries et al., 2014). Following the death of a spouse, individuals who had familial support reported lower levels of somatic depression (Bookwala et al., 2014). Further research could provide greater understanding of the benefits of social relationships for older adults experiencing marital transition.

Limitations in Current Research and Hypotheses

Current research supports our understanding of the negative health impacts that the aging population can experience following marital transitions such as divorce or death

of a spouse but currently has failed to identify the unique needs of this population, especially within the first 24 months following transition (Sasson & Umberson, 2014; Ye et al., 2018). Existing studies have also strengthened our knowledge that social relationships can be beneficial for individuals over the age of 50. Social support has been linked to improved life satisfaction for the aging population (Chen & Feeley, 2014). Kaya and Camden (2019) found that positive social support helped older adults to better manage their chronic illness. The Health and Retirement Study's Leave Behind Questionnaire has been utilized to understand the role social support plays in lowering risk of food insecurity, loneliness, and depression caused by managing multiple chronic conditions (Ahn et al., 2016; Chen & Feeley, 2014; Wang & Bishop, 2019). Until now, no existing research has utilized the Health and Retirement Study's Leave Behind Questionnaire to measure social relationships as a buffer against negative mental health outcomes for older adults experiencing separation/divorce or death of a spouse. Understanding that marital transitions at an older age can have profound and long-lasting impacts, it is important to understand whether social relationships can minimize risk of negative mental health outcomes following such transitions.

Currently, research has primarily focused on the negative physical and mental health outcomes following marital transitions among the aging population. There is limited research available identifying effective resources and interventions for older adults experiencing marital transitions. This study aims to use the social relationships module in the Health and Retirement Study's 2012 Leave Behind Questionnaire to identify the possible role of social relationships in moderating the relationship between changes in depression and marital transitions among the aging population. Further, this

study will examine whether the buffering effect of social relationships on depression varies by sex.

H1: Individuals over the age of 50 who experience marital transition of separation/divorce will have a marked increase in depressive symptomology immediately after such transition.

H2: Individuals over the age of 50 who experience marital transition of death of a spouse will have a marked increase in depressive symptomology immediately after such transition.

H3: High social contact, high social support, and low social strain will weaken the relationship between change in depression and separation/divorce or widowhood, among individuals over the age of 50.

H4: The association between social relationship measures, depression, and separation/divorce or widowhood will vary by sex. I predict that men will experience a less rapid increase in depression compared to women experiencing the same marital transition with the same level of social relationship measures.

II. METHODS

Participants

Data came from the Health and Retirement Study (HRS). Sponsored by the National Institute on Aging, the HRS is a national biennial assessment panel created in 1992 by the University of Michigan. The HRS was created to examine longitudinal observations across multiple disciplines in the aging population. Individuals, 51 to 100+ years old including their spouses (regardless of age) were interviewed with questions covering economic status, family structure, health, and public and private support resources (Hauser & Weir, 2010). Since its inception, the HRS has identified additional cohorts and in 2010 included an expanded minority sample to address the previous under sampling of aging minority populations (Hauser & Weir, 2010). In 2004, a pilot study was conducted to measure psychosocial and lifestyle factors including work, well-being, personality, and social support (Smith et al., 2017). This pilot study was revised in 2006 and called the Leave Behind Questionnaire and has been included in the proceeding waves. At each wave, a 50% subsample is selected for an enhanced in person interview which includes the Leave Behind Questionnaire. This study examines the social relationships category of the Leave Behind Questionnaire from the 2012 wave, measuring respondent's frequency of contact with their friend and familial social network, perceived relationship quality, and social strains.

Beginning with the 2012 wave, the initial sample included 6,312 observations that had no missing data across any of the three social relationship measures. In order to limit the sample to only participants who reported partnered/married in 2012, individuals who reported their marital status as divorced, widowed, or never married were excluded from

the 2012 sample, resulting in a remaining sample of 4,188. Participants younger than 50

years of age were excluded (n = 161), leaving a sample size of 4,027. Finally, individuals

who had a missing 2014 marital status were excluded (n = 322), for a final sample of

3,705. This exclusion was conducted to limit missing data on the primary independent

variable, 2014 marital status.

Measures

Depression. Depression was measured using the Center for Epidemiological

Studies Depression scale short form, CES-D 8 (Quach & Burr, 2018). The questionnaire

asks individuals about the presence of emotions and behaviors that have persisted for two

weeks to 12 months prior to the interview. Respondents can answer "yes/no," to each

question. Questions that are referred to in the calculation of a respondent's CES-D 8

score as "negative," indicators are, "Have you felt depressed?", "Have you felt

everything you did required effort?", "Has your sleep been restless?", "Have you felt

lonely?", "Have you felt sad?", and "Have you felt like you could not get going?"

Questions referred to in the calculation of a respondent's CES-D 8 score as "positive,"

indicators are, "Have you been happy?", and "Have you enjoyed life?", The total CES-D

8 score is the sum of the six "negative" indicators (no = 0, yes = 1) minus the two

"positive" indicators (no = 0, yes = 1). The shortened version has been validated by

previous studies and found to not lose precision in identifying persistent depressive

symptoms (Briggs et al., 2018; Mojtabai & Olfson, 2004; Karim et al., 2015). Karim and

colleagues (2015) reported Cronbach's α as 0.84 for internal reliability of the CES-D 8

scale.

Marital transitions. The HRS collects data on marriage status at each biennial assessment. Answers for respondents to choose include *married*, *divorced*, *partnered*, *widowed,* and *never married* since previous wave of assessment. This study first aimed to identify change in depressive symptoms among individuals who experience divorce or widowhood, meaning only respondents who answered married or partnered in 2012 were included in the sample. To measure change in marital status from 2012 to 2014, the 2014 marital status variable was recoded to create three dichotomous variables, *married/partnered* (yes = 1, no = 0), *separated/divorced* (yes = 1, no = 0), or *widowed* (yes = 1, no = 0).

Social relationships. Social relationships were measured using three constructs: social contact, social support, and social strain. Social contact was measured using scales to rate frequency of social contact including, (1) three or more times per week, (2) once or twice per week, (3) once or twice per month, (4) every few weeks, (5) once or twice per year, or (6) less than once a year or never (Chen & Feeley, 2014). The HRS included several mediums that social contact can be received through including phone calls, emails, or in person. The frequency was rated separately for the individual providing the social contact, whether from children (not living in household), family/relatives, and friends. The scale for social contact shows relatively high internal consistency reliability (Cronbach's α = .71). Social support was measured using three questions to identify the level of positive social interaction the respondent had including "How much can you rely on them if you have a serious problem?", "How much do they understand how you feel about things?", and "How much can you share your worries with them?" These questions were all asked referencing the respondent's spouse/partner, children, family, and friends.

Response choices include (1) a lot, (2) some, (3) a little, (4) not at all. Social support shows high internal consistency reliability in the analytic sample (Cronbach's α = .84). The third social support measure, social strain, was designed to measure the negative social support present in a participant's life. Social strain was operationalized by creating four questions that respondents used to rate their frequency of occurrence including, "How often do they make too many demands?", "How much do they criticize you?", "How much do they let you down?", "How much do they get on your nerves?" Each question is asked referencing children (not living in the household), relatives, and friends. Response choices include (1) a lot, (2) some, (3) a little, or (4) not at all. Social strain shows high internal consistency reliability in the analytic sample (Cronbach's α = .85). To create three continuous measures of social contact, social support, and social strain, all individual variables were first reverse coded, indicating that higher scores equated to higher occurrence. Second, individual, reverse coded variables were summed to create social contact, social support, and social strain variables. Reliability tests were conducted in order to confirm the summed variables measured their intended social support measure. In completion of creating the three measures, social contact and social support both had a possible score range of 0 – 54 and social strain had a possible score range of 0 – 71. Individuals who did not report having any such support from children, friends, or relatives for any or all of the three social support measures were coded to report a score of zero. Prior to analysis, all three continuous variables were centered.

Sex. The HRS measures sex as female (0) and male (1). For analysis, sex was recoded as male (0) and female (1).

Control variables. Several measures were included as covariates during analysis

in order to minimize the possibility of a confounding variable impacting the relationship between the primary predictor and outcome measures. Age, length of respondent's current marriage, respondent's self-reported health, spouse's self-reported health, and household size were measured as continuous variables. Self-reported health was measured in the HRS by respondents describing their health as; (1) excellent, (2) very good, (3) good, (4) fair, and (5) poor. For analysis, self-reported health and spouse's self-reported health were reverse coded for higher scores to indicate higher quality of perceived health. Race/ethnicity were measured with two variables by the HRS. The first variable is a categorical measure with (1) White/Caucasian, (2) Black/African American, and (3) Other as possible responses. The second variable is a categorical measure with responses (0) Not Hispanic and (1) Hispanic. Race/ethnicity was recoded by combining both variables into one and then coded as four mutually exclusive dichotomous variables, White (reference), Black, Hispanic, and Other race/ethnicity. Education was measured in the HRS as a continuous variable, with respondents indicating the highest year of education with zero as the lowest score and 17+ as the highest score. Education was recoded into categories representing less than high school, high school diploma obtained (reference), and more than a high school education. Household income and assets were also included as control measures and were recoded to create quartiles. Chronic conditions are a predictor of depression in older adults (Ahn et al., 2016), thus a sum of chronic conditions was included as a covariate. Total score was calculated by first creating dichotomous variables of each chronic condition. Scores either indicate, "*yes*" (equals 1) that the respondent was currently diagnosed with the chronic condition or "*no*" (equals 0) the respondent did not currently have the chronic condition. All dichotomous

chronic condition variables were totaled. Chronic conditions included diabetes/high blood sugar, high blood pressure, cancer, lung disease, chronic heart issues such as heart attack or angina, stroke, psychiatric issues such as anxiety or nervousness, and arthritis. Lower cognitive function has also been linked to higher risk of depression for older adults and thus was included as a covariate (Gonzalez et al., 2018). Immediate word recall was measured in the HRS as a continuous variable. Participants are provided 10 words to recall right after exposure, with zero as the minimum score and 10 as the maximum score (Bugliari, 2019).

Analysis Strategy

First, descriptive statistics were used to summarize characteristics of participants included in the analytic sample (as presented in Table 1). Due to having multiple dichotomous and continuous independent variables predicting one continuous outcome variable, multiple regression was best suited for analysis. Multiple regression allowed for identification of relationships between predictor and outcome variables while controlling for all other variables (Agresti, 2018). Because CES-D 8 scores in 2012 were included as an independent variable, this analysis model allowed assessment of the association between all independent variables and change in depressive symptomology between 2012 and 2014. In total, 4 separate models were run while significant interactions were probed using regions of significance testing. Prior to all analyses, social contact, social support, and social strain variables were centered. Model 1 was performed to identify baseline associations between 2012 CES-D 8 scores and all predictor variables. Primary predictor variables of interest included variables measuring separation/divorce or widowhood in 2014, social contact, social support, and social strain after adjusting for all covariates.

Model 2 was estimated to examine the associations between transitions in marital status, the three social relationships measures, and change in CES-D 8 scores from 2012 to 2014 while controlling for all covariates. Model 3 was estimated to examine whether social contact, social support, or social strain moderated the association between marital transitions and change in depression scores. All main predictor variables, covariates and reference variables were the same as model 2, with the addition of social support measures by marital status interaction terms. In total, six interaction terms were created; social contact by separation/divorce, social support by separation/divorce, social strain by separation/divorce, social contact by widowed, social support by widowed, and social strain by widowed. To identify if any association between social contact, social support, or social strain and change in depression for the marital status separated/divorced group in 2014 was significantly different from zero, model 3 was run a second time using separation/divorce as the reference group. The variable married/partnered in 2014 and three interaction terms of married/partnered by each social relationship measures were included in modified model 3.

Finally, I used the Wald test of parameter constraints to identify whether the association between social relationships, marital transitions, and change in depression between 2012 and 2014 varied by sex. Six separate Wald tests were conducted, to estimate if any of the interaction terms varied by sex. For example, in the Wald test to determine whether the association between social contact and separation/divorce varied by sex, the following variables were allowed to vary across sex; separation/divorce, widowed, social contact, social support, social strain, and the six interaction terms of each social relationship measure by separated/divorced or widowed in 2014. Lastly, to

probe any significant two-way interactions or two-way interactions which varied by sex, regions of significance plots were created.

Missing Data. Maximum likelihood (ML) estimation was used to ensure inclusion of all 3,705 observations. When utilized properly, ML allows for estimates of nonresponses while controlling for nonresponse bias (Little & Rubin, 2002). All models were conducted using Mplus Version 8.1 software (Version 8.1; Muthen & Muthen, 2017).

III. RESULTS

Descriptive Statistics

Table 1 presents descriptive statistics for all measures including social

relationship variables. In 2014, the majority of the sample's participants reported

remaining married or partnered (94.5%, n = 3,501), as 1.9% reported becoming

separated/divorced (n = 69) and 3.6% reported becoming widowed between 2012 and

2014 (n = 135). The average depression score for the entire sample in 2012 was 1.07 (SE

= 1.71) and in 2014 the average CES-D 8 score was 1.17 (SE = 1.78). Participants who

remained married or partnered had a mean CES-D 8 score of 1.03 (SE = 1.67) in 2012

and a mean CES-D 8 score of 1.10 (SE = 1.72) in 2014, the lowest reported scores of all

marital categories at both times of measurement. Individuals who reported becoming

divorced/separated between 2012 and 2014 reported the highest depression score means

in both 2012 ($\bar{x}$ = 2.33, SE = 2.44) and 2014 ($\bar{x}$ = 2.43, SE = 2.64). Widowed individuals

reported an average CES-D 8 score of 1.54 (SE = 2.2) in 2012 and an average of 2.35 (SE

= 2.23) in 2014. All data for the three social relationship measures were recorded in 2012.

Both having a maximum score of 54, the average score for social contact was 31.33 (SE

= 9.09) and the mean score for social support was 42.01 (SE = 8.98). Social strain had a

maximum score of 71 and in 2012, the mean score was 39.54 (SE = 8.34). The mean age

in 2012 was 66.07 years of age (SE = 9.42). The sample had an even representation of

men (50%, n = 1853) and women (50%, n = 1852) in 2014. On average, participants

reported being married around 35 years (SE = 16.36). The average household size in

2012 was 2.54 individuals (SE = 1.14). Total average household income in 2012 was

around $86,000 (SE = $114,812). Total mean assets in 2012 was about $495,000 (SE =

$931,000). Respondents reported a mean score of 3.33 (SE = 1.03) for self-rated health in 2012 and a mean score of 3.21 (SE = 1.03) in 2014. Average spouse's self-rated health in 2012 was 3.28 (SE = 1.03). Respondents' mean score for immediate word recall in 2012 was 5.59 (SE = 1.53). Respondents reported an average of 2.01 chronic conditions (SE = 1.42). From the entire sample, 15.1% of respondents reported completing less than a high school education (n = 559), 31.9% reported obtaining a high school diploma (n = 1,183), and 52.5% reported having more than a high school education (n = 1,946). For race/ethnicity 73.3% of respondents were White (n = 2,717), 11.5% were Black (n = 425), 11.5% were Hispanic, and 3.1% were a race/ethnicity not described as White, Black, or Hispanic.

Main Effect Models

As reported in Table 2, model 1 was performed to identify any direct significant associations between 2012 CES-D 8 scores and the main independent variables and covariates. Both marital transitions, separated/divorced or widowhood, were positively associated with depressive symptomology. Separation/divorce between 2012 and 2014 was associated with a 1.06-unit increase (SE = 0.38, p = .005) in predicted 2012 CES-D 8 scores relative to individuals who remained partnered/married from 2012 to 2014. Becoming widowed between 2012 and 2014, was also associated with a 0.44-unit increase (SE = 0.22, p = .042) in predicted 2012 CES-D 8 scores, which was also relative to continuously partnered/married peers. Social contact and social support were negatively associated with 2012 depression scores for continuously partnered/married older adults. A one unit increase in social contact resulted in a 0.01-unit decrease (SE = 0.01, p = .046) in participant's predicted CES-D 8 scores in 2012. CES-D 8 scores

21

decreased by 0.02 (SE = 0.01, p = .009) for every unit increase in social support. Social strain was positively associated with 2012 depression scores, as a one unit increase in social strain was associated with a 0.02 increase (SE = 0.01, p < .001) in 2012 CES-D 8 scores. Four covariates were also identified to be significantly associated with 2012 CES-D 8 scores; respondent's self-rated health (b = -0.54, SE = 0.05, p < .001), chronic conditions (b = 0.14, SE = 0.03, p < .001), age (b = -0.03, SE = 0.01, p < .001), and individuals whose income was in the 4th quartile, compared to the 1st quartile reference (b = -0.24, SE = 0.11, p = .03).

Utilizing autoregressive multiple regression, model 2 (as reported in Table 2) was performed to estimate the direct association between change in CES-D 8 scores between 2012 and 2014, 2014 marital status, indicators of social relationships, and all covariates. In comparison to remaining partnered/married, divorce/separation was not significantly associated with change in depression. It was identified that compared to remaining married/partnered, becoming widowed between 2012 and 2014 was significantly associated with depression scores. Becoming widowed between 2012 and 2014 was associated with a 0.81-unit increase in depressive symptomology (p < .001). Social strain was the only measurement of social relationships significantly associated with a change in depression between 2012 and 2014, as a one-unit increase in social strain resulted in a 0.01-unit increase in CES-D 8 scores (SE = 0.01, p = .004). In addition, sex was significantly associated with change in depression. Specifically, compared to older adult males, older adult females had a predicted increase in CES-D 8 scores (b = 0.19, SE = 0.07, p = .006). Several covariates were also found to be significantly associated with change in depression between 2012 and 2014. Respondents self-rated health and number

of chronic conditions reported in 2012 were significantly associated in estimating change in depression between 2012 and 2014. As self-rated health increased by one unit, indicating a perception of better health, change in depression decreased by .14 units (SE = 0.045, p = .002). Respondent's reported chronic conditions were negatively associated with change in depression (b = 0.11, SE = 0.03, p < .001).

Social Relationship Measures and Marital Status Interactions

Model 3, reported in Table 2, tested whether the three measurements of social relationships moderated the association between marital status and change in depression between 2012 and 2014. In model 3, continuously partnered/married individuals were the reference group. When compared to their continuously married peers, two social relationship measures, social support, and social strain, were found to be significantly associated with change in depression for divorced or separated individuals. Relative to continuously married older adults, social support was positively associated with change in depression among separated/divorced older adults (b = 0.10, SE = 0.04, p = .020). Social strain was negatively associated with change in depression among separated/divorced individuals relative to their continuously partnered/married peers (b = -0.09, SE = 0.04, p = .022). Following completion of model 3, a modified version was estimated using separated/divorced 2014 marital status as the reference group. This required removing the variable which measured the marital status of separated/divorced in 2014 from analysis and then adding the variable which measured 2014 married/partnered status into the model. I also added interactions terms for social relationship measures and married/partnered while removing interaction terms for social relationship measures and separated/divorced. This model was completed to confirm

whether social support and social strain were significantly associated with change in depression for those who became separated/divorced between 2012 and 2014. In this model (not reported but available upon request), social support was positively associated with change in depression for divorced/separated participants ($b = 0.09$, SE = 0.04, $p = $ .032), but social strain was not significantly associated with change in depression for separated/divorced participants ($b = $ -0.07, SE = 0.04, p = .067). Regions of significance probing was conducted to better understand significant interactions from model 3. As shown in Figure 1, social support was positively associated with change in depression between 2012 and 2014 for separated/divorced older adults. While from low to moderate levels of social support there is no significance difference among partnered/married individuals and separated/divorced participants. Separated/divorced older adults who reported highest levels of social support in 2012 had estimated increases in depression between 2012 and 2014 compared to partnered/married older adults. As displayed in Figure 2, from moderate to the highest levels of social strain there was no significant difference of change in depression between partnered/married older adults and separated/divorced older adults. However, low to moderately low levels of social strain correspond to decreasing levels of depressive symptomology between 2012 and 2014 for separated/divorced older adults compared to partnered/married older adults.

Social Relationship Measures and Marital Status Interactions Varied by Sex

Wald test of parameter constraints were conducted to identify if there were sex differences in the interaction between marital status and social relationship measures when predicting change in depression. Only the main predictor variables, experiencing separation/divorce or widowhood between 2012 and 2014, social contact, social support,

and social strain, and interaction terms between marital status and social relationship measures were allowed to vary across sex. A total of six Wald tests (as presented in Table 3) were conducted to determine if allowing interaction estimates between social relationship measures and marital status to differ by sex led to significantly better model fit compared to models constrained to no model difference between sex. Interactions between social contact and widowhood (X^2 [1 df] = 0.26, p = 0.612), social support and widowhood (X^2 [1 df] = 0.04, p = 0.850), and social strain and widowhood (X^2 [1 df] = 0.10, p = 0.750) were not found to be significantly different for men and women. In addition, the interaction between social contact and separation/divorce (X^2 [1 df] = 0.00, p = 0.962), and social strain and separation/divorce (X^2 [1 df] = 0.08, p = 0.785) was not significantly different when allowed to vary across sex. The interaction between social support and separation/divorce was the only interaction to significantly vary by sex (X^2 [1 df] = 5.48, p = 0.019). However, this interaction was only significant for women (b = 0.23, SE = 0.07, p = 0.002) and not for men (b = 0.04, SE = 0.03, p = 0.170). Regions of significance probing was conducted to further understand this interaction. As shown in Figure 3, social support was positively associated with change in depression for women who reported becoming separated/divorced between 2012 and 2014. When social support was low to moderately low, separated/divorced older adult females had decreases in depression that were significantly lower compared to continuously partnered/married female peers reporting identical levels of social support. As reported in Figure 3, as social support increased, differences between separated/divorced females and continuously partnered/married females became non-significant.

IV. DISCUSSION

This study aimed to use the social relationship module of the Health and Retirement Study's Leave Behind Questionnaire to identify whether social relationships, operationalized as social contact, social support, and social strain, could moderate the relationship between changes in depression and widowhood or separation/divorce in community-dwelling older adults. A second goal was to determine if there were differences in the moderating effects of social relationships on change in depression following separation/divorce or widowhood between older adult men and older adult women. First, I hypothesized that individuals over the age of 50 who experienced separation/divorce or death of a spouse would have a marked increase in depressive symptomology from baseline depression scores within the first 24 months of such marital transition. I also hypothesized that higher levels of social contact and social support while social strain remained low would behave as a protective measure against increases in depression following marital transition. Lastly, I hypothesized there would be differences based on sex among social relationship measures, marital transition, and change in depression, and men would likely benefit more from the moderating effects of the social relationship measures compared to women. I found that separation/divorce in older adults was not associated with change in depression while widowhood in older age was significantly associated with an increase in depression. Two social relationship measures, social support and social strain, were found to moderate the relationship between change in depression and the marital transition separation/divorce. Social support was positively associated with change in depression for older adults who became separated/divorced while social strain was negatively associated with change in depression for the same

26

population. Lastly, results indicate that social support was positively associated with change in depression only for women who became separated/divorced between 2012 and 2014.

My first hypothesis was not confirmed by results from model 2 which indicated a non-significant association between separation/divorce and change in depression for older adults. These findings are in contrast to current research findings indicating that separation/divorce among older adults is associated with increased depression immediately following marital transition (Lorenz et al., 2016; Perrig-Chiello et al., 2014; Sbarra et al., 2014; Ye et al., 2018). Results from model 2 did confirm my second hypothesis as widowhood was significantly associated with increased levels of depressive symptomology within the first 24 months following the death of one's spouse. These findings are in agreement with previous studies indicating positive associations between depression and widowhood among older adults, specifically studies which measured depression at 6, 12, and 24 months after the death of one's spouse (Carnelley et al., 1999; Galatzer-Levy & Bonanno, 2012; Jadhav & Weir, 2018, Xu et al., 2019). Results from model 2 indicated that social support and social contact were also not directly associated with change in depression, these results are not in agreeance with current studies, indicating that social support and social contact often behave as protective measures against depression for older adults (Chen & Feeley, 2014; Kayima & Caydam, 2019; Mao & Han, 2018). Social strain was the only social relationship measure that was significantly associated with change in depression for older adults. While the direct association between social strain and depression among older adults is yet to be fully explored, my results are in support of previous studies which reported that social strain

was associated with declining well-being, as well as increased depression (Chen & Feeley, 2013; Ginzburg et al., 2021).

My third hypothesis was only partially supported by results from model 3. I predicted that the three social relationship measures would moderate the relationships between change in depression and marital transitions, separation/divorce and widowhood. First, in contrast to my hypothesis, results from model 3 indicated that none of the included social relationship measures significantly moderated the relationship between widowhood and change in depression. These results are somewhat in contrast to previous studies which found that widowed older adults who reported frequent social contact with family and friends also reported lower levels of depression compared to widowed older adults with less social support (Bookwala et al., 2014; de Vries et al., 2014). While some research has identified social relationships as a possible support system following bereavement, other studies have found that many individuals who become widowed often prioritize maintaining a continuous bond with the deceased spouse or partner following their death (Carr et al., 2014). This coping mechanism may look like a surviving spouse reminiscing over memories with the deceased spouse. It is possible that immediately following the death of a spouse, the surviving partner best copes relying on their own memories to find comfort, possibly minimizing the immediate impact of social relationships on one's mental health. Further, this might be even more apparent among older adults who become widowed due to having been married longer, hence having more time with the deceased to create more memories (Brown et al., 2004; Carr et al., 2014; Young & Foy, 2013). In addition, compared to young or middle-aged widowed individuals, older adults are more likely to have smaller social circles, requiring reliance

on personal coping through grief (Szabo et al., 2020; Vos et al., 2020).

Further interpretation of model 3 found that social support and social strain were both significantly associated with moderating the relationship between change in depression and separation/divorce among older adults. Following testing to further explore these associations, I found that older adults who reported becoming separated/divorced who also reported the highest levels of social support in 2012, had the highest estimated increases in depression between 2012 and 2014 (as presented in Figure 1). I surmise that older adults who reported high levels of social support in 2012 likely reported this due to their perceived positive support from partner/spouse, meaning their perceived marital quality was good. This notion is supported by previous studies indicating that couples who perceived their marital quality as high or positive, reported high marital interaction (Amato & Hohmann-Marriott, 2007). I predict that following marital dissolution, depression increased the most for these individuals due to the possible loss of the social relationship with one's spousal/partner as well as the loss of a relationship/marriage perceived as high quality. My findings are in agreeance with previous studies which identified that individuals with perceptions of high marital quality, happiness, and high marital interaction experienced the greatest increase in depression and greatest decrease in life happiness post separation/divorce (Amato & Hohmann-Marriott, 2007; Ye et al., 2018). As displayed in Figure 2 the significant interaction between social strain and separation/divorce when predicting change in depression supports a similar narrative as the moderating effect of social support. Individuals who reported the lowest levels of social strain in 2012 experienced significant increases in depression between 2012 and 2014 following marital dissolution due to

separation/divorce. In addition, as levels of social strain increased, the predicted change in depression decreased. These results also align with previous findings which indicated that individuals who reported higher levels of happiness prior to marital dissolution experienced the most significant increases in depression (Ye et al., 2018). Following the argument that marital quality prior to separation/divorce likely influenced the results of my analyses, I predict these individuals would report high marital quality and that their perceived low level of social strain was likely due to the perception of positive interactions. Amato and Hohmann-Marriott (2007) measured multiple factors to determine whether a marriage was considered "low distress" or "high distress". Couples who reported low conflict and high marital interaction were considered to be in a "low distress," marriage, making a connection between marital quality and levels of social support and social contact with one's partner. In conclusion, I believe older adults experiencing separation/divorce who report positive/higher marital quality would also report high levels of social support and low levels of social strain, though further research is required to identify this relationship.

Results from model 4 did not support my fourth hypothesis in which I predicted men would experience a less rapid increase in depression following marital transition, widowhood or separation/divorce, due to moderating effects of high social contact, high social support, and low social strain. The only interaction that was significantly different between men and women was the interaction between social support and separation/divorce. Upon review of the estimates that were separately estimated for men and women, social support moderated the association between separation/divorce and change in depression for women only. As displayed in Figure 3, the association between

social support and change in depression for separated/divorced older adult women was positive. Increasing social support resulted in more rapid increases in depression for women experiencing separation/divorce, although only low to moderately low levels of social support indicate change in depression for separated/divorced women that was significantly different from partnered/married women. Women who became separated/divorced after 2012 and reported low to moderately low levels of social support in 2012 had a predicted decrease in depression, while women who remained partnered/married had a predicted increase in depression at the corresponding levels of social support. I believe these results correspond with previous results in my study. I assert that both continuously partnered/married and separated/divorced older adult women who reported low social support in 2012 would also have reported low marital quality, further indicating that pre separation/divorce marital quality influenced the results of my study. In addition, I believe the predicted increase in depression for continuously partnered/married women at low levels of social support is influenced by their continuance of a marriage that was perceived as low quality. While further analysis is required to determine this relationship, a previous study conducted by Hawkins and Booth (2005) found that when comparing outcomes, life-satisfaction, psychological distress, self-esteem, and overall health, of individuals in "unhappy," marriages, those who remained married had poorer outcomes compared to those who left the "unhappy," marriage. I believe that these findings support the argument for future research focused on (1) the connection between marital quality and perceived levels of social support, social contact, and social strain pre and post separation/divorce and (2) the relationship between outcomes following separation/divorce and perceived marital quality,

specifically for older adults in order to best meet their needs.

Limitations

While findings from this study support the argument that social relationship measures play a key role in mental health outcomes for older adults following separation/divorce, there are limitations that should be acknowledged. First, the number of individuals sampled who became widowed between 2012 and 2014 or became separated/divorced between the same time frame were relatively small. Second, the number of waves included in this study are limited to only two, 2012 and 2014. This limits the ability to explore possible long-term moderating effects of social relationships on depression among older adults experiencing marital transition. Previous studies have found that older adults who experience divorce tend to report high levels of depression more than 5 plus years following marital dissolution (Lorenz et al., 2016; Perrig-Chiello et al., 2014; Sbarra et al., 2014; Ye et al., 2018). In addition, findings from this study support the notion that the moderating effects of social relationship measures on change in depression vary by marital status. For example, at the same levels of social support, the predicted change in depression for partnered/married older adults is negative while it is positive for separated/divorced older adults. Including more observations post marital transition could provide further insight into the relationship between social support, marital status, and change in depression. Due to the availability of additional waves following 2012 and 2014, I plan to explore including more waves in future studies. I also found two limitations within variables included in analysis. First, the HRS does not differentiate between partnered/married, or separated/divorce. Specifically, separation, applied in real life, can look very different than a finalized divorce as one could be

considered temporary versus permanent. I believe future studies which differentiate between separation and divorce will result in even greater understanding of the unique risk factors and needs for older adults experiencing such life transitions. During analyses all three support measures were operationalized as continuous measures. Future analysis including tertiles for each social relationship measure would allow for greater sensitivity in detection of possible non-linear relationships and identify possible thresholds at which each social relationship measure provide greatest impact on the association between marital transition and change in depression. Due to results throughout analyses, the ability to compare outcomes based on separation/divorce and widowhood were not supported as both in model 2 and model 3, only one of the two marital transitions indicated significant associations. Further investigation will be required to fully understand the similarities and uniqueness of older adults experiencing widowhood or separation/divorce. Lastly, I was unable to conduct analyses using separate missing data analysis which could have been beneficial in measuring significant associations and interactions.

Future Research

Despite the limitations of this study, the results advance our understanding of the initial impacts of social relationship measures on change in depression within the first 24 months following separation or divorce. These results highlight the importance to further explore the impact of marital quality on individual mental health outcomes following separation or divorce. Including perceived marital quality can provide understanding of influences (occurring prior to marital dissolution) on one's mental health outcomes following such marital transition, further informing how to support this population most

effectively. This study, in contrast to previous findings, did not identify any social relationship measures as moderators between the association of change in depression and widowhood (Bookwala et al., 2014; de Vries et al., 2014). Such findings support the argument that social relationships may not be sufficient as a buffering mechanism against increased levels of depression following widowhood and the need for future research which pursues identifying alternative protective measures for widowed older adults is necessary. Further, future research should aim to continue examination of the heterogenous nature of mental health outcomes among men and women following separation and divorce. These findings could enhance the specificity of resources and support provided to this population based on sex. Lastly, research which includes clinically established levels of low, optimal, and high social contact, social support, and social strain would be beneficial in informing future interventions which intend to increase positive social support while minimizing social strain following separation/divorce among older adults.

Clinical Implications

Findings from this study show that to best serve older adults experiencing marital transitions, caregivers, health care providers, and mental health professionals must acknowledge multiple factors impacting the individual's mental health. First, assessing perceived marital quality will allow a care provider to determine whether the individual is likely to exhibit acceptance and possible relief due to exiting a low-quality marriage versus someone who may experience prolonged levels of increased depression due to a perceived high-quality marriage. In addition, assessing levels of social contact, social support, and social strain from one's partner prior to such transition can also support a

provider in predicting possible outcomes of the individuals. This may look like a provider identifying an individual who perceived the support from the spouse/partner to have been positive and high contact, as this person may need increased resourced to rebuild social relationships outside of their ended relationship/marriage. Support measures, both positive and negative, following such transitions must also be assessed and considered when understanding the needs immediately following marital transition in order to support positive mental health outcomes for older adults having to transition from partnered/married to now separated/divorced. This could look like health care providers assessing whether the adult is in contact with family or friends as well as whether they perceive those around them to be positive support systems. Promoting positive support can look like guiding an individual through setting boundaries or increasing time with those they feel best comforted by.

Table 1.
Sample Descriptives

Continuous Measures	Total Sample (n=3,705)			Married (n=3,501)			Divorced (n=69)			Widowed (n=135)		
	N	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*
Age T1	3705	66.07	9.42	3501	65.88	9.33	69	61.65	8.81	135	73.16	8.88
CES-D 8 Score T1	3635	1.07	1.71	3434	1.03	1.67	69	2.33	2.44	132	1.54	1.94
CES-D 8 Score T2	3579	1.17	1.78	3383	1.10	1.72	69	2.43	2.64	127	2.35	2.23
Total Income (in $100,000)	3705	0.86	1.15	3501	0.88	1.17	69	0.77	0.67	135	0.47	0.42
Total Assets (in $100,000)	3705	4.95	9.31	3501	5.04	9.42	69	2.31	3.61	135	3.89	8.27
Length of current marriage (years)	3351	35.38	16.36	3181	35.41	16.14	50	20.11	11.62	120	40.92	19.77
Household Size	3705	2.54	1.14	3501	2.55	1.15	69	2.38	0.91	135	2.30	1.00
Respondent's self-rated health T1	3701	3.33	1.03	3497	3.34	1.02	69	2.91	1.11	135	3.06	1.04
Respondent's self-rated health T2	3703	3.21	1.03	3499	3.23	1.03	69	2.88	1.12	135	2.96	0.93
Spouse's self-rated health T1	3582	3.28	1.03	3395	3.33	1.01	62	2.81	1.14	125	2.23	1.12
Immediate word-recall score	3636	5.59	1.53	3435	5.62	1.52	69	5.26	1.59	132	5.09	1.64
Chronic Illness Score	3676	2.01	1.42	3473	2.00	1.41	69	1.87	1.41	134	2.51	1.40
Social Relationship Measures												
Social Contact	3705	31.33	9.09	3501	31.42	9.06	69	30.01	9.50	135	29.74	9.52
Social Support	3705	42.01	8.98	3501	42.08	8.93	69	39.99	9.71	135	41.14	9.77
Social Strain	3705	39.54	8.34	3501	39.63	8.27	69	40.23	10.69	135	36.95	8.37
Categorical Measures	*N*	*%*		*N*	*%*		*N*	*%*		*N*	*%*	
Sex												
Male	1853	50.00%		1778	50.80%		31	44.90%		44	32.60%	
Female	1852	50.00%		1723	49.20%		38	55.10%		91	67.40%	
Race												
White	2717	73.30%		2568	73.40%		48	69.60%		101	74.80%	
Black	425	11.50%		398	11.40%		10	14.50%		17	12.60%	
Hispanic	426	11.50%		403	11.50%		9	13.00%		14	10.40%	
Other	114	3.10%		111	3.20%		2	2.90%		3	2.20%	
Education												
Less than high school	559	15.10%		524	15.00%		10	14.50%		25	18.50%	
High school graduate	1183	31.90%		1102	31.50%		24	34.80%		57	42.20%	
More than high school	1946	52.50%		1858	53.10%		35	50.70%		53	39.30%	

Note. CES-D 8: Center for Epidemiological Studies Depression Scale 8. T1: Time 1, 2012. T2: Time 2 (2014).

Table 2.
CES-D 8 Scores Estimates

	Model 1: 2012 CES-D 8 Scores				Model 2: 2014 CES-D 8 Scores				Model 3: 2014 CES-D 8 Scores			
Main Predictor Measures	Estimate	S.E.	Est./S.E.	*p*	Estimate	S.E.	Est./S.E.	*p*	Estimate	S.E.	Est./S.E.	*p*
CES-D 8 Scores at T1					0.48	0.03	14.19	0.000	0.48	0.03	14.21	0.000
Separated or Divorced at T2	1.06	0.38	2.81	0.005	0.67	0.34	1.95	0.051	0.66	0.31	2.16	0.031
Widowed at T2	0.44	0.22	2.04	0.042	0.81	0.23	3.55	0.000	0.76	0.23	3.30	0.001
Sex	0.22	0.07	3.27	0.001	0.19	0.07	2.77	0.006	0.19	0.07	2.91	0.004
Social Relationship Measures												
Social Contact	-0.01	0.01	-2.00	0.046	-0.01	0.01	-1.82	0.069	-0.01	0.01	-1.43	0.152
Social Support	-0.02	0.01	-2.61	0.009	-0.01	0.01	-1.47	0.142	-0.01	0.01	-2.00	0.046
Social Strain	0.02	0.01	4.29	0.000	0.01	0.01	2.92	0.004	0.02	0.01	3.58	0.000
Covariates												
Age	-0.03	0.01	-5.04	0.000	0.00	0.01	-0.52	0.604	0.00	0.01	-0.41	0.686
Length of Marriage	0.00	0.00	-0.38	0.705	0.00	0.00	-0.97	0.332	0.00	0.00	-1.00	0.317
Household Size	0.01	0.04	0.16	0.877	0.02	0.03	0.54	0.590	0.02	0.03	0.53	0.594
Spouse's Self-Rated Health at T1	-0.08	0.04	-2.14	0.032	0.03	0.04	0.82	0.412	0.03	0.04	0.85	0.398
Respondent's Self-Rated Health at T1	-0.54	0.05	-11.98	0.000	-0.14	0.05	-3.08	0.002	-0.14	0.05	-3.14	0.002
Chronic Illness	0.14	0.03	4.69	0.000	0.11	0.03	3.82	0.000	0.11	0.03	3.73	0.000
Immediate Word Recall	-0.02	0.02	-0.95	0.340	-0.03	0.02	-1.36	0.175	-0.03	0.02	-1.54	0.123
Hispanic	-0.13	0.14	-0.97	0.330	0.07	0.13	0.59	0.552	0.08	0.13	0.67	0.506
Black	-0.11	0.12	-0.91	0.366	-0.07	0.11	-0.66	0.511	-0.06	0.11	-0.55	0.584
Other	0.26	0.21	1.25	0.211	0.00	0.25	-0.01	0.995	0.00	0.25	0.00	0.999
Less Than High School	0.25	0.14	1.84	0.066	0.14	0.11	1.28	0.200	0.14	0.11	1.26	0.208
More Than High School	0.05	0.08	0.60	0.552	0.08	0.07	1.18	0.240	0.08	0.07	1.19	0.234
Income Quartile 2	-0.05	0.12	-0.45	0.657	0.00	0.09	0.01	0.993	0.00	0.09	-0.04	0.965
Income Quartile 3	-0.19	0.11	-1.73	0.083	-0.06	0.09	-0.67	0.504	-0.06	0.09	-0.65	0.515
Income Quartile 4	-0.24	0.11	-2.16	0.031	-0.02	0.10	-0.24	0.810	-0.03	0.10	-0.26	0.798
Asset Quartile 2	-0.16	0.13	-1.22	0.223	-0.08	0.10	-0.81	0.419	-0.08	0.10	-0.81	0.419
Asset Quartile 3	-0.17	0.13	-1.27	0.203	-0.07	0.11	-0.60	0.546	-0.08	0.11	-0.73	0.464
Asset Quartile 4	-0.06	0.13	-0.49	0.628	-0.10	0.11	-0.91	0.362	-0.11	0.11	-1.04	0.299
Interaction Variables												
Social Contact by Separated/Divorce									-0.08	0.04	-1.95	0.052
Social Support by Separated/Divorce									0.10	0.04	2.33	0.020
Social Strain by Separated/Divorce									-0.09	0.04	-2.29	0.022
Social Contact by Widowhood									-0.01	0.03	-0.33	0.742
Social Support by Widowhood									0.03	0.03	0.85	0.395
Social Strain by Widowhood									-0.04	0.03	-1.18	0.236

Table 3.

Wald Test of Parameter Constraints

Support Measure by Marital Status	X^2	df	p
Social Contact by Widowhood	0.26	1	0.612
Social Support by Widowhood	0.04	1	0.850
Social Strain by Widowhood	0.10	1	0.750
Social Contact by Separation/Divorce	0.00	1	0.962
Social Strain by Separation/Divorce	0.08	1	0.785
Social Support by Separation/Divorce	5.48	1	0.019

Table 4.

Estimates of Change in Depression Between 2012 and 2014 by Sex

| Measures	Female				Male			
	Estimate	S.E.	Est./S.E.	*p*	Estimate	S.E.	Est./S.E.	*p*
CES-D 8 Score T1	0.48	0.03	14.28	0.000	0.48	0.03	14.28	0.000
Separated/Divorced T2	0.01	0.37	0.02	0.984	1.17	0.48	2.45	0.014
Widowed T2	0.68	0.31	2.20	0.028	0.95	0.30	3.17	0.002
Social Contact	0.00	0.01	-0.43	0.670	-0.01	0.01	-1.43	0.154
Social Support	-0.02	0.01	-2.60	0.009	0.00	0.01	-0.25	0.802
Social Strain	0.02	0.01	2.90	0.004	0.01	0.01	1.98	0.048
Social Contact by Separation/Divorce	-0.08	0.06	-1.34	0.181	-0.08	0.06	-1.43	0.154
Social Support by Separation/Divorce	0.23	0.07	3.11	0.002	0.04	0.03	1.37	0.170
Social Strain by Separation/Divorce	-0.08	0.03	-2.53	0.011	-0.06	0.06	-0.99	0.322
Social Contact by Widowhood	-0.02	0.04	-0.45	0.650	0.01	0.04	0.27	0.791
Social Support by Widowhood	0.04	0.05	0.83	0.410	0.03	0.04	0.76	0.450
Social Strain by Widowhood	-0.04	0.04	-0.83	0.405	-0.06	0.04	-1.57	0.117
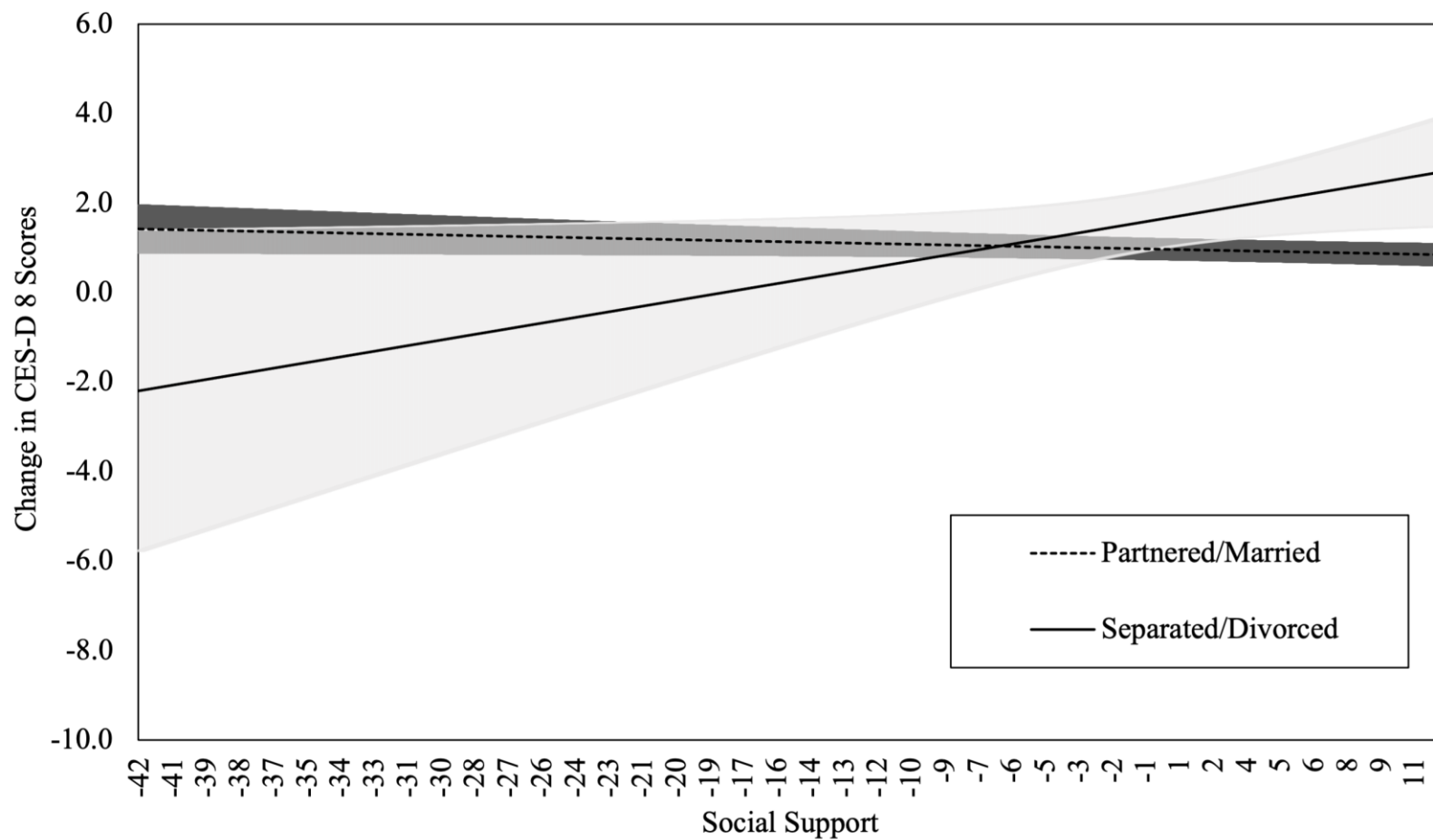
Figure 1. Change in CES-D 8 Scores by Social Support for Partnered/Married and Separated/Divorced Individuals, 2012 - 2014
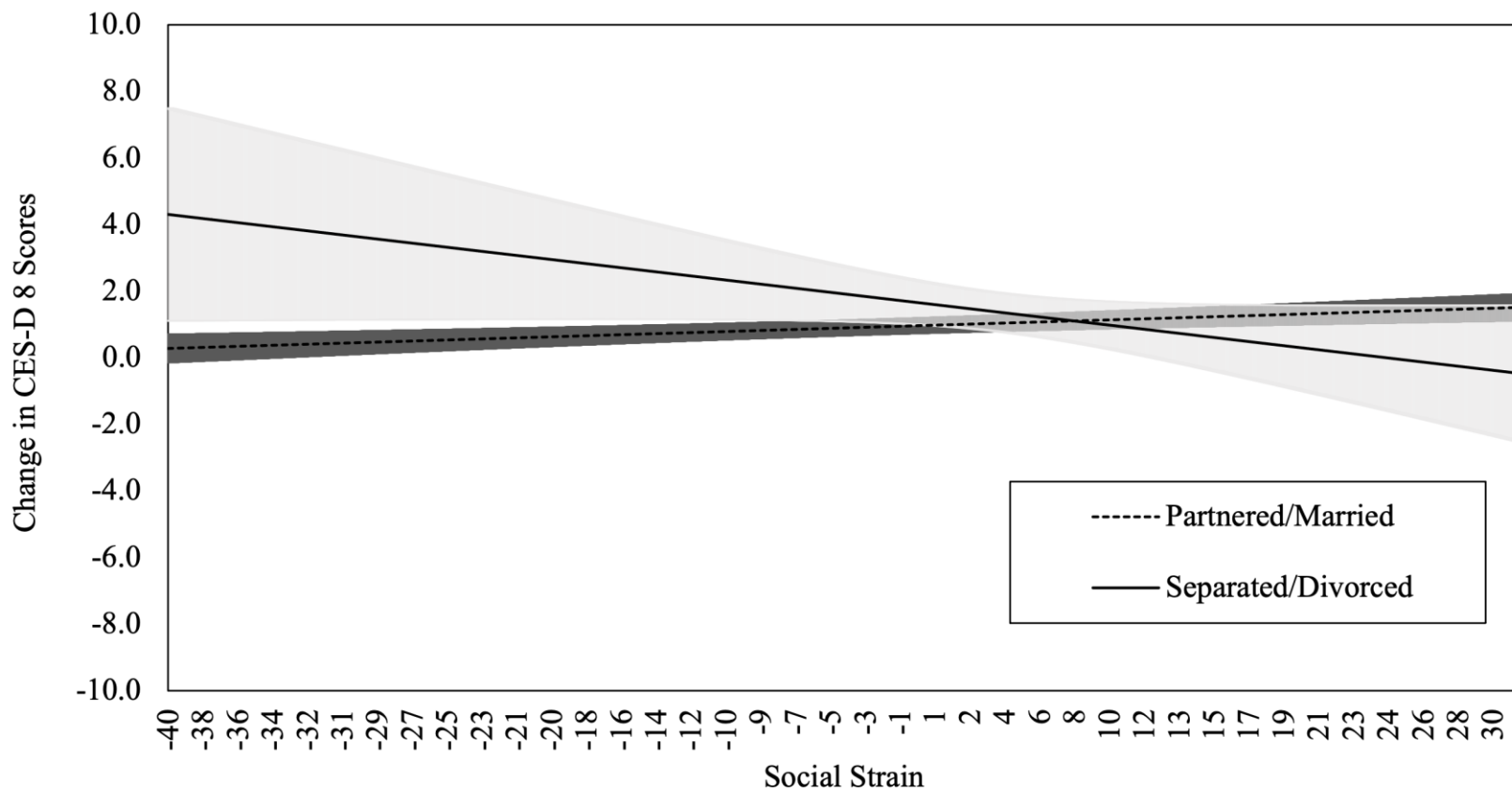
Figure 2. Change in CES-D 8 Scores by Social Strain for Partnered/Married and Separated/Divorced Individuals, 2012 - 2014
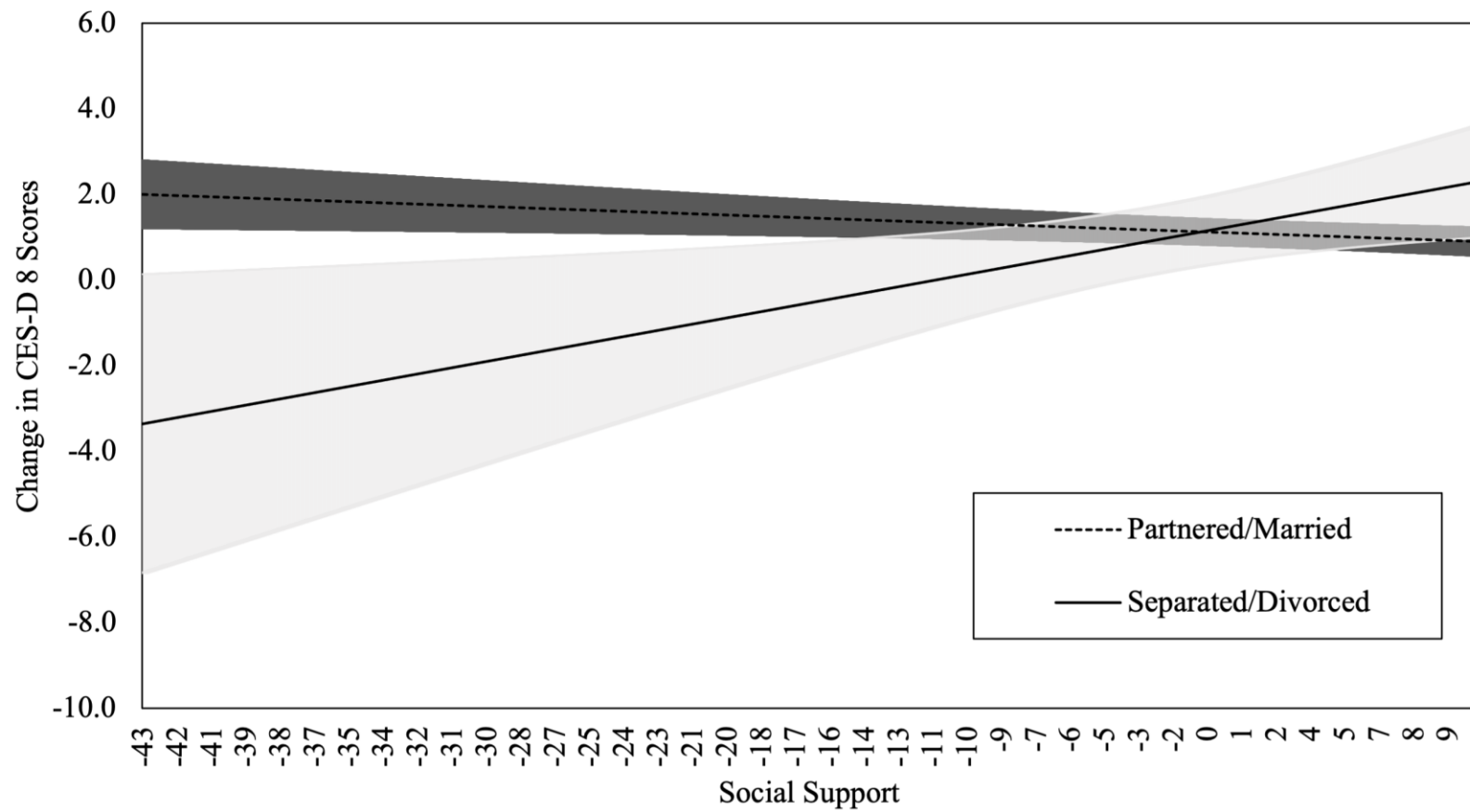
Figure 3. Change in CES-D 8 Scores by Social Support for Partnered/Married and Separated/Divorced Women, 2012 - 2014

REFERENCES

Ahn, S., Kim, S., & Zhang, H. (2016). Changes in depressive symptoms among older adults with multiple chronic conditions: Role of positive and negative social support. *International Journal of Environmental Research and Public Health, 14*(1), 16. 10.3390/ijerph14010016

Allison, P. (1990). Change scores as dependent variables in regression analysis. *Sociological Methodology, 20*, 93-114. doi:10.2307/271083

Agresti, A. (2018). *Statistical methods for the social sciences*. Pearson.

Amato, P. R. (2010). Research on divorce: Continuing trends and new developments. *Journal of Marriage and Family, 72*(3), 650-666. 10.1111/j.1741-3737.2010.00723.x

Amato, P. R., & Hohmann-Marriott, B. (2007). A Comparison of high- and low-distress marriages that end in divorce. *Journal of Marriage & Family, 69*(3), 621–638. https://doi-org.libproxy.txstate.edu/10.1111/j.1741-3737.2007.00396.x

Bookwala, J., Marshall, K. I., & Manning, S. W. (2014). Who needs a friend? Marital status transitions and physical health outcomes in later life. *Health Psychology, 33*(6), 505-515. 10.1037/hea0000049

Briggs, R., Carey, D., O'Halloran, A., Kenny, R., & Kennelly, S. (2018). Validation of the 8-item Centre for Epidemiological Studies Depression Scale in a cohort of community-dwelling older people: Data from the Irish Longitudinal Study on Ageing (TILDA). *European Geriatric Medicine*, *9*(1), 121-126. 10.1007/s41999-017-0016-0

Brockmann, H., & Klein, T. (2004). Love and death in Germany: The marital biography

    and its effect on mortality. *Journal of Marriage and Family, 66*(3), 567-581.

    10.1111/j.0022-2445.2004.00038.x

Brown, S. L., Nesse, R. M., House, J. S., & Utz, R. L. (2004). Religion and emotional

    compensation: Results from a prospective study of widowhood. *Personality &*

    Social Psychology Bulletin, 30(9), 1165–1174. 10.1177/0146167204263752

Brown, S. L., & Wright, M. R. (2017). Marriage, cohabitation, and divorce in later

    life. *Innovation in Aging, 1*(2), igx015. 10.1093/geroni/igx015

Bulgiari, D., Campbell, N., Chan, C., Hayden, O., Hayes, J., Hurd, M. (2018). RAND

    HRS longitudinal file 2014 (V2) documentation. Labor & Population Program,

    RAND Center for the Study of aging. Retrieved from

    https://www.rand.org/content/dam/rand/www/external/labor/aging/dataprod/randh

    rs1992_2016v2.pdf

Canham, S. L., Mahmood, A., Stott, S., Sixsmith, J., & O'Rourke, N. (2014). Til divorce

    do us part: Marriage dissolution in later life. *Journal of Divorce &*

    Remarriage, 55(8), 591-612. 10.1080/10502556.2014.959097

Carnelley, K. B., Wortman, C. B., & Kessler, R. C. (1999). The impact of widowhood on

    depression: Findings from a prospective survey. *Psychological Medicine, 29*(5),

    1111-1123. 10.1017/S0033291799008971

Carr, D., Freedman, V. A., Cornman, J. C., & Schwarz, N. (2014). Happy marriage,

    happy life? Marital quality and subjective well-being in later life. *Journal of*

    Marriage and Family, 76, 930-948.

Carr, D. (2018). Mental health of older widows and widowers: Which coping strategies

    are most protective? *Aging & Mental Health, 24*(2), 291-299.

    10.1080/13607863.2018.1531381

Chen, Y., & Feeley, T. H. (2014). Social support, social strain, loneliness, and well-being

    among older adults. *Journal of Social and Personal Relationships, 31*(2), 141-

    161. 10.1177/0265407513488728

Chipperfield, J. G., & Havens, B. (2001). Sex differences in the relationship between

    marital status transitions and life satisfaction in later life. *The Journals of*

    Gerontology. Series B, Psychological Sciences and Social Sciences, 56(3), 176-

    186. 10.1093/geronb/56.3.P176

de Vries, B., Utz, R., Caserta, M., & Lund, D. (2014). Friend and family contact and

    support in early widowhood. *The Journals of Gerontology. Series B,*

    Psychological Sciences and Social Sciences, 69(1), 75-84. 10.1093/geronb/gbt078

Elwert, F., & Christakis, N. A. (2008). The effect of widowhood on mortality by the

    causes of death of both spouses. *American Journal of Public Health*

    (1971), 98(11), 2092-2098. 10.2105/ajph.2007.114348

Galatzer-Levy, I. R., & Bonanno, G. A. (2012). Beyond normality in the study of

    bereavement: Heterogeneity in depression outcomes following loss in older

    adults. *Social Science & Medicine, 74*(12), 1987-1994.

    10.1016/j.socscimed.2012.02.022

Gannon, B., & Roberts, J. (2018). Social capital: Exploring the theory and empirical

    divide. *Empirical Economics, 58*(3), 899-919. 10.1007/s00181-018-1556-y

Ginzburg, S. L., Lemon, S. C., Romo, E., & Rosal, M. (2021). Social support and strain

and emotional distress among Latinos in the northeastern United States. *BMC

Psychology,* 9(1), 1–9.

Hauser, R. M., & Weir, D. (2010). Recent developments in longitudinal studies of aging

in the united states. *Demography, 47*, 111-130. 10.1353/dem.2010.0012

Hawkins, D. N. & Booth, A. (2005). Unhappily Ever after: Effects of long-term, low-

quality marriages on well-being. *Social Forces, 84*(1), 451–471.

Jadhav, A., & Weir, D. (2018). Widowhood and depression in a cross-national

perspective: Evidence from the United States, Europe, Korea, and China. *The

Journals of Gerontology. Series B, Psychological Sciences and Social

Sciences, 73*(8), e143-e153. 10.1093/geronb/gbx021

Kalmijn, M. (2017). The ambiguous link between marriage and health: A dynamic

reanalysis of loss and gain effects. *Social Forces, 95*(4), 1607-1636.

10.1093/sf/sox015

Kamiya, Y., Doyle, M., Henretta, J. C., & Timonen, V. (2013). Depressive symptoms

among older adults: The impact of early and later life circumstances and marital

status. *Aging & Mental Health, 17*(3), 349-357. 10.1080/13607863.2012.747078

Karim, J., Weisz, R., Bibi, Z., & ur Rehman, S. (2014). Validation of the eight-item

Center for Epidemiologic Studies Depression Scale (CES-D) among older

adults. *Current Psychology, 34*(4), 681-692. 10.1007/s12144-014-9281-y

Kaya, U., & Caydam, O. (2019). Association between social support and diabetes burden among elderly patients with diabetes: A cross-sectional study from turkey. *Saudi Journal of Medicine and Medical Sciences, 7*(2), 86-92. 10.4103/sjmms.sjmms_44_18

Kung, C. S. J. (2020). Health in widowhood: The roles of social capital and economic resources. *Social Science & Medicine, 253*. https://doi.org/10.1016/j.socscimed.2020.112965

Lee, S. (2004). Effects of marital transitions on changes in dietary and other health behaviours in US women. *International Journal of Epidemiology, 34*(1), 69-78. 10.1093/ije/dyh258

Lorenz, F. O., Wickrama, K. A. S., Conger, R. D., & Elder, G. H. (2016). The short-term and decade-long effects of divorce on women's midlife health. *Journal of Health and Social Behavior, 47*(2), 111-125. 10.1177/002214650604700202

Mao, X., & Han, W. (2018). Living arrangements and older adults' psychological well-being and life satisfaction in China: Does social support matter? *Family Relations, 67*(4), 567-584. 10.1111/fare.12326

Mojtabai, R., & Olfson, M. (2004). Major depression in community-dwelling middle-aged and older adults: Prevalence and 2- and 4-year follow-up symptoms. *Psychological Medicine, 34*(4), 623-634.

Muthén, L.K. and Muthén, B.O. (1998-2017). Mplus User's Guide. Eighth Edition. Los Angeles, CA: Muthén & Muthén

Perrig-Chiello, P., Hutchison, S., & Morselli, D. (2015). Patterns of psychological

    adaptation to divorce after a long-term marriage. *Journal of Social and Personal*

    Relationships, 32(3), 386-405. 10.1177/0265407514533769

Prescott, C. A., & Kendler, K. S. (2001). Associations between marital status and alcohol

    consumption in a longitudinal study of female twins. *Journal of Studies on*

    Alcohol, 62(5), 589-604. 10.15288/jsa.2001.62.589

Quach, L. T., & Burr, J. A. (2018). Arthritis, depression, and falls among community-

    dwelling older adults: Evidence from the health and retirement study. *Journal of*

    Applied Gerontology, 37(9), 1133-1149.

    https://doi.org/10.1177/0733464816646683

Sasson, I., & Umberson, D. J. (2014). Widowhood and depression: New light on sex

    differences, selection, and psychological adjustment. *The Journals of*

    Gerontology. Series B, Psychological Sciences and Social Sciences, 69(1), 135-

    145. 10.1093/geronb/gbt058

Sbarra, D. A., Emery, R. E., Beam, C. R., & Ocker, B. L. (2014). Marital dissolution and

    major depression in midlife. *Clinical Psychological Science, 2*(3), 249-257.

    10.1177/2167702613498727

Smith, J., Ryan, L. H., Fisher, G. G., Sonnega, A., & Weir, D. R. (2017). HRS

    Psychosocial and Lifestyle Questionnaire 2006–2016. Ann Arbor, Michigan:

    Survey Research Center. *Institute for Social Research, University of Michigan*.

Stepler, R. (2017, March 9). Led by Baby Boomers, divorce rates climb for America's

    50+ population. Retrieved from https://www.pewresearch.org/fact-

    tank/2017/03/09/led-by-baby-boomers-divorce-rates-climb-for-americas-50-

    population/

Sweet, S. A., & Grace-Martin, K. (2012). *Data analysis with SPSS: A first course in*

    applied statistics. Boston: Pearson Allyn & Bacon.

Szabo, A., Kok, A. A. L., Beekman, A. T. F., & Huisman, M. (2020). Longitudinal

    examination of emotional functioning in older adults after spousal

    bereavement. *The Journals of Gerontology. Series B, Psychological Sciences and*

    Social Sciences, 75(8), 1668–1678.

Thoits, P. A. (1986). Social support as coping assistance. *Journal of Consulting and*

    Clinical Psychology, 54(4), 416-423. 10.1037/0022-006X.54.4.416

Utz, R. L., Caserta, M., & Lund, D. (2012). Grief, depressive symptoms, and physical

    health among recently bereaved spouses. *The Gerontologist, 52*(4), 460-471.

    10.1093/geront/gnr110

Utz, R. L., Swenson, K. L., Caserta, M., Lund, D., & deVries, B. (2013). Feeling lonely

    versus being alone: Loneliness and social support among recently bereaved

    persons. *The Journals of Gerontology. Series B, Psychological Sciences and*

    Social Sciences, 69B(1), 85-94. 10.1093/geronb/gbt075

Va, P., Yang, W., Nechuta, S., Chow, W., Cai, H., Yang, G., Gao, S., Gao, Y., Zheng,

    W., Shu, X., & Xiang, Y. (2011). Marital status and mortality among middle age

    and elderly men and women in urban Shanghai. *PloS One, 6*(11), e26600.

    10.1371/journal.pone.0026600

Vespa, J. (2018, March 13). The U.S. joins other countries with large aging populations. Retrieved from https://www.census.gov/library/stories/2018/03/greying-america.html

Vos, W. H., Boekel, L. C., Janssen, M. M., Leenders, R. T. A. J., & Luijkx, K. G. (2020). Exploring the impact of social network change: Experiences of older adults ageing in place. *Health & Social Care in the Community, 28*(1), 116–126.

Wang, K., Bishop, N.J. (2019). Social support and monetary resources as protective factors against food insecurity among older Americans: Findings from a health and retirement study. *Food Security, 11*, 929–939. https://doi.org/10.1007/s12571-019-00945-8

Williams, K. & Umberson, D. (2004). Marital status, marital transitions, and health: A sexed life course perspective. *Journal of Health and Social Behavior, 45*(1), 81-98. 10.1177/002214650404500106

Wu, Z., & Hart, R. (2002). The effects of marital and nonmarital union transition on health. *Journal of Marriage and Family, 64*(2), 420-432. 10.1111/j.1741-3737.2002.00420.x

Ye, M., DeMaris, A., & Longmore, M. A. (2018). Role of marital quality in explaining depressive symptoms after marital termination among older adults. *Marriage & Family Review, 54*(1), 34-49. 10.1080/01494929.2017.1284703

Young, W. B. & Foy, S. L. (2013). The Influence of meaning-making after spousal loss on trajectories of psychological distress. *Society and Mental Health, 3*(3), 187–202. 10.1177/2156869313491273

Xu, J., Murphy, S. L., Kochanek, K. D., & Arias, E. (2016). Mortality in the united states, 2015. *NCHS Data Brief,* (267), 1-8. https://doi.org/10.3322/caac.21332

Xu, J., Wu, Z., Schimmele, C. M., & Li, S. (2019). Widowhood and depression: A longitudinal study of older persons in rural China. *Aging & Mental Health, 24*(6), 1-9. 10.1080/13607863.2019.1571016